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## **INTEGRATED EVALUATION OF BUSINESS ENVIRONMENT OF UKRAINIAN REGIONS: PRACTICAL ASPECT**

In the article, the author applies method, based on the calculation of the integral index of business environment development, which is the integrated assessment of the Ukrainian business environment in the regional context. The integrated development index is a derivative, resulting from the parameters layout of various elements of the business environment – economic (business, financial, communication), legal, political, social, informational, environmental, innovation environment. As a result, it gives the opportunity to get the most objective characteristic of the business climate of a certain territory (in our case, a region or group of regions).

**Keywords:** business environment, integral estimation, index, development level, regional view.

**Formulation of the problem.** Ukraine is a large territory and a very diverse country in the cultural and mental aspects of doing business in different regions. The assessment of the business environment has not only theoretical but also practical value and is associated with the need to develop a country's territorial development policy, the starting point of which is zoning of the territory (which will form the basis of the Strategic Map formation of the territorial development of Ukraine and the allocation of "business escalation zones").

**Analysis of recent research and publications.** Features and regularities of the business environment functioning in different countries of the world are reflected in the works of such foreign scientists as Ott Ursula<sup>1</sup>, F. von Hayek<sup>2</sup>, A. Chukhno<sup>3</sup>, etc. The business environment formation in the context of the development of the information environment studied by S. Scharlett<sup>4</sup>, O. Finagina<sup>5</sup>. The business environment was viewed through the prism of cultural-mental shifts by R. Lewis<sup>6</sup>. Modern authors such as I. Mazur<sup>7</sup>, I. Voronchak<sup>8</sup> and others complement and reveal the outlined perspective.

**Setting objectives.**

**The purpose of the article is to assess the level of the business environment development of the regions of Ukraine.** The obtained results will allow obtaining a quantitative criterion for regional differentiation in order to verify the economic, innovation, ecological, social policies, outlining the scope of targeted financing of regions, and clusters that are created not by branch but territorial basis.

**Description of the main results of the study.** In the previous studies, the author proposed and justified the 8-stage algorithm for monitoring the business environment of Ukraine in a regional context<sup>9</sup>.

<sup>1</sup> Ott Ursula, F. (2011). The Influence of Cultural Activity Types on Buyer-Seller Negotiations: A Game Theoretical Framework for Intercultural Negotiations. *International Negotiation*, 16, 427-450.

<sup>2</sup> Хайек, Ф.А. (1992). *Пагубная самонадеянность. Ошибки социализма*. Москва: Изд-во «Новости» при участии изд-ва «Catallaxu», 304.

<sup>3</sup> Чухно, А. (2008). Інституціональна архітектоніка та інституціональна динаміка розвитку. *Економіка України*, 7, 137-143.

<sup>4</sup> Шкарлет, С.М. (2014). Інкорпорація домінант інформаційної економіки до механізму забезпечення сталого розвитку держави. *Соціально-економічний розвиток регіонів в контексті міжнародної інтеграції*, 13, 45-53.

<sup>5</sup> Фінагіна, О.В., Поддубняк, В.В. (2011). Соціальні трансформації та особливості їх інституціоналізації в українському суспільстві. *Управління проектами та розвиток виробництва*, 4, 142-146.

<sup>6</sup> Lewis, R.D. (2006). *When cultures collide: Leading across cultures*. Nicholas Brealey International, 593.

<sup>7</sup> Мазур, І.І. (2011). Тінізація економіки України в сучасних умовах. *Вісник донецького національного університету*, 2, 52-57.

<sup>8</sup> Ворончак, І.О. (2013). Регіональні аспекти розвитку соціальної відповідальності бізнесу в Україні: методологія та практика оцінювання. *Економіка. Управління. Інновації*. <[http://nbuv.gov.ua/UJRN/eui\\_2013\\_2\\_17](http://nbuv.gov.ua/UJRN/eui_2013_2_17)> (2017, May, 25)

<sup>9</sup> Сурай, А.С. (2017). Методичні основи моніторингу ділового середовища України: індекс рівня розвитку в регіональному розрізі. *Науковий економічний журнал «ІНТЕЛЕКТ XXI»*. Київ. Національний університет харчових технологій, 2, 182-188.

