



Kolmakova O.,
Andriianova O.

INCREASE OF COMPETITIVENESS OF THE CONSTRUCTION ENTERPRISES IN THE CONDITIONS GEOPOLITICAL TRANSFORMATIONS

Об'єктом дослідження є конкурентоспроможність будівельних підприємств в умовах геополітичних трансформацій. Однією з невирішених проблем в цій сфері є оцінка впливу зовнішніх факторів на розвиток будівельних підприємств. Існуючі методики оцінки конкурентоспроможності досить об'ємні та трудомісткі і зосереджені більше на економічному розвитку будівельних підприємств та їх конкурентів. І майже не враховують геополітичних змін в зовнішньому середовищі будівельного підприємства. Саме тому авторами, за допомогою використання матричного методу, було розроблено експрес-методику, яка дозволяє оцінити вплив геополітичних трансформацій на рівень конкурентоспроможності. В ході дослідження також використовувалися методи кластерного аналізу, що дозволило розділити області України на групи за ознаками інтенсивності будівництва та впливу руху внутрішньо переміщених осіб. Перша група – найбільша з високим розвитком будівельної галузі, друга – найменша з високим розвитком будівельної галузі та високою кількістю внутрішньо переміщених осіб та третя – з низьким розвитком будівельної галузі та низькою кількістю внутрішньо переміщених осіб. Також у процесі дослідження використовувався метод матричного підходу, що дозволив отримати інформацію стосовно сильних і слабких сторін будівельного підприємства в аспекті геополітичних трансформацій, а головне оцінити, як з тими ж геополітичними ризиками справляються інші підприємства. Запропонована методика підійде для проведення поточного контролю. Застосування даної методики на підприємстві не несе додаткових витрат для будівельного підприємства. Аналіз спрощений, оснований на загальнодоступних даних, може виконуватися економістом в стандартному пакеті програмного забезпечення: Excel, може також стати частиною аналітичних пакетів програмного забезпечення, що використовуються на підприємстві. У порівнянні з аналогічними відомими методиками оцінки конкурентоспроможності за допомогою запропонованого аналізу оцінюється конкурентоспроможність саме в аспекті геополітичних трансформацій. Це дозволяє будівельним підприємствам визначити рівень захисту від впливу факторів зовнішнього середовища.

Ключові слова: оцінка конкурентоспроможності, будівельні підприємства, геополітичні трансформації, кластерний аналіз.

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1. Introduction

One of the features of the activities of a construction company is the location, the region. The nature and features of construction are determined by the level of development of the region. Globalization and increased mobility of people opens up new opportunities for construction enterprises: the volume of customers, their solvency, is not limited to the locality for construction enterprises. Geopolitical transformations in the region, related areas, in the country and in the world form the socio-economic conditions for enterprises. Accordingly, the competitiveness of a construction company directly depends on the competitiveness of the region in the state, and the state in the world. There is a need for new mechanisms for managing competitiveness, taking into account changes in the political system and international borders. Therefore,

it is relevant to study the competitiveness of enterprises in the aspect of geopolitical transformations.

2. The object of research and its technological audit

Within the framework of the object, the part that determines *the subject of research* is highlighted: the methods and methodologies for assessing the competitiveness of an enterprise. Classical methods for assessing the competitiveness of a construction company contain a unit for assessing changes in the external environment. One of the most problematic places in this block is the lack of consideration of globalization processes and geopolitical changes. That is why, in modern conditions, it is advisable to introduce into this block a component of the assessment of geopolitical transformations of the state and world level.

3. The aim and objectives of research

The aim of research is development of a methodology for assessing geopolitical transformations and its impact on the competitiveness of construction enterprises in Ukraine.

To achieve this aim it is necessary to solve the following objectives:

1. To analyze the impact of geopolitical transformations on the activities of construction enterprises.
2. To conduct a cluster analysis of the regions of Ukraine.
3. To build an express methodology for assessing the competitiveness of a construction company in geopolitical conditions.

