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STATE SUPPORT OF AGRICULTURAL PRODUCERS AS A FACTOR IN INCREASING THE COMPETITIVENESS OF THE AGRICULTURAL SECTOR

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Abstract. Support for an agricultural enterprise lies in the presentation of a set of state subsidies and economic privileges to determine the essential development and the possibility of continuing functioning within the market. With that, the dynamics of production and consumption of agricultural products cannot always be positive due to the seasonality of doing business and the dynamics of prices for materials and equipment. The novelty of the study is determined by the fact that the formation of state support must be based on assessments of the reality of conducting business and forecasting operational indicators. The paper shows that the main importance of competitiveness should be considered by expert methods. The authors show that this enables an additional assessment of the level of economic security. The paper defines the level of permissible economic load and, accordingly, the enterprise's ability to achieve a stable financial situation both in the standard economic situation and in crisis situations. The practical significance of the study is determined by the structural component of ensuring the integrated economic security of the agricultural enterprise. The highlighted points of the paper allow to suggest ways of optimal structuring of current activities for the enterprise of the agricultural complex.

Keywords: agricultural enterprise; economic security; sustainability; development

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JEL Classifications: J43, N50, O13, Q1

1. Introduction

A generalized assessment of the tax competitiveness of an enterprise with the use of the hierarchy analysis method includes a purpose, as well as assessment parameters and criteria. This, as well as the options under comparison, are the main elements of the corresponding system (Abumhadi et al., 2012). Thanks to pairwise comparisons of the elements of each level of the indicated hierarchical structure, an inverse symmetric matrix can be obtained as a result, whose eigenvectors are the priority vectors of the options that are assessed and compared (Stadnyk, 2014; Rudenko, 2019).

The formation of an expert group and the organisation of its work constitute the first stage of a generalised sequence of assessing the tax competitiveness of an enterprise (Le Coq et al., 1997). The effectiveness of all subsequent steps will largely depend on the professionalism of such experts. They will analyse the parameters of comparing the tax policy of the enterprise and the possibilities of the tax environment, analyse the actual state of affairs, identify problems, and form conclusions and recommendations. Evidently, such experts must be selected according to certain criteria (Zhang, & Zhu, 1994). First of all, it is important that each member of the expert group possesses extensive knowledge on taxation of enterprises and is a practitioner in this subject area (Nefedova, 2016). Moreover, the expert's position must be as objective and independent of external influence as possible (Jiang et al., 2018; Rudenko et al., 2016; Trusova et al., 2019a).

A study of theory and practice suggests that it is advisable to identify the level of confidence in each expert, which is understood as a number that means the probability or level of probability with which the expert can be considered competent in the respective field (Tata, & McNamara, 2016; Rezk et al., 2019). It should be noted that the literature contains many important points concerning the formation of expert groups, as well as the use of expert methods in economic research, which, in particular, is confirmed by a review and generalisation of works (Hallová et al., 2019). The study of theory and practice allows to propose the formation of an interim committee for assessing the tax competitiveness of enterprises, which may include both employees and specialists from the external environment (Hoy, 2015; Moumen et al., 2019). This will ensure the highest level of objectivity, impartiality, and independence of such an assessment (Trusova et al., 2019b).

2. Literature Review

The specifics of the experts' activities in assessing the tax competitiveness of an enterprise is manifested primarily in the fact that they have to deal with two different aspects of taxes: on the one hand, this is the tax policy of the enterprise and everything connected with it, and on the other, designing the actual state of such a policy on the possibilities of the external tax environment (Kandulu et al., 2012). With that, it is important to emphasise that the task of experts is not to ascertain the fact that the existing tax policy of the enterprise complies with the current legislation, but to determine whether such a policy is optimised with the possibilities of the tax environment (which is much more complicated than solving the problem of establishing the fact of compliance). Thus, under these conditions, the level of subjectivity increases, which creates additional requirements for the professionalism of experts (Borodina et al., 2012; Sasongko et al., 2019).

