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THE SYSTEM OF INDICATORS OF THE FINANCIAL STABILITY OF THE LOCAL BUDGET AS A COMPONENT OF THE ASSESSMENT OF THE COMPETITIVE IMMUNITY OF THE REGION

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The article examines the essence of competitive immunity and gives the main stages of evaluating the competitive immunity of the region. There are three blocks for assessing the competitive immunity of the region: information and digital approach; information and digital technologies; value and reputation management. In accordance with the selected blocks, the objects of management influence necessary for assessing the competitive immunity of the region and bringing it to sustainable functioning are defined, namely: production sustainability, financial sustainability, socio-economic sustainability, informational and psychological sustainability, market sustainability, sustainable innovative development, growth of business value, balanced innovative infrastructure and reputation of the region. For one of the important objects of managerial influence, namely, financial stability, a system of indicators of a comprehensive analysis of the financial stability of the local budget as a component of competitive immunity is proposed, which should be considered in three groups: analysis of the balance of the local budget, analysis of financial stability and analysis of budget efficiency. The proposed ratio complex consists of twelve indicators, namely: coefficient of budget coverage, coefficient of budget sustainability, coefficient of general tax stability, coefficient of cost coverage by interbudgetary transfers, coefficient of budget dependence, coefficient of tax independence, coefficient of stability of the income base, the share of equalization grants in the total amount of transfers, local budget deficit ratio, coefficient of budgetary efficiency, coefficient of budgetary support, indicator of stability of the revenue part of the budget. The essence and normative values of the proposed indicators were considered. Within the framework of the proposed approach, the components of the integral indicator of the financial stability of the local budget are considered. The essence and algorithm of the work of Kohonen's neural networks with the aim of its further use for the segmentation of regions based on indicators of financial stability of regions are given.

Keywords: competitive immunity, region, financial stability, competitiveness, clustering, neural networks.

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Introduction and statement of the problem

The sustainable development of the regional socio-economic sphere in modern conditions requires regions to gain strong competitive positions, however, the presence of competitive advantages must be supported by competitive potential in the set

economic goals. The problem of increasing the level of competitive immunity of the regions is methodologically closely related to its evaluation, since the evaluation is a reference point when making decisions on strengthening the position of the region and indicates the effectiveness of its activities. The

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assessment of competitive immunity is a methodological basis for improving competitive advantages and determining ways to increase the level of competitiveness of the region and making the right decisions in order to form and manage competitive advantages. Such an assessment allows for a comprehensive review of the region, identifying and strengthening strengths, while at the same time eliminating weaknesses. Currently, there is no generally accepted approach to assessing the competitive immunity of the region, the general level of competitiveness or the competitive advantages of the regions, so the assessment method and the system of indicators are an individual choice. The use of different methods, models and approaches can give opposite results, this accompanies the analysis of existing concepts, which will allow to objectively and accurately determine the level of competitiveness of the region, which is an urgent task in modern conditions.

Analysis and research of publications

General approaches to solving regional problems are presented in the works of domestic scientists: L. Antonyuk, O. Bobrovska, L. Kostyrko, I. Brikova, I. Kaminska, and others. Also, the study of the competitiveness of regions is followed in the works of foreign scientists: M. Porter, I. Turok, E. Birney, E. Ramsey, M. Keyston, R. Martin, R. Bohma and others. The essence of competitive positions is considered by scientists D. Ricardo, E. Heckscher and B. Olin, P. Samuelson and V. Stolper, V. Leontiev, I. Ansoff, P. Drucker, B. Karloff, V. Keegan and T. Peters. Regarding the competitive advantages of the region, its competitiveness, and competitive immunity, this issue is poorly researched, as well as the methods of strengthening the competitive advantages of a separate region, which confirms the relevance of the study and requires the development of new methodological aspects of regional analysis and improvement of the assessment of its competitiveness.

The purpose of the article

Development of a methodology for assessing the competitive immunity of the region due to the financial stability of the local budget based on the construction of integral indicators.