4. Research of existing solutions of the problem

Scientists began to deal with competitiveness issues relatively recently. The initial methods, methods of analysis of industries and competitors were founded by the author of [1]. These techniques are general and universal for any enterprise.

The construction industry has quite specific features and classic methods of increasing competitiveness and does not give high results. Among the main directions of solving this problem is detailing the competitiveness management system [2]. As well as the use of specific industry methods and techniques [3, 4]. But in these studies, the specifics of construction enterprises are not considered.

The work [5] is devoted specifically to increasing the competitiveness of a construction enterprise, but the main factors influencing competitiveness are the costs and lowering (internal factors). In [6], the construction industry is considered as an object of investment, and accordingly, not only internal factors, but also external ones are already included to assess competitiveness, geographical factors are added (the analysis was carried out for UK enterprises).

In none of these works, when creating a mechanism to increase the competitiveness of an enterprise, geopolitical changes were taken into account. European scientists have been observing a rather intensive process of geopolitical transformations over the past thirty years (the collapse of the Soviet Union, the creation of the European Union, military conflicts in Georgia, Moldova and other countries). In [7], it is proved that geopolitical processes not only affect the development of certain regions, but also contribute to socio-economic shifts. However, this study is general and the effects of such landslides on enterprises in specific industries are not shown.

The works [8, 9] give a clear vision of the influence of geopolitical transformations on the competitiveness of enterprises, but small, medium-sized enterprises of trade and enterprises of the oil complex are considered.

The authors of [10] consider enterprises as an outstanding part of the region's resources, and the socio-economic situation of the region as one of the main factors for increasing the enterprise's competitiveness. This statement can be considered from the side of geopolitical transformations.

As a result, it can be earned that scientists agree that there must be geopolitical factors in the system for increasing the competitiveness of enterprises. The lion's share of research to solve this problem is carried out in

the field of industry, trade, agriculture, etc., there are few local studies in the construction industry, and there are no studies from the perspective of the influence of geopolitical factors on the competitiveness of the construction industry.

5. Methods of research

The application of cluster analysis allows to divide the regions of Ukraine into groups according to the signs of construction intensity and the impact of the number of internally displaced persons (IDPs). Graphical and tabular methods are used to clearly summarize the statistical material of the work. And the application of the matrix method makes it possible to obtain information about the strengths and weaknesses of the construction company in the aspect of geopolitical transformations, and most importantly, to evaluate how other enterprises cope with the same geopolitical risks. The abstract logical method is used to generalize and formulate the conclusions of the study.

6. Research results

The main geopolitical factors in the classical sense include the geographical position of the country (access to the seas and oceans). The activities of a construction company are affected by the landscape; the presence of mountains, deserts, swamps; river communications; soil, climate, vegetation, minerals (availability of building materials). Also in the political and economic aspect, the size of the territory, the length of the borders and their configuration are important; the number and composition of the population living in the country, etc.

If purely geographical factors affect the nature and complexity of construction work, then the number and composition of the population living in the region forms the main client base. Politically economic changes in adjacent regions are often the reason for the intensification of migration flows, and, accordingly, the reason for the change in the qualitative and quantitative composition of clients. According to the Ministry of Social Policy during 2014–2018, the total IDP number from the occupied territories of Ukraine amounted to 1516.237 thousand people [11, 12]. 166 329 people were registered in Kyiv, and 126 990 people in the Kharkiv region, 74 390 people in the Dnipropetrovsk region, 66 032 people in the Kyiv region and 40 876 people in the Odesa region. Let's examine how such a geopolitical change in Ukraine affected the volume of work performed by construction enterprises (Table 1).

Having built the graph, it can be noted that there is a fairly close relationship between the growth rate of construction for 2014–2018 and the IDP arrival in the region (Fig. 1).