It should be remembered that the work of experts in assessing the tax competitiveness of an enterprise is not limited only to the assessment as such (Rui, 2019). Based on its results, conclusions and recommendations should be formulated for managers and owners of a business entity regarding a better use of the tax environment (Odnorog, 2015). And this, in turn, indicates a fairly high level of responsibility of experts, because specific management decisions can be proposed to change individual elements of the tax policy of the enterprise, which will affect the object, tax base, periods for determining the tax base, the timing and procedure for paying taxes, etc. (Laurie et al., 2015). Potential changes can be either insignificant or dramatic (for example, when the form of entrepreneurship changes or certain areas of activity are liquidated) (Brummett et al., 2011). It should not

be forgotten that experts should be able to justify their position to the management and owners of enterprises on the appropriateness and necessity of changes, and this should be done by providing reasoned and particular facts, figures, and calculations (Turrall et al., 2010; Pashtetsky et al., 2018; Tarshilova et al., 2017).

A review and synthesis of literary sources, as well as a study of the practice of domestic enterprises, allows to conclude that the expert should be a practitioner who is thoroughly aware of the provisions of the current tax legislation (Nkhoma, 2018). Moreover, it is important that the expert knowledge is not only static, but also dynamic (past – present – future) (Guenthner et al., 2012). This is necessary because (as noted above) the tax environment is very dynamic and many changes are expected in the future.

3. Materials and Methods

Upon assessing the tax competitiveness of the enterprise, we shall denote the set of comparison options as follows (Eq. 1):

$$\theta = \{n_1, n_2\}, \quad (1)$$

where Θ – the set of comparison options upon assessing the tax competitiveness of an enterprise; n_1 – tax policy of the analysed company; n_2 – ideal tax policy, which can be interpreted as such due to the possibilities of the tax environment. Furthermore, we refer to seven generalised comparison parameters in the given case (taxpayers; objects and tax bases; tax rates; procedure for calculating taxes; tax periods; dates and procedure for paying taxes; dates of occurrence of tax obligations) and two comparison options n .

Considering the above, at the stage of problem statement and its structuring in the form of a hierarchy, the generalised hierarchical model for assessing the tax competitiveness of an enterprise will include 3 levels. However, it should be noted that, if necessary, it is possible to increase the number of levels, for example, through the refinement of sub-parameters of the above seven generalised comparison parameters m . While forming a hierarchical model of assessing the tax competitiveness of an enterprise, one should agree with the opinion cited in the literature that a hierarchy can be considered complete provided that each element of the corresponding level functions as a criterion for all elements of a lower level.

The next and one of the most important stages of assessing the tax competitiveness of an enterprise should be its diagnosis of the actual tax policy by certain parameters. It is important to have complete and reliable information regarding all taxes and fees that a business entity pays, regarding its internal tax environment, tax administration, tax risk management system, etc. Evidently, the values of such parameters for each legal entity will differ, because enterprises differ from each other in many ways, in particular, due to legal form, scale and type of activity, size, industry, property structure, sources of its formation, etc. Diagnostics of the tax policy of an enterprise by certain parameters allows to proceed to the next stage of assessing the tax competitiveness of an enterprise – identifying the possibilities of the tax environment. At this stage, one should not merely diagnose such opportunities, but form an ideal tax policy for a business entity in certain conditions of the external tax environment (Melnichuk et al., 2020; Kazambayeva et al., 2019).

The next stage of the generalised sequence of assessing the tax competitiveness of an enterprise should include comparison of the existing tax policy of the organisation with the possibilities of the tax environment by building matrices of pairwise comparisons A . Based on the study of publications on the problem of using the hierarchy analysis method to solve various problems, it is advisable to pay attention to the fact that when building the matrix pairwise comparisons of the parameters of different levels of the hierarchy and the evaluated options, each element of such a_{ij} matrix will have a positive value, that is, $a_{ij} > 0$ for all $ij=1, \dots, n$. With that, the element a_{ij} in

case of assessing the tax competitiveness of the enterprise will indicate the prevalence of option *i* over option *j* on a certain relative scale, which is most often accepted by the Saaty universal nine-point scale (Table 1).