Statement of the main material

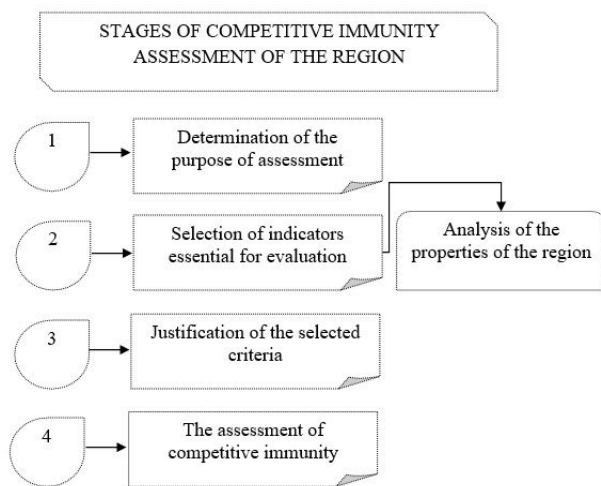
The development of the national and regional economies is based on various factors, one of which is competitiveness. Interregional competition is the desire of the territory to win target groups of consumers and life resources. An important decision is the choice of a method of assessing the competitiveness of regions, considering that such an

assessment should carry objective quantitative and qualitative information. Assessment acts as one of the tools for managing phenomena and processes occurring in systems of different levels, including the meso level, which also includes regional socio-economic systems.

When evaluating any system, a set of criteria is developed for its effectiveness and efficiency, considering that the criteria are diverse, the type of system significantly affects the choice of the type of criteria: quantitative or qualitative. If we talk about methodical approaches to the assessment of the competitive positions of regions, the assessment can be carried out in different ways: using for the analysis of the competitive advantages of the region the assessment of the effectiveness of the elements of socio-economic potential; the use of quantitative assessment methods based on macroeconomic indicators to analyze trends in the socio-economic development of the region and optimize certain types of activities; the use of rating assessments to analyze the investment attractiveness of the region, etc. [1]. As noted by V. Velichko, the existing groups of methodical approaches for assessing the competitiveness of regions differ due to their features, focus on identifying specific patterns, have advantages and disadvantages corresponding to their mechanism, but they are united by the main indicators used to evaluate competitive positions and competitive advantages. As a rule, most often, such indicators include a group of demographic indicators, a group of social indicators, economic indicators, population welfare, but there are also indicators that are included in the assessment of the competitiveness of the region, but are not so often used. Everything depends on the task, the availability of statistical data and a clear understanding of the purpose of the research. The main stages of evaluation are shown in Fig. 1.

Competitive immunity of the region demonstrates new characteristics of modern territorial competition under the conditions of globalization, which essentially distinguishes it from the concept of economic security and general competitiveness. The evaluation process takes place in stages, the main evaluation stages are shown in Fig. Before evaluating the results of the competitive immunity of the region, first of all, it is necessary to decide on the indicators by which the competitive immunity will be evaluated. The selection of indicators for evaluation is usually reduced to the following principles: each coefficient should correspond to the purpose of the study, have a clear definition, be calculated according to actual values and be useful.

The analysis of theoretical and methodological



Stages of assessing the competitive immunity of the region

concepts of regional competitiveness represents a wide range of points of view. The variety of existing concepts allows you to choose a methodology for a specific study of a given goal. Part of the research reveals the assessment of competitiveness through the national economy, but indicators used at the macro level cannot always be applied at the level of regions, on the other hand, research is aimed at considering regional competitiveness as the aggregate competitiveness of firms. Some works are aimed at highlighting the dynamics of economic growth or the ability of regions to generate relatively high levels of income and employment. Not always in studies of competitive advantages and competitiveness at the regional level, attention is paid only to economic factors, for example, R. Boschma emphasizes the importance of non-economic factors, such as social, cultural and institutional, in the formation of regional competitiveness [2]. The assessment of competitive advantages of regions can be based on the determination of management efficiency and considering the development strategy, P. Kresl in his research [3] singles out two groups of factors of regional competitiveness: strategic factors (management efficiency, development strategy) and economic factors (economic structure, production factors, infrastructure). Summarizing the materials on this issue shows that the functions of regional competitiveness management include the assessment of current competitive advantages, the analysis of parameters and factors that affect the position of the region in the competitive space, the selection of key regional indicators to strengthen the competitive position, and the selection of tools. It should be noted that the competitiveness of the territory records the state of the region at a certain point in time, and

the formation of competitive immunity involves the analysis of competitive positions in the dynamics with a future perspective, i.e., the competitive immunity of the region demonstrates the ability to record not only the existing competitive advantages, but also the prerequisites for their support and effective use.