It becomes clear that those regions in which the ATO (anti-terrorist operation) continues have conflicting indicators. For further analysis, the author excludes the Donetsk and Luhansk regions from the sample. Based on the exhausted sample, the authors conducted a cluster analysis of the influence of individual geopolitical factors on the activities of construction enterprises (Fig. 2).

After conducting cluster analysis, the authors identified 4 groups of regions (Table 2).

Table 1

Output data for the analysis of the influence of geopolitical transformations on the activities of construction enterprises

Regions of Ukraine	The growth rate of construction products 2014/2018 (Tp)	The number of registered internally displaced persons 100 thousand people (IDP)
Vinnitsia	4.86338	0.11434
Volyn	2.86239	0.02590
Dnipropetrovsk	3.06784	0.74391
Donetsk	1.25945	5.52695
Zhytomyr	3.61780	0.07280
Zakarpattia	4.18464	0.03670
Zaporizhzhia	3.03594	0.56049
Ivano-Frankivsk	3.38970	0.03571
Kyiv	3.31194	0.66032
Kirovohrad	3.25752	0.06629
Luhansk	0.77650	2.92746
Lviv	3.56579	0.10888
Mykolaiv	2.82505	0.08638
Odesa	3.51979	0.40876
Poltava	1.77496	0.25488
Rivne	1.57545	0.03267
Sumy	1.82721	0.11176
Ternopil	2.30959	0.02123
Kharkiv	3.26403	1.26990
Kherson	2.76159	0.14298
Khmelnyskyi	3.51877	0.06547
Cherkasy	2.86775	0.11326
Chernivtsi	1.75957	0.02427
Chernihiv	1.72320	0.08417
Kyiv City	2.85120	1.66329

Note: calculated and compiled by the authors based on data [10, 11]

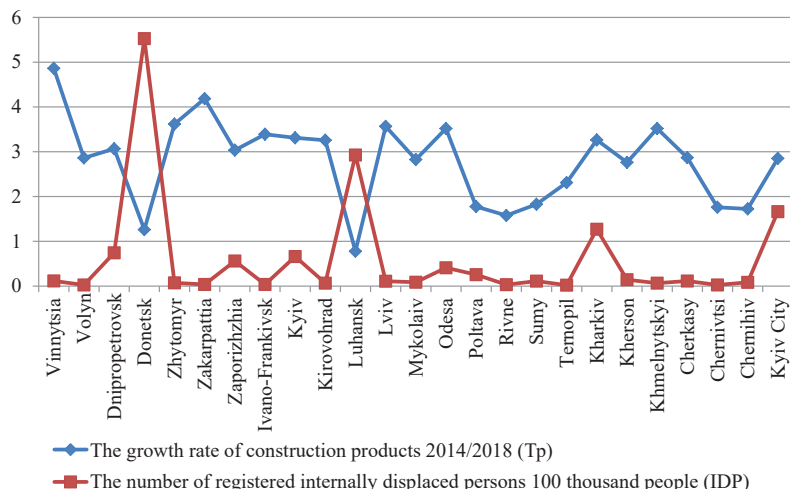


Fig. 1. The impact of geopolitical transformations on the activities of construction enterprises

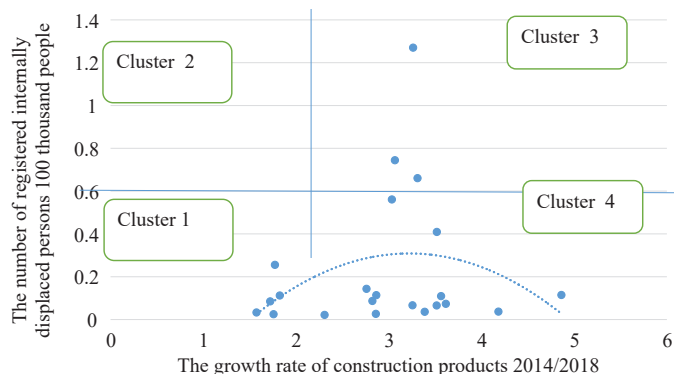


Fig. 2. Cluster analysis of the regions of Ukraine in terms of the ratio of the number of internally displaced persons (IDPs) and the growth rate of construction enterprises