Table 1. Saaty Universal Nine-Point Scale

Importance level	Definition of importance	Characteristics
1	Similar importance	Two actions contribute equally to the achievement of the goal.
3	Certain predominance of the importance of one criterion over another (minor importance)	Experience and judgment suggest the superiority of one criterion over another
5	Significant or strong advantage	Experience and judgments allow to assert a significant advantage of one criterion over another
7	Very strong or obvious advantage	The superiority of one criterion over another is much greater
9	Absolute advantage	Experience and judgments allow to assert the absolute substantial advantage of one criterion over another
2, 4, 6, 8	Intermediate importance values between adjacent scale values	A situation where a compromise solution is needed
Inverse values of the above numbers	If option <i>i</i> , in comparison with option <i>j</i> , is assigned one of the above numbers on a certain scale, then option <i>j</i> is assigned the opposite value compared to option <i>i</i>	Reasoned prediction

It is advisable to emphasise that the Saaty universal nine-point scale presented in Table 1 is scientifically substantiated by E. Weber, G. Fechner and S. Stevenson, as well as the upper limit of this scale of 9 points. Thus, upon assessing the tax competitiveness of an enterprise, the Saaty universal nine-point scale will be somewhat transformed (Table 2).

Table 2. The relative scale of comparison of the existing tax policy of the enterprise with the possibilities of the tax environment, formed on the basis of Saaty’s universal nine-point scale

Scores	Characteristics
1	The tax policy of the company meets all the possibilities of the tax environment
3	The possibilities of the tax environment are slightly greater than the existing tax policy of the enterprise
5	The possibilities of the tax environment are much greater than the existing tax policy of the enterprise
7	The possibilities of the tax environment are substantially greater than the existing tax policy of the enterprise
9	The possibilities of the tax environment are absolutely greater than the existing tax policy of the enterprise
2, 4, 6, 8	Intermediate importance values between adjacent scale values

Results and Discussion

3.1. The developed methodology for assessing the tax competitiveness of the enterprise

During the formation of matrixes of pairwise comparisons within the framework of assessing the tax competitiveness of an enterprise, it is advisable to pay attention to the fact that at the intersection of a row of a matrix *A* with a column of the same matrix in position (*A*, *A*) the value will be 1, therefore, the main diagonal of the matrix will reflect units, which is known from the theoretical and practical justification for the use of the hierarchy analysis method. The generalised corresponding propositional matrix *A* will look as follows (Eq. 2):

$$A = \begin{bmatrix} 1 & a_{12} & \dots & a_{1j} & \dots & a_{1n} \\ a_{21} & 1 & \dots & a_{2j} & \dots & a_{2n} \\ \dots & \dots & 1 & \dots & \dots & \dots \\ a_{i1} & a_{i2} & \dots & 1 & \dots & a_{in} \\ \dots & \dots & \dots & \dots & 1 & \dots \\ a_{n1} & a_{n2} & \dots & a_{nj} & \dots & 1 \end{bmatrix} \quad (2)$$

where A – matrix of pairwise comparisons for each of the comparison parameters; a_{ij} – inverse symmetric matrix elements A , which show the relative prevalence of option i over option j (where the indices i and j refer to the row and column of the matrix, respectively); n – number of comparison options. Generalized matrices of pairwise comparisons have dimension $n \times n$ are described as follows (Eq. 3):

$$A = (a_{ij}), i, j = 1, 2, \dots, n \quad (3)$$

where n – number of comparison options. Considering the information presented in Tables 1 and 2, it should be noted that in any case if $a_{ij}=a$, $a_{ji}=1/a$ or, in other words, if $a_{12} \equiv \alpha$, $a_{21} = 1/\alpha$, $\alpha \neq 0$. Furthermore, as noted above, if the generalized comparison parameter has identical relative importance with respect to m_i then m_j , $a_{ij} = 1$ $a_{ji} = 1$. In our case, it is true that if the generalised comparison parameter m_1 has a similar relative importance with respect to m_2 , then $a_{12} = 1$ and $a_{21} = 1$. It is worth noting that each element a_{ij} of the matrix A can be represented as a correlation (Eq. 4):

$$a_{ij} = \frac{\omega_i}{\omega_j}, i, j = 1, 2, \dots, n \quad (4)$$

where ω_{ij} – relative prevalence of option i over option j . Based on the foregoing, equation (3) can be represented in the following form (Eq. 5):

$$A = (a_{ij}), a_{ii} = 1, a_{ji} = \frac{1}{a_{ij}}, i, j = 1, 2, \dots, n \quad (5)$$