Competitive immunity is considered as the ability to successfully compete with other regions in order to achieve sustainable economic growth, create and maintain optimal production, commercial and social ties, as well as consistently increase the level and quality of life of the population. In accordance with the concept of competitive immunity of the region adopted by the authors [4], for its assessment it is proposed to highlight the objects of managerial influence necessary for assessing competitive immunity and bringing it to sustainable functioning. Objects of managerial influence should be divided into blocks: information and digital approach, information and digital technologies, and value and reputation management. It is these blocks that include objects of managerial influence, necessary for evaluating competitive immunity and bringing it to sustainable functioning. Each of the blocks involves detailed consideration and analysis, selection of indicators that reflect a specific object of managerial influence. According to the defined structure, the information-digital approach includes production sustainability, financial sustainability, socio-economic sustainability and information-psychological sustainability; market stability and sustainable innovative development should be attributed to information and digital technologies; value and reputation management includes the following objects of management influence: growth of business value, balanced innovative infrastructure and stable image or reputation of the region .

In order to identify the factors that have the greatest influence on the state of competitive immunity for each component, it is recommended to conduct an appropriate analysis based on significant indicators. One of the most significant elements as a component of the region's competitive immunity is financial stability. Ensuring the financial stability of regions under the influence of negative environmental factors is the most important task facing regional and municipal management bodies, the level and quality of life of the population depend on its solution [5; 6; 7]. The competitive immunity of the region is largely determined by the financial stability of the region. It is clear that the high level of financial stability of the region opens up financial opportunities for it, which significantly affect the

positioning of the region in the competitive space. This leads to the need to consider financial stability as an object of managerial influence of the region's competitive immunity. The analysis of existing methods and indicators led to the fact that the most adapted for the current research with a certain level of significance is the system of indicators of the comprehensive analysis of the local budget, proposed by L. Kostyrko. [8], therefore, in order to assess financial stability as a component of the region's competitive immunity, it is proposed to select an integral indicator formed from a set of standardized indicators that reflect a certain aspect of the system's potential capabilities. The proposed system is shown in Table.

To determine the financial stability in terms of the issue of competitive immunity of the region, it is proposed to use the given coefficient complex, which consists of twelve main indicators. The value of the budget coverage ratio demonstrates the ability of the budget to cover its obligations planned for the budget year, the normative value of this indicator is in the range from 0,95 to 1. The value of the following ratio: budget sustainability, shows the share of the budget whose source of financing is sustainable. that is, these are the sources that are used to form the regional budget during a certain period of time. The normative value of the budget stability coefficient is less than 0,3, if the value is greater than the normative value, the regional budget will be considered financially sustainable. Violation of stability in the

stability of the regional budget will be observed in a situation where the value of the indicator is lower than the normative one. The indicator reflecting the share of tax revenues takes a normative value in the range from 0,2 to 0,5. A value less than the normative one indicates that the structure of this type of income is formed inefficiently and vice versa. The coefficient of coverage of costs by interbudgetary transfers shows the degree of coverage of the local budget deficit by revenue sources without considering the approved volume of free revenues and tax revenue receipts according to additional standards of deductions. For regions, this indicator should not exceed 30%.