Table 2

Characteristics of selected clusters

Cluster	Intervals	Characteristics
Cluster 1. Regions: Poltava, Chernivtsi, Chernihiv, Rivne, Sumy, Ternopil	Growth rate: 0–2.5 IDP: 0–0.7 The growth rate of production and migration flows are quite low	Located at a distance from the conflict zone, but almost all are borderline
Cluster 2	Growth rate: 0–2.5 IDP: 0.7–1.4 There is not a single area in which there would be a large number of IDP migration flows and a low level of growth in the volume of the construction industry	Has no characteristics
Cluster 3. Regions: Dnipropetrovsk, Kharkiv, Kyiv	Growth rate: 2.5–5 IDP: 0.7–1.4 The high level of IDP migration flows has led to an increase in construction volumes	Large, densely populated, high levels of domestic regional product, are close to the conflict zone
Cluster 4. Regions: Vinnytsia, Volyn, Zhytomyr, Zakarpattia, Zaporizhzhia, Ivano-Frankivsk, Cherkasy, Khmel-nitskiy, Kherson, Kirovohrad, Lviv, Mykolaiv, Odessa	Growth rate: 2.5–5 IDP: 0–0.7 The distance from the conflict zone reduces IDP migration flows and increases the investment attractiveness of the region	Medium and small, sparsely populated, medium and low levels of domestic regional product, are far into the conflict zone

Based on the analysis, three groups of regions are identified (Fig. 3):

1. The first group of regions and the most with stable development of the construction sector (high growth rate) and remoteness from the conflict zone, low IDP growth (cluster 4).

2. The second group of regions is quite small with a low level of development of the construction sector and a small IDP amount (cluster 1).

3. The third group includes only three regions (the largest in Ukraine) with a high level of growth and a high number of IDP (cluster 3).

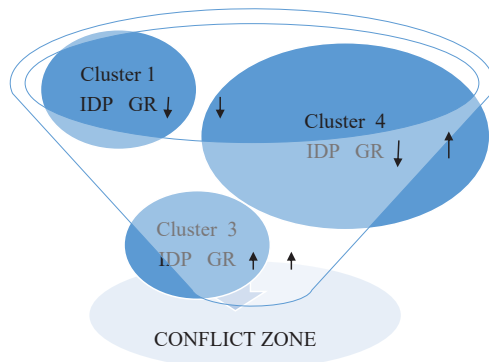


Fig. 3. The influence of the proximity of the conflict zone on the work of construction enterprises

The proximity of the ATO zone (Dnipro, Kharkiv, Kyiv) led to the displacement of the maximum IDP number and caused an increase in the volume of construction work (demand creates supply) with government intervention through the financing of social housing.

A sufficiently safe distance from the ATO zone allows investors to invest in construction even without a massive increase in demand.

Certain regions that are at a fairly large distance have low construction growth rates. That is, this geopolitical transformation does not affect the construction industry or affects indirectly in these areas. Therefore, when assessing competitiveness, it is necessary to use other indicators in this block.

The successful functioning of the enterprise in the market requires the need for regular monitoring of its

competitiveness. This allows to identify the strengths and weaknesses of the enterprise, to identify its potential and existing geopolitical threats and, accordingly, to maximize the competitiveness policy.