The main objective of this study is to adapt and test the method to domestic conditions. Following the proposed methodology, we will analyze the level of development of the business environment of Ukraine's regions, with the goal of further clustering and graphic interpretation of the results, zoning of territories, which could form the basis for the formation of a Strategic Map of the territorial development of Ukraine and the allocation of "business escalation zones". We will only consider the final result tables, omitting a significant part of the intermediate calculations.

1. Criterial selection of indicators. The advantage of the proposed model is that in the conditions of the variability of statistical data, the methodology will work with a flexible set of output data. Let's return to the main areas that form the complex view of such a phenomenon as the business environment and those empirical data that can provide us with current statistics to reflect the state of these areas. All empirical data are divided into 7 spheres, which form the business environment and contain 40 statistical indicators. We conditionally divided them into 2 large groups: Main and cross derivatives. The main ones are relatively autonomous (if at all possible speaking about the autonomy of socio-economic phenomena within a single territorial unit), but with a certain set of signs and influence on the processes taking place in society, they are dominant. And cross derivatives are the areas that deserve to be placed in a separate paragraph of the classification, but there are "players in the field" of several of the main spheres that shape the business environment. Main areas: 1. Economic: (business, financial, communication, technological and innovative); 2. Social; 3. Political; 4. Legal. Derivative crosses: 5. Institutional; 6. Informational; 7. Ecological.

The following steps:

2 – the Construction of indexes to methodically compatible form;

3 – the Introduction of information unidirectionality of the selected indicators;

4 – Calculation of the integral index of business environment for each of the areas in the regional context – integral partial index – we in our study omitted, as they increasingly have the mathematical color (using methods of rating, theoretical scale variations, multidimensional simple average) and is a tool to reach the next stage, which will give us the criteria for a thorough interpretation of the results.

5. Determination of partial coefficients for our proposed 7 areas of functioning of business environment can be obtained in two ways. The first – as a result of expert conclusions of scientists in this area, top management of business structures, which will directly provide the weight to each of the spheres. The second is a more complex method, which also requires the presence of experts, but the decision-making process is more regulated and contains a direct link with the empirical base and proceeds from the optimal prototype of the business environment proposed by the author in previous studies. According to the results of the experts' work on the proposed method of weighing the impact of each of the spheres of the business environment, the following results are obtained: The total weight is 1: – economic sphere – 0,33; – social sphere – 0,25; – political – 0,08; – the legal sphere – 0,14; – institutional sphere – 0,08; – information sphere – 0,08; – ecological sphere – 0,05 [10, p. 67-80].

Thus, we obtained the indicator CH<sub>g</sub> – the weight coefficient of the g-th business environment, necessary for calculating the integrated index of the business environment in the regional context.

6. Calculation of the integral index of the business environment in a regional context (integral aspect of the analysis of the business environment).

Imagine the general formula for calculating the integral index of the business environment:

$$\ln PDCP_i = \sum_{g=1}^{ng} \square CH_g S_{ig}, \tag{1}$$

where CH<sub>g</sub> – weight factor of the g-th sphere of the business environment,

where  $\sum_{g=1}^{ng} \square CH_g = 1,7$ .

S<sub>ig</sub> – integral partial indices of the g-th sphere of the business environment (IchEDC, IchCDC, IchPDC, IchPpDC, IchIDC, IchIfDC, IchEIDC), i- th region, g=1,7 and i=1,27.

By transferring this equation to our specific data, we obtain the following equation:

$$\ln PDCP_i = CH_1 * IchEDC + CH_2 * IchCDC + CH_3 * IchPDC + CH_4 * IchPpDC + CH_5 * IchIDC + CH_6 * IchIfDC + CH_7 * IchEIDC \tag{2}$$

where i – country region and in our case i=1,27.

In turn, introducing into the equation the concrete values of the partial coefficients of 7 spheres of the business environment, we obtain the equation:

$$\begin{aligned} \text{InPDCPi} = & 0,33 * \text{IchEDC} + 0,25 * \text{IchCDC} + 0,08 * \text{IchPDC} + 0,14 * \text{IchPpDC} + \\ & + 0,08 * \text{IchIDC} + 0,08 * \text{IchIfDC} + 0,05 * \text{IchEIDC} \end{aligned} \quad (3)$$

We calculate the integral index of the business environment for 27 territorial units of Ukraine separately for 2005, 2010, 2015 years according to the given formula.