One of the key indicators of the block of financial stability: the coefficient of budget dependence. The value of this coefficient shows the share of non-paid and non-returnable revenues in relation to total budget revenues, determining the structure of budget revenues. The normative value of this coefficient is more than 0,1 (that is, 10% of the total amount of budget revenues). A value below the recommended value indicates a high level of budget independence, if the value of the indicator is higher than the normative value, the budget of the region can be called dependent on gratuitous and non-refundable incomes. The coefficient of tax independence (independence) of the local budget shows to what extent budget revenues are formed at the expense of income from tax revenues. The determination of this coefficient is based on considering all tax revenues, regardless of tax status.

The system of indicators of a comprehensive analysis of the financial stability of the local budget as a component of competitive immunity [5]

| Group | Indicator | Calculation of the indicator |
|---|---|---|
| Analysis of the balance of the local budget | Coefficient of budget coverage | $K_{BC} = \text{budget revenues} / \text{budget expenditures}$ |
| | Coefficient of budget sustainability | $K_{BS} = \text{interbudgetary transfers from the state budget} / \text{budget revenues}$ |
| | Coefficient of general tax stability | $K_{GTS} = \text{tax revenues} / \text{budget expenditures}$ |
| | Coefficient of cost coverage by interbudgetary transfers | $K_{IT} = \text{interbudgetary transfers from the state budget} / \text{budget expenditures}$ |
| Analysis of financial stability | Coefficient of budget dependence | $K_{BD} = \text{inter-budget transfers from the state budget} / \text{budget revenues} + \text{inter-budget transfers from the state budget}$ |
| | Coefficient of tax independence | $K_{TI} = \text{tax revenues} / \text{budget revenues}$ |
| | The coefficient of stability of the income base | $K_{SIB} = (\text{tax revenues} + \text{non-tax revenues}) / \text{budget revenues}$ |
| Analysis of budget efficiency | The share of equalization grants in the total amount of transfers | $K_{EG} = \text{amount of equalization subsidies} / \text{interbudgetary transfers from the state budget}$ |
| | Local budget deficit ratio | $K_{BDR} = (\text{budget revenues} - \text{budget expenditures}) / \text{budget expenditures}$ |
| | Coefficient of budgetary efficiency | $K_{BE} = \text{budget revenues} / \text{average population for the year}$ |
| | Coefficient of budgetary support | $K_{BS} = \text{budget expenditures} / \text{average population for the year}$ |
| | Indicator of stability of the revenue part of the budget | $K_{SR} = \text{tax revenues} / \text{interbudgetary transfers from the state budget}$ |

For regions, this indicator should be at least 0,3. The value of the coefficient, which demonstrates the stability of the income base, has a normative value of more than 0,6. A coefficient expressing the share of equalization grants in the total amount of transfers. By accepting subsidies, the region does not impose any additional financial obligations on itself. The normative value is less than 60.

The analysis of budget efficiency involves an assessment of the quality of regional finance management, which plays an important role in ensuring the stable financial condition of local budgets. The budget deficit ratio reflects the degree of regional budget deficit in revenue sources without considering the approved volume of non-paid and non-refundable revenues. The standard value for this indicator is greater than zero. The coefficient of budget efficiency characterizes the volume of budget revenues per 1 inhabitant of the region, and is calculated as a share of budget revenues from the average population for the year. The analysis of this coefficient is carried out by observing its change in dynamics, the positive trend is growth. Also, an important indicator of this block is the coefficient of budgetary provision, the value of which, like the value of the coefficient of budgetary effectiveness, shows a positive trend only when this indicator increases in dynamics. Calculation of the indicator of the stability of the income part of the budget in accordance with the planned indicators makes it possible to assert the effectiveness of budget planning and the budget execution process. In addition, the value of this assessment will indicate the effectiveness of the government's financial policy. For regions, this indicator should be greater than 1.

When analyzing the financial stability of local budgets, it is necessary to focus on the value of the coefficient in the dynamics: if an upward trend is observed, this indicates that the budget has the ability to cover existing obligations, and vice versa, the inability to cover obligations is illustrated when the values of the indicator actually decrease.