To assess the impact of geopolitical transformations on the competitiveness of a construction company, it is necessary to develop a list of indicators characterizing this influence. Based on the studies, it can be noted that the main indicator of the company's activity in the aspect of competition is its volume of construction. It should be noted that the second aspect of the statistical determination of the size of the enterprise is the number of employees. Introducing the geopolitical component, the authors chose a comprehensive indicator – the rating of the region. This indicator includes geographical, political and economic factors. That is why for the express analysis the following indicators were selected (Table 3):

1. The ratio of the growth rate of the volume of construction of the enterprise and the growth rate of the volume of industry products.
2. The ratio of the growth rate of construction workers and the growth rate of workers in the construction industry.
3. The ratio of the rating of the enterprise to the rating of the region.

Table 3

Initial data for the express analysis of the competitiveness of a construction company in 2018 in Kharkiv (Ukraine)

Indicators	«Trust Zhytlobud-1» PLC	«Zhytlobud-2» LLC	«Avantazh» LLC	Kharkiv region
Construction growth rate	1.91	3.20	1.8	1.015
Employees (staff) growth rate	1.29	1.13	1.08	1.12
Company rating and region rating [13]	230	208	158	168

The list of indicators can be expanded in each case.

To assess competitiveness, the use of the matrix method is proposed. Matrix analysis methods are based on linear and vector-matrix algebra and are used to study complex and multidimensional structures. The areas of application of the matrix method as a method of economic analysis

are diverse, but the method is most widely used for a comparative assessment of the activities of various systems (enterprises, structural divisions, etc.).

The algorithm for applying the matrix method to assess the competitiveness of an enterprise is shown in Fig. 4.

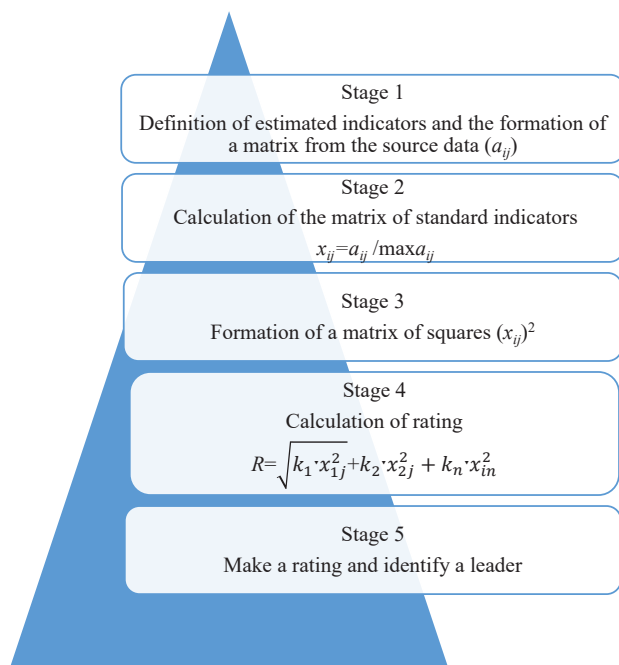


Fig. 4. Algorithm for assessing competitiveness by the matrix method

As a result of comparative analysis, the rating of the systems under consideration is determined. Let's consider the algorithm for applying the matrix method.

Stage 1. Determination of estimated indicators and the formation of the initial data matrix a_{ij} , that is, a table where the numbers of the systems ($i=1, 2, \dots, n$) are shown in rows and the numbers of indicators in columns ($j=1, 2, \dots, m$) (Table 4).

Stage 2. In each column, the maximum element is determined, which is taken as a unit. Then all the elements of this graph a_{ij} are divided by the maximum element of the $\max a_{ij}$ reference system, and a matrix of standardized coefficients x_{ij} is created (Table 4).

Stage 3. All elements of the matrix are squared. If the significance of the indicators that make up the matrix is different, then each indicator is assigned a weight coefficient k , which turns out to be expert.

The rating score for each system is determined by the formula:

$$R = \sqrt{k_1 \cdot x_{1j}^2 + k_2 \cdot x_{2j}^2 + \dots + k_n \cdot x_{nj}^2}$$

In the case under consideration, all coefficients are equivalent, therefore, let's take k for 1.