It must be emphasized that in case of increasing levels of the hierarchical structure upon assessing the tax competitiveness of an enterprise, matrixes of pairwise comparisons should be formed at each such level. The next stage in assessing the tax competitiveness of an enterprise is the determination of eigenvectors and their normalised estimates for each matrix of pairwise comparisons in order to obtain priority vectors. As is known from the theory and practice of using the hierarchy analysis method, the elements of eigenvectors for each matrix of pairwise comparisons x are calculated by the formula of the average geometric rows of matrix A (Eq. 6):

$$x_i = \sqrt[n]{\prod_{j=1}^n a_{ij}}, i, j = 1, 2, \dots, n \quad (6)$$

where x_i – i value of an element of the eigenvector of the matrix of pairwise comparisons. In turn, the normalised estimate of the i^{th} value of the element of the eigenvector of the matrix of pairwise comparisons y is calculated according to the following formula (Eq. 7):

$$y_i = \frac{x_i}{\sum_{i=1}^n x_i} \quad (7)$$

where y_i – normalised estimate of the i^{th} value of the element of the priority vector. Since according to the formula (7), the i^{th} value of the element of the priority vector is normalised, the following equality will be valid (Eq. 8):

$$\sum_{i=1}^n y_i = 1 \quad (8)$$

It should be noted that under certain conditions, when assessing the tax competitiveness of an enterprise, the consistency of matrices of pairwise comparisons can also be assessed by calculating the consistency index I_U . It allows to identify cases of numerical (cardinal $a_{ij}a_{jk} = a_{ik}$) and transitive (ordinal) consistency, which can lead to a violation of consistency as such. This situation occurs when, according to experts, option i is better than option j , option j is better than option k , however option k is better than option i .

Most often, the reason for this is the proximity of the values of the analysed options. With that, it is obvious that, subject to analysis upon assessing the tax competitiveness of an enterprise, only two options for such a violation of the level of consistency will not occur (in other words, for pairwise comparisons of the second level, the consistency index is zero). Despite that, if in the future, apart from the tax policy of the enterprise and the possibilities of the tax environment, for example, the tax policy of a competitor is also analysed, the consistency index will need to be calculated. Calculation of such an index is also necessary to determine the row vector of weighting coefficients when using more than two comparison parameters (in our case there are seven). This index is calculated using the formula below (Eq. 9):

$$I_u = \frac{\gamma_{max} - n}{n - 1} \quad (9)$$

where γ_{max} – maximum eigenvalue of the matrix of pairwise comparisons; I_u – consistency index. In turn, the maximum eigenvalue of the matrix of pairwise comparisons γ_{max} is calculated as follows (Eq. 10):

$$\gamma_{max} \approx \sum_{j=1}^n y_j \left(\sum_{i=1}^n a_{ij} \right) \quad (10)$$

The theory of hierarchy analysis proves that for an inversely symmetric matrix, always $\gamma_{max} \geq n$. At the stage of assessing the consistency of matrices of pairwise comparisons, one should also consider the consistency relation and calculate the index of the consistency relation V_u , which is justified in the work of T. Saaty. The author understands it as the relation of the consistency index I_u with the random consistency index V_{iu} , the value of which is justified for matrices 1 to 15 based on 100 random samples at the Oakridge National Laboratory and is presented in Table 3.

Table 3. The value of the random consistency index V_{iu} of the matrices of pairwise comparisons

Matrix order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
V_{iu} values	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

Under the condition $V_u \leq 0.10$, it is possible to state the consistency of estimates. Under other conditions, experts should return to the previous stages. The construction of a generalised vector of priorities is the next step in the generalised sequence of assessing the tax competitiveness of an enterprise. At this stage, one should actually “integrate” the constructed priority vectors into one final vector, considering the number of hierarchy levels. The option proposed above involves the integration of seven matrices of pairwise comparisons of the 2nd level with respect to comparison options of the 3rd level, factoring in the matrix of comparisons of such parameters with each other to identify a normalised estimate of the priority vector or, in other words, to factor in their weighting coefficients. As is known from the theory of using the hierarchy analysis method, at this stage, to construct a generalised vector of priorities, several operations should be performed with matrices, namely, multiplication of the combined normalised matrix of estimates of elements of priority vectors by a transposed row vector of weight coefficients.

The final stage of the generalised sequence of assessing the tax competitiveness of an enterprise should include the formation of conclusions and recommendations that can relate to both competitiveness in general and the improvement of the parameters that form it at different levels. Considering the above, it is possible to draw a general conclusion that assessing the tax competitiveness of an enterprise can be considered a rather complicated process, which requires both an understanding of all the in-depth knowledge of the current tax legislation and the ability to “design” the actual tax policy of a business entity. Recommended methodological provisions allow, if necessary, to include a greater number of levels in the hierarchy, which reflect various aspects of the tax policy of the enterprise. Despite this, a rather simple mathematical apparatus allows to obtain reasonable conclusions for the adoption of various managerial decisions to ensure the multi-vector development of business entities on the principles of using tax leverage. With that, all structural and functional relations between various elements of the tax policy of the enterprise will be retained and factored in.