The calculation of the integral indicator of the financial stability of the local budget according to this method is calculated as the sum of aggregated standardized indicators for each of the existing blocks of analysis, considering certain weights of each block:

$$IP_{fs} = (SI_{fb} \cdot w_{fb}) + (SI_{fi} \cdot w_{fi}) + (SI_{ibe} \cdot w_{ibe}), \quad (1)$$

where IP_{fs} – is an integral indicator of the financial stability of the local budget of the region; SI_{fb} – a standardized indicator for the block of financial balance of the region; SI_{fi} – a standardized indicator

for the block of financial independence of the region; SI_{ibe} – is a standardized indicator for the block of local budget efficiency; w_{fb} , w_{fi} , w_{ibe} , are the weights of the indicator for the block of the financial balance of the region, the financial independence of the region and the efficiency of local budgets, respectively.

The qualitative interpretation of the values of the integral indicator, obtained using the proposed method of comprehensive analysis of the financial stability of the local budget, allows to analyze the financial stability of the local budget, to identify the influence of factors on its changes and to assess the financial stability of local budgets for the future, as well as to justify the choice of the direction of the budget development. The developed methodological approach is the basis for a preliminary assessment of the financial stability of the forecast indicators of local budgets and the justification of measures to ensure their stability, considering the risk.

An applied study of this methodology for assessing the financial stability of the budget as an object of managerial influence at the local level will be appropriate if it is possible to compare the results, that is, on the example of at least several regions based on statistical data on the implementation of local budgets, reports and decisions of regional councils on the regional budget. To achieve the goal, it is suggested to make a clustering, and to compare and evaluate the effectiveness of the obtained results, use a neural network basis: Kohonen maps. Cluster groupings are able to provide not only quantitative growth of the economy, but also to stimulate innovative activity in the region and interrelated branches of industry. The cluster approach in the management of regional development creates opportunities for the region to develop in the conditions of the transition to an innovative development model. There are many approaches to the concept of «cluster», summarizing, it can be distinguished that they are characterized by the union of researched objects that stand out from a large population with a feature corresponding to one of the groups being created.

When determining specialization in the economic space, clusters rely on the following methods [9]:

– analytical method: data research on the territory, its natural, labor and financial resources of productive forces;

– method of indicative planning of competitiveness: quantitative and qualitative analyzes of existing and determination of prospective competitiveness;

– modeling method: study of cluster objects by building and studying models of actually existing organizations, processes or phenomena;

– the «expenditure-output» method: the study of the circulation of goods and services between industries and other sectors of the economy.

Kohonen's self-organized maps, in addition to modeling clustering processes on a neural network basis, allow visualization of the obtained clusters [10]. As part of the selected set of cluster analysis algorithms, the authors singled out the Kohonen network algorithm – a type of neural networks that use unsupervised learning. With such training, there is no comparison of neuron output with reference values (learning without a teacher) [10]. The Kohonen network has only two layers: input and output, which is called a self-organizing map. The elements of the map are located in some space, usually two-dimensional, and the training of the network is carried out by the method of successive approximations. Starting with a randomly selected initial location of centers, the algorithm is gradually improved to cluster the training data. The total number of weighting factors is calculated as the product of the number of neurons (K) and the number of input variables of the network (M) [10]:

$$N_w = MK. \quad (2)$$

The number of neurons is equal to the number of clusters, among which the initial distribution and subsequent redistribution of the training sample takes place. The number of input variables of the neural network is equal to the number of features characterizing the research object and on the basis of which it is assigned to one of the clusters.

Self-learning and self-organization of the Kohonen neural network should be distinguished. With normal self-learning, the network has a fixed structure, that is, the number of neurons that doesn't change during the entire life cycle. In case of self-organization of the network, on the contrary, there is no permanent structure. Depending on the found distance to the winning neuron, this neuron is used for clustering the example, or a new cluster is created for the input example with the corresponding weighting coefficients. On the other hand, in the process of self-organization of the structure of the Kohonen network, individual neurons can be excluded from it.

Normalization of input variables is performed within [-1; 1] or [0; 1]. The life cycle of neural networks of this architecture is characterized by three main stages of the life cycle: training, cluster analysis

and practical use.