Stage 4. The received rating estimates R_j are placed in decreasing or increasing order, depending on the economic content of the indicators making up the rating (Table 5).

According to the results of assessing competitiveness by the matrix method, the first place in the ranking is taken by the company «Zhytlobud-2» LLC, it is a direct competitor to «Trust Zhytlobud-1» PLC in the struggle for primacy in the construction market of Kharkiv and its region. This technique provides only a comparative group assessment. It is intended to determine how enterprises cope with geopolitical changes. Geopolitical changes do not depend on the activities of enterprises and their impact on all enterprises should be the same. However, if the activities of certain construction companies have deteriorated and there are no others, this is a sign that the competitiveness of enterprises (in which economic conditions are deteriorating) is low, and other enterprises have been able to adapt to changing environmental conditions. Accordingly, in the future, enterprises should focus on this component of competitiveness. If the deterioration has occurred at all construction enterprises, then geopolitical changes are a challenge for all enterprises and the solution to this problem should be brought to the regional or even state level.

Table 4

Competitiveness baseline matrix

Company	The ratio of the growth rate of the volume of construction of the enterprise and the growth rate of industry products	The ratio of the growth rate of workers of a construction company and the growth rate of workers in the construction industry	Ratio of enterprise rating to region rating
«Trust Zhytlobud-1» PLC	1.88	1.15	1.37
«Zhytlobud-2» LLC	3.15	1.01	1.24
«Avantazh» LLC	0.56	0.84	0.69

Note: the maximum values of indicators are highlighted in gray

Table 5

Matrix of squares and rapid analysis results

Company	Construction growth rate	Growth rate of employees (staff)	Rating of an enterprise to a rating of a region [13]	R	Rating place
«Trust Zhytlobud-1» PLC	0.356201	1	1	1.53	2
«Zhytlobud-2» LLC	1	0.771342	0.819223	1.61	1
«Avantazh» LLC	0.3136	0.7056	0.4761	1.22	3

7. SWOT analysis of research results

Strengths. The strengths of the proposed express analysis are in determining the place of the enterprise in the ranking of competitors in the context of geopolitical transformations. An express analysis allows to determine whether the enterprise is «coping» in the face of uncertainty and how this happens in comparison with other enterprises in this industry. The analysis clearly shows how competitors «cope» with the same threats that the enterprise in question faces. The peculiarity of these threats is that it is impossible to influence them directly and they are the same for all market participants.

Weaknesses. The weaknesses of the express analysis are a rather limited list of indicators characterizing geopolitical transformations and directly affect the enterprise. Most often, these indicators act indirectly, through socio-political changes. According to the authors, this is not so much a drawback of the methodology as a part that should be further developed.

Opportunities. The specification and formalization of the list of indicators for express analysis is a further development of the proposed methodology.

Application of the methodology will allow to verify how geopolitical transformations affect the activities of enterprises in a particular industry and what place the analyzed enterprise occupies in the ranking of enterprises.

The technique is a universal mechanism for assessing competitiveness; this technique is suitable for any construction enterprises. It can be modified for any enterprises, any industry, any country, subject to the specification of the list of indicators, the preparation of a specialized list.

Using this technique at the enterprise does not incur additional costs. The analysis is quite simple and can be performed by an economist in a standard software package: Excel.

Threats. An analogue of the proposed methodology is the mechanisms and systems for assessing the competitiveness of an enterprise. These systems and mechanisms are quite complex, detailed and take into account almost all factors of influence on the activities of the enterprise. But the proposed express technique allows to quickly assess the competitiveness of the enterprise, its dependence on geopolitical conditions.

The simplicity of the technique allows to use it for routine monitoring without laborious calculations.

8. Conclusions

1. During the analysis of the influence of geopolitical transformations on the activities of construction enterprises, the dynamics of the volume of construction work and the IDP number in each region of Ukraine, respectively, are examined and compared.