3.2. Analysis of the proposed methodology for assessing the tax competitiveness of enterprises

The application of the proposed provisions for assessing the tax competitiveness of enterprises is carried out on the example of LLC “Vektor”. The expert group for assessing such tax competitiveness included 7 experts, 4 of whom were representatives of “Audit Company “Kontrol” LLC, and the rest were specialists from state control and audit. All experts have in-depth knowledge in taxation of the activities of subjects of entrepreneurial activity, extensive practical experience, as well as experience in consulting business representatives on this subject area. The number of experts was substantiated based on scientific provisions. The statement of the problem and its structuring in the form of hierarchies is performed similarly to the generalised sequence of assessing tax competitiveness. The number of comparison parameters considered by the expert group was also seven (taxpayers, tax objects and the tax base, tax calculation procedure, tax periods, tax rates, dates of occurrence of tax obligations, as well as the timing and procedure for paying taxes). Specification of these comparison parameters at the lower levels of the hierarchy was not carried out.

Diagnostics of the tax policy of “Vektor” LLC by certain parameters for comparing the possibilities of the external tax environment, as well as designing an ideal tax policy for the company, was carried out with the use of a combination of methods such as collective notebook, expert focusing, and brainstorming, with the participation

of all experts of the working group for 23 days. The expert competence coefficient was not calculated. To form a generalised assessment of experts in the context of each comparison parameter, the method of average values was used. During the study, the Saaty relative scale was used, which is presented in Table 2. As a result, a number of pairwise comparison matrices were obtained for each of seven such parameters, the first of which is the matrix for the parameter “Taxpayers” (Table 4).

Table 4. Matrix of pairwise comparisons for LLC “Vektor” according to the parameter “taxpayers”

“Taxpayers” parameter	Enterprise Tax Policy	Perfect tax policy	Normalised assessment of the elements of the enterprise vector y_i
Enterprise Tax Policy	1	1/3	0.250
Ideal tax environment tax policy	3	1	0.750
$\gamma_{max} = 2.00$			

According to formulas (6) and (7), we shall obtain the following:

$$x_1 = \sqrt[3]{\frac{1}{3} \times 1} = 0.577 \tag{11}$$

$$x_2 = \sqrt[3]{1 \times 3} = 1.732 \tag{12}$$

$$\sum_{i=1}^2 1.732 + 0.577 = 2.309 \tag{13}$$

$$y_1 = \frac{0.577}{2.309} = 0.250 \tag{14}$$

$$y_2 = \frac{1.732}{2.309} = 0.750 \tag{15}$$

Using formula (10), we shall calculate the maximum eigenvalue of the matrix of pairwise comparisons γ_{max} :

$$\gamma_{max} = 0.750 \times \left(1 + \frac{1}{3}\right) + 0.250 \times (3 + 1) = 2.00 \tag{16}$$

We shall provide similar calculation results relative to other comparison parameters at the third level (Tables 5-10).

Table 5. Matrix of pairwise comparisons for LLC “Vektor” according to the parameter “tax objects and tax bases”

“Tax objects and tax bases” parameter	Enterprise Tax Policy	Perfect tax policy	Normalised assessment of the elements of the enterprise vector y_i
Enterprise Tax Policy	1	1/5	0.167
Ideal tax environment tax policy	5	1	0.833
$\gamma_{max} = 2.00$			

According to formulas (6), (7) and (10), we shall obtain the following:

$$x_1 = \sqrt[2]{\frac{1}{5} \times 1} = 0.447 \tag{17}$$

$$x_2 = \sqrt[2]{1 \times 5} = 2.236 \tag{18}$$

$$\sum_{i=1}^2 2.236 + 0.447 = 2.683 \tag{19}$$

$$y_1 = \frac{0.447}{2.683} = 0.167 \tag{20}$$

$$y_2 = \frac{2.236}{2.683} = 0.833 \tag{21}$$

$$\gamma_{max} = 0.833 \times \left(1 + \frac{1}{5}\right) + 0.167 \times (5 + 1) = 2.00 \tag{22}$$