In the framework of the proposed method, the integral indicator of the level of business environment of the region varies from 0 to 1. The closer the indicator to one, the higher the level of development of the business environment, we fix. The result of calculating the integral index of the business environment of the region or certain territories is hierarchically located regions of Ukraine, given the level of development of the business environment. The specific value of the integral index (or indices characterizing the individual spheres of the business environment) has no economic interpretation – only the place that belongs to each particular region on a single scale is important.

So, the author has calculated integral indexes of economic, social, political, legal, institutional, informational, and ecological environment. Their results allowed to obtain an integral index of the business environment of the regions of Ukraine (Table 1).

Table 1

**Integral index of business environment development of the regions of Ukraine  
in 2005, 2010 2015 years calculated by the author's methodology**

Development index of the region business environment			
Region	InPDCPi		
	2005 year	2010 year	2015 year
ARC	–	–	–
Vinnitsia	0,39	0,38	0,39
Volyn	0,39	0,39	0,39
Dnipropetrovsk	0,43	0,43	0,40
Donetsk	0,41	0,38	0,25
Zhytomyr	0,38	0,34	0,36
Zakarpattia	0,38	0,36	0,36
Zaporizhzhia	0,42	0,35	0,37
Ivano-Frankivsk	0,37	0,39	0,39
Kyiv	0,45	0,43	0,41
Kirovohrad	0,38	0,36	0,38
Luhansk	0,29	0,31	0,31
Lviv	0,42	0,37	0,41
Mykolaiv	0,39	0,36	0,37
Odesa	0,40	0,40	0,35
Poltava	0,35	0,37	0,37
Rivne	0,36	0,34	0,35
Sumy	0,36	0,36	0,36
Ternopil	0,40	0,38	0,37
Kharkiv	0,43	0,43	0,40
Kherson	0,39	0,36	0,36
Khmelnyskyi	0,38	0,37	0,38
Cherkasy	0,37	0,38	0,38
Chernivtsi	0,38	0,38	0,39
Chernihiv	0,38	0,35	0,33
Kiev city	0,75	0,71	0,73
Sevastopol city	–	–	–

7. Comparative assessment and ranking of regions according to the value of the integral index of business environment development (cluster aspect of the analysis of the business environment of the world countries).

We will group 5 zones with a step of 0,02, which covers the following interval limits of the integral coefficient of the business environment development: from 0,73 to 0,25: zone 1 – more than 0.4 – high development level of the business environment; zone 2 – 0,39-0,4 – moderate development level of the business environment; zone 3 – 0,37-0,38 – medium development level of the business environment; zone 4 – 0,35-0,36 – low development level of the business environment; zone 5 – less than 0,35 – the lowest development level of the business environment.

The ranking results for 2015 year are shown in Table 2. For 2005 and 2010 years in descriptive form.

Table 2

**Ranking of the regions of Ukraine by the level of development  
of the business environment in 2015 year**

Development index of the region business environment			
Development index of the business environment (clusters)	Region	Symbol	InPDCPi
			2015 year
High	ARC		–
	Sevastopol city		–
	Kiev city		0,73
	Lviv		0,41
	Kyiv		0,41
Moderate	Kharkiv		0,40
	Dnipropetrovsk		0,40
	Chernigiv		0,39
	Vinnitsa		0,39
	Volyn		0,39
	Ivano-Frankivsk		0,39
Medium	Khmelnysky		0,38
	Kirovograd		0,38
	Cherkasy		0,38
	Poltava		0,37
	Mykolayiv		0,37
	Zaporozhye		0,37
	Ternopil		0,37
Low	Zakarpattia		0,36
	Zhytomyr		0,36
	Kherson		0,36
	Sumy		0,36
	Odesa		0,35
	Rivne		0,35
The lowest	Chernihiv		0,33
	Lugansk		0,31
	Donetsk		0,25

The results of the conducted grouping indicate that in 2015 year Lviv and Kyiv regions and Kyiv city entered the zone number 1.