2. In the course of the cluster analysis of the regions of Ukraine, they are divided into four clusters, and it is also shown that:

- proximity of the ATO zone does not have a negative impact directly on the development of construction (except for areas of the ATO zone itself);
- IDP movement through social subsidies and the growth in demand for housing have allowed to increase the volume of construction in three regions of Ukraine;

– a relatively safe distance allows regions to actively develop (and most of them);

– there are regions (usually borderline) in which the development of construction has almost stopped over the past five years.

3. To conduct ongoing monitoring of the impact of geopolitical transformations on the construction company, an express methodology for assessing its competitiveness has been built. This express method allows to quickly assess the competitiveness of an enterprise, its dependence on geopolitical conditions and quickly respond to possible threats.

References

1. Porter, M. E. (1998). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 397.
2. Ivanov, I. N. (2019). *Clustering As An Effective Tool For Increasing The Competitiveness Of Industrial Enterprises*. doi: <http://doi.org/10.15405/epsbs.2019.03.28>
3. Bielik, P., Rajčániová, M. (2012). Competitiveness analysis of agricultural enterprises in Slovakia. *Agricultural Economics (Zemědělská Ekonomika)*, 50 (12), 556–560. doi: <http://doi.org/10.17221/5248-agricecon>
4. *Determinants of cost-competitiveness in tradable sectors* (2014). doi: http://doi.org/10.1787/eco_surveys-prt-2014-graph15-en
5. SHOP FLOOR COST REDUCTION (2006). *Industrial Competitiveness Cost Reduction*, 3–5. doi: http://doi.org/10.1007/1-4020-4350-3_1
6. Multinational Enterprises, Industrial Restructuring and Competitiveness: A UK Perspective (2002). *Global Capitalism, FDI and Competitiveness*. doi: <http://doi.org/10.4337/9781843767060.00018>
7. Transformations in Central Europe between 1989 and 2012: geopolitical, cultural, and socioeconomic shifts (2013). *Choice Reviews Online*, 51 (2), 51–1123. doi: <http://doi.org/10.5860/choice.51-1123>
8. Barclay, L. A. A. (2006). The Competitiveness of Local Manufacturing Firms of Small, Less-Developed Countries in an increasingly Liberalized Trading Environment. *Transformations in Global Governance*. doi: <http://doi.org/10.4337/9781847203151.00020>
9. Yakovlev, P. (2018). Nafta 2.0: Trade Equivalent of Geopolitical Transformations. *Perspectives and Prospects. E-Journal*, 3 (15), 71–85. doi: <http://doi.org/10.32726/2411-3417-2018-3-71-85>
10. Smachylo, V., Khalina, V., Kolmakova, O., Ustilovska, A. (2019). Adaptation of Enterprises to Continuous SocioEconomic Changes in a Region. *SHS Web of Conferences*, 67, 06047. doi: <http://doi.org/10.1051/shsconf/20196706047>
11. *State Statistics Service of Ukraine*. Available at: <http://www.ukrstat.gov.ua/>
12. *Dynamics of changes in migration from the occupied territories of Ukraine*. Available at: <https://www.slovovidilo.ua/2018/09/05/infografika/suspilstvo/dynamika-zmin-mihracziyi-okupovanyx-terytorij-ukrayiny>
13. *Rating of regions of Ukraine*. Available at: <http://www.visnuk.com.ua/uk/publication/100008442-reyting-regioniv-ukrayini>

Kolmakova Olena, PhD, Associate Professor, Department of Economics, Kharkiv National University of Civil Engineering and Architecture, Ukraine, ORCID: <http://orcid.org/0000-0003-0908-5445>, e-mail: andrianovalesia@gmail.com

Andriianova Olesia, Department of Economics, Kharkiv National University of Civil Engineering and Architecture, Ukraine, ORCID: <http://orcid.org/0000-0001-9413-9932>, e-mail: andrianovalesia@gmail.com