Kohonen's network learning algorithm includes stages, the composition of which depends on the type of structure: permanent (self-learning network) or variable (self-organizing network). For self-study, the following are performed sequentially:

– task of the network structure, that is, the number of neurons of the Kohonen layer (K);

– random initialization of the weighting coefficients with values satisfying one of the following constraints:

– when normalizing the original sample within [-1; 1]:

$$|w_{ij}| \leq \frac{1}{\sqrt{M}}; \quad (3)$$

– when normalizing the original sample within [0; 1]:

$$0,5 - \frac{1}{\sqrt{M}} \leq w_{ij} \leq 0,5 + \frac{1}{\sqrt{M}}; \quad (4)$$

– feeding a random training example of the current training epoch to the network inputs and calculating the Euclidean distances from the input vector to the cluster centers:

$$R_j = \sqrt{\sum_{i=1}^M (\tilde{x}_i - w_{ij})^2}; \quad (5)$$

– based on the smallest value of R_j , the winning neuron j is selected, which is closest in value to the input vector. The weight coefficients are corrected for the selected neuron:

$$w_{ij}^{(q+1)} = w_{ij}^{(q)} + v \cdot (\tilde{x} - w_{ij}^{(q)}), \quad (6)$$

where v – is the learning rate coefficient;

– the cycle repeats from the third step until one or more termination conditions are met:

– the specified maximum number of training epochs has been exhausted;

– there was no significant change in the weighting coefficients within the specified accuracy during the last day of training;

– the specified maximum physical training time has been exhausted.

The learning rate coefficient can be set as a constant from the bounds [0; 1] or a variable value that gradually decreases from epoch to epoch.

In the case of self-organization of the Kohonen network, the algorithm undergoes certain changes. The critical distance R_{cr} is specified, which corresponds to the maximum permissible Euclidean distance between the inputs of the example and the weights of the winning neuron. The initial structure contains no neurons. When the first example of the training sample is applied to the inputs of the network, the first neuron is created with weighting coefficients equal to the given input value

A new randomly selected example of the current learning epoch is fed to the network inputs, the Euclidean distances from the example to the center of each cluster are calculated according to relation (4) and the winning neuron with the smallest R_{min} is determined. If the condition $R_{min} \leq R_{cr}$ is fulfilled, the weight coefficients of the corresponding winning neuron are corrected, otherwise a new neuron is added to the network structure, the weight coefficients of which are assumed to be numerically equal to the input value of the given example. The procedure is repeated from the second step. If any clusters remained inactive during the last training, the corresponding neurons are excluded from the structure of the Kohonen network. Calculations end if one of the conditions specified in the self-learning algorithm of the fixed structure network is met.

The use of cluster analysis and Kohonen maps based on indicators of the financial stability of regions will allow us to segment the regions of Ukraine into a given number of homogeneous groups according to the level of values relative to the local budget. Research on a neural network basis will allow to form a list of priority directions of economic development of regions, to get an idea not only about promising directions of development, but also to identify key parameters that will ensure the competitiveness of the region and strengthen its competitive immunity.

Conclusions

The considered technique can be used for an integral assessment of the state of local budgets and the construction of a rating of regions according to the criterion of financial stability in terms of the issue of competitiveness of regions, carrying out clustering or using neural networks to obtain results regarding the stability of the region according to the financial state of budget support. The methodology requires the determination of the weighted values of the coefficients and the establishment of the threshold values of the level of the financial condition for assigning the regions to a certain type according to the level of budgetary security. The proposed methodology will allow analyzing the state of regions,

evaluating budgetary resources and the results of their use, grouping regions according to the level of financial sustainability of budgets and distinguishing groups with regions that have more or less homogeneous values of indicators, identifying budgetary threats and risks regarding the loss of competitive advantages; develop measures to strengthen the competitive immunity of the region.