The zone number 2 includes Kharkiv, Dnipropetrovsk, Chernivtsi, Vinnytsia, Volyn and Ivano-Frankivsk region. The most widespread is zone number 3 in the range of 0,37-0,38, covering 7 regions: Khmelnytskyi, Kirovohrad, Cherkasy, Poltava, Mykolaiv, Zaporizhzhia and Ternopil. Zone number 4

includes Zakarpattia, Zhytomyr, Kherson, Sumy, Odesa, Rivne regions. And the least widespread was zone number 5, this includes the region where the integral index of business environment development is more than 0,4, namely Donetsk, Luhansk and Chernihiv.

The integral index of the business environment in the regions of Ukraine, over the period under investigation, shows that the Kyiv city, Kyiv and Lviv regions remains the absolute and unchanging leaders in terms of the business environment. In 2010, the Dnipropetrovsk region was among the leaders, and in 2005 the first zone also included Kharkiv, Zaporizhzhia and Donetsk regions.

Ternopil, Odesa, Volyn, Kherson, Mykolayiv and Vinnytsia regions were located in the zone number 2 with an insignificant separation from the leaders – according to the results of 2005. However, in 2010, the situation changed dramatically, and only Odesa, Ivano-Frankivsk and Volyn regions were included in this group. In 2015, the zone has expanded again and includes Kharkiv, Dnipropetrovsk, Chernivtsi, Vinnytsia, Volyn and Ivano-Frankivsk regions.

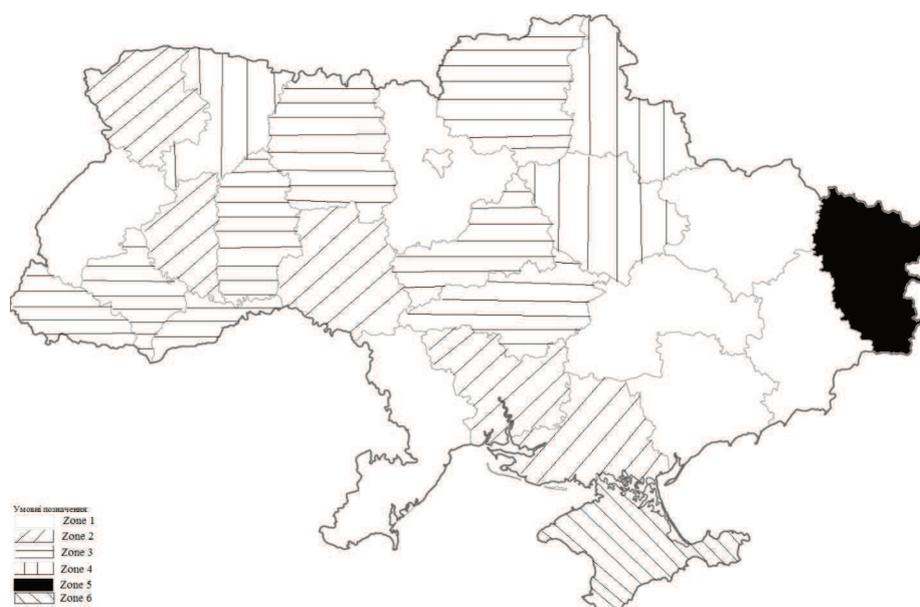
Zone number 3 is characterized by an average level of development of the business environment, it is the most widespread among the regions of Ukraine. In 2005 it included: Chernihiv, Khmelnytskyi, Kirovohrad, Chernivtsi, Zhytomyr, Zakarpattia, Cherkasy and Ivano-Frankivsk region. In 2010, the Donetsk, Vinnytsia, Ternopil and Poltava regions were added to the list, while Chernihiv, Khmelnytsky, Kirovohrad, Zhytomyr, and Zakarpattia regions left the zone. In 2015, the number of participants in this zone was reduced to 6, namely, Khmelnytskyi, Kirovohrad, Cherkasy, Poltava, Mykolaiv, Zaporizhzhia and Ternopil regions.

The zone number 4 includes the regions with a development index of the business environment within the range of 0,39-0,4. In 2005 it is the Sumy, Rivne and Poltava regions. In 2010, the number of participants significantly expanded, to the area related Nikolaev, Zakarpattia, Kherson, Sumy, Kirovohrad, Chernihiv and Zaporizhzhia regions. In 2015, this zone was formed by Zakarpattia, Zhytomyr, Kherson, Sumy, Odesa and Rivne regions.

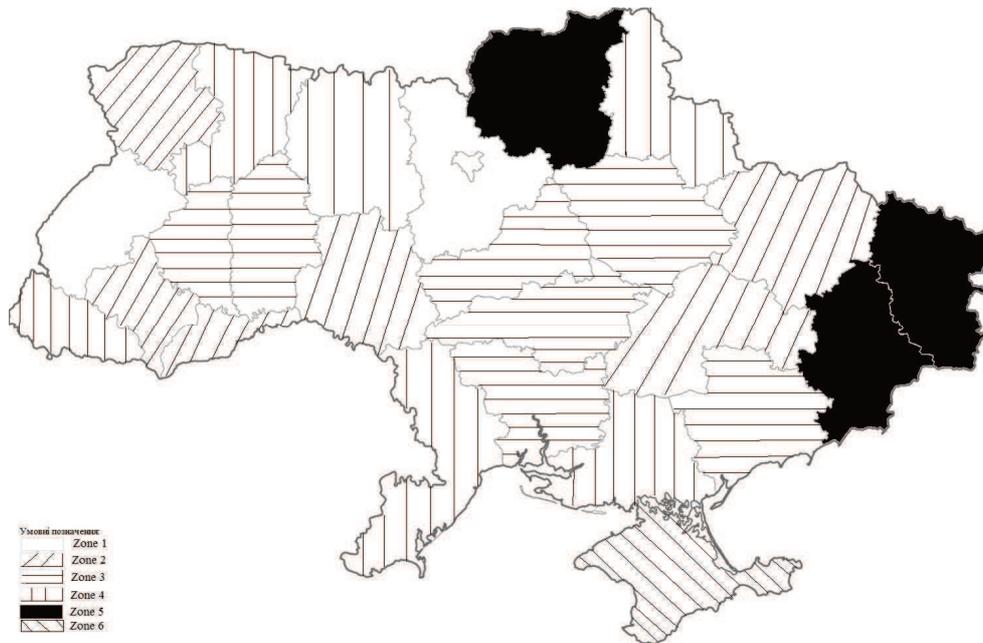
Zone number 5 includes regions with the lowest level of development of the business environment in Ukraine. In 2005, it was only the Luhansk region, which, by the way, remains in this zone throughout the studied period. In 2010, Zhytomyr and Rivne regions were added to the list, and in 2015 – Chernihiv and Donetsk regions.

The integral index of the business environment indicates extremely high polarization and uneven development of the regions. Within the group of leading regions, the differentiation of the integral index of the business environment is so high that on this background, the parameters of the business environment of other regions become vague.

8. Graphic interpretation of the results. Visualizing the results we obtained in the previous stages for 2005 and 2015 years.



**Fig. 1. Zoning of the regions of Ukraine according to the index of development of the business environment, 2005 year**



**Fig. 2. Zoning of the regions of Ukraine according to the index of development of the business environment, 2015 year**

The development index of the business environment of the Ukraine regions, calculated by us, proves the extremely pronounced polarization and unevenness of the processes of territories development. Among the sample, which includes the regions with the highest level of development, the scale of the index of the integral development index is so significant that, in view of this, level indicators of the business environment development of the territories not included in the group of leaders become indistinct.

**Conclusions.** Thus, the integral index is the derivative value from imposing on each other the parameters of various elements of the business environment – economic (business, financial, communication, institutional), social, informational, ecological, innovation environment. As a result, it represents the most general quantitative characteristic of the business climate in the region. Calculated on the basis of accumulated in scale regions and the country as a whole statistical information, it is least subject to manipulation and can act as an objective quantitative criterion for zoning the territory and the formation of a strategic map of the territorial development of Ukraine.

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