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**СИСТЕМА ПОКАЗНИКІВ ФІНАНСОВОЇ СТІЙКОСТІ
МІСЦЕВОГО БЮДЖЕТУ ЯК СКЛАДОВА ОЦІНКИ
КОНКУРЕНТНОГО ІМУНІТЕТУ РЕГІОНУ***Писарькова В.Р., Стрельченко І.І.*

В статті розглянуто сутність конкурентного імунітету та наведено основні етапи оцінювання конкурентного імунітету регіону. Виділено три блоки для оцінювання конкурентного імунітету регіону: інформаційно-цифровий підхід; інформаційні та цифрові технології; вартісне та репутаційне управління. Відповідно до виділених блоків визначено об'єкти управлінського впливу, необхідні для оцінювання конкурентного імунітету регіону та приведення його до стійкого функціонування, а саме: виробничу стійкість, фінансову стійкість, соціально-економічну стійкість, інформаційно-психологічну стійкість, ринкову стійкість, стійкий інноваційний розвиток, зростання вартості бізнесу, збалансовану інноваційну інфраструктуру та репутацію регіону. Для одного з важливих об'єктів управлінського впливу, а саме, фінансової стійкості, запропоновано систему показників комплексного аналізу фінансової стійкості місцевого бюджету як складової конкурентного імунітету, яку доцільно розглядати за трьома групами: аналіз збалансованості місцевого бюджету, аналіз фінансової стійкості та аналіз ефективності бюджету. Запропонований коефіцієнтний комплекс складається з дванадцяти показників, а саме: коефіцієнта бюджетного покриття, коефіцієнта стійкості бюджету, коефіцієнта загальної податкової стійкості, коефіцієнта покриття витрат міжбюджетними трансфертами, коефіцієнта бюджетної залежності, коефіцієнта податкової самостійності, коефіцієнта стійкості дохідної бази, частини дотацій вирівнювання в загальній сумі трансфертів, коефіцієнта дефіцитності місцевого бюджету, коефіцієнта бюджетної результативності, коефіцієнта бюджетного забезпечення та показника стабільності дохідної частини бюджету. Розглянуто сутність та нормативні значення запропонованих показників. В рамках запропонованого підходу розглянуто складові інтегрального показника фінансової стійкості місцевого бюджету. Наведено сутність та алгоритм роботи нейронних мереж Кохонена з метою його подальшого використання для сегментування регіонів на основі показників фінансової стійкості регіонів.

Ключові слова: конкурентний імунітет, регіон, фінансова стійкість, конкурентоспроможність, кластеризація, нейронні мережі.

**THE SYSTEM OF INDICATORS OF THE FINANCIAL
STABILITY OF THE LOCAL BUDGET AS A COMPONENT
OF THE ASSESSMENT OF THE COMPETITIVE
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The article examines the essence of competitive immunity and gives the main stages of evaluating the competitive immunity of the region. There are three blocks for assessing the competitive immunity of the region: information and digital approach; information and digital technologies; value and reputation management. In accordance with the selected blocks, the objects of management influence necessary for assessing the competitive immunity of the region and bringing it to sustainable functioning are defined, namely: production sustainability, financial sustainability, socio-economic sustainability, informational and psychological sustainability, market sustainability, sustainable innovative development, growth of business value, balanced innovative infrastructure and reputation of the region. For one of the important objects of managerial influence, namely, financial stability, a system of indicators of a comprehensive analysis of the financial stability of the local budget as a component of competitive immunity is proposed, which should be considered in three groups: analysis of the balance of the local budget, analysis of financial stability and analysis of budget efficiency. The proposed ratio complex consists of twelve indicators, namely: coefficient of budget coverage, coefficient of budget sustainability, coefficient of general tax stability, coefficient of cost coverage by interbudgetary transfers, coefficient of budget dependence, coefficient of tax independence, coefficient of stability of the income base, the share of equalization grants in the total amount of transfers, local budget deficit ratio, coefficient of budgetary efficiency, coefficient of budgetary support, indicator of stability of the revenue part of the budget. The essence and normative values of the proposed indicators were considered. Within the framework of the proposed approach, the components of the integral indicator of the financial stability of the local budget are considered. The essence and algorithm of the work of Kohonen's neural networks with the aim of its further use for the segmentation of regions based on indicators of financial stability of regions are given.

Keywords: competitive immunity, region, financial stability, competitiveness, clustering, neural networks.

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