Table 6. Matrix of pairwise comparisons for LLC “Vector” according to the parameter “procedure for calculating taxes”

“Procedure for calculating taxes” parameter	Enterprise Tax Policy	Perfect tax policy	Normalised assessment of the elements of the enterprise vector y_i
Enterprise Tax Policy	1	1/7	0.125
Ideal tax environment tax policy	7	1	0.875
$\gamma_{max} = 2.00$			

According to formulas (6), (7) and (10), we shall obtain the following:

$$x_1 = \sqrt[2]{\frac{1}{7} \times 1} = 0.378 \tag{23}$$

$$x_2 = \sqrt[3]{1 \times 7} = 2.646 \tag{24}$$

$$\sum_{i=1}^2 2.646 + 0.378 = 3.024 \tag{25}$$

$$y_1 = \frac{0.378}{3.024} = 0.125 \tag{26}$$

$$y_2 = \frac{2.646}{3.024} = 0.875 \tag{27}$$

$$y_{max} = 0.875 \times \left(1 + \frac{1}{7}\right) + 0.125 \times (7 + 1) = 2.00 \tag{28}$$

Table 7. Matrix of pairwise comparisons for LLC “Vektor” according to the parameter “tax periods”

“Tax periods” parameter	Enterprise Tax Policy	Perfect tax policy	Normalised assessment of the elements of the enterprise vector y_i
Enterprise Tax Policy	1	1/7	0.125
Ideal tax environment tax policy	7	1	0.875
$y_{max} = 2.00$			

According to formulas (6), (7) and (10), we shall obtain the following:

$$x_1 = \sqrt[3]{\frac{1}{7} \times 1} = 0.378 \tag{29}$$

$$x_2 = \sqrt[3]{1 \times 7} = 2.646 \tag{30}$$

$$\sum_{i=1}^2 2.646 + 0.378 = 3.024 \tag{31}$$

$$y_1 = \frac{0.378}{3.024} = 0.125 \tag{32}$$

$$y_2 = \frac{2.646}{3.024} = 0.875 \tag{33}$$

$$\gamma_{max} = 0.875 \times \left(1 + \frac{1}{7}\right) + 0.125 \times (7 + 1) = 2.00 \tag{34}$$

Table 8. Matrix of pairwise comparisons for LLC “Vektor” according to the parameter “tax rates”

“Tax rates” parameter	Enterprise Tax Policy	Perfect tax policy	Normalised assessment of the elements of the enterprise vector y_i
Enterprise Tax Policy	1	1/4	0.200
Ideal tax environment tax policy	4	1	0.800
$\gamma_{max} = 2.00$			

According to formulas (6), (7) and (10), we shall obtain the following:

$$x_1 = \sqrt[3]{\frac{1}{4} \times 1} = 0.500 \tag{35}$$

$$x_2 = \sqrt[3]{1 \times 4} = 2.000 \tag{36}$$

$$\sum_{i=1}^2 2.000 + 0.500 = 2.500 \tag{37}$$

$$y_1 = \frac{0.500}{2.500} = 0.200 \tag{38}$$

$$y_2 = \frac{2.000}{3.500} = 0.800 \tag{39}$$

$$\gamma_{max} = 0.800 \times \left(1 + \frac{1}{4}\right) + 0.200 \times (4 + 1) = 2.00 \tag{40}$$

Table 9. Matrix of pairwise comparisons for LLC “Vektor” according to the parameter “terms and procedure for paying taxes”

“Terms and procedure for paying taxes” parameter	Enterprise Tax Policy	Perfect tax policy	Normalised assessment of the elements of the enterprise vector y_i
Enterprise Tax Policy	1	1/3	0.250
Ideal tax environment tax policy	3	1	0.750
$\gamma_{max} = 2.00$			

According to formulas (6), (7) and (10), we shall obtain the following:

$$x_1 = \sqrt[3]{\frac{1}{3} \times 1} = 0.577 \tag{41}$$

$$x_2 = \sqrt[3]{1 \times 3} = 1.732 \tag{42}$$

$$\sum_{i=1}^2 1.732 + 0.577 = 2.309 \tag{43}$$

$$y_1 = \frac{0.577}{2.309} = 0.250 \tag{44}$$

$$y_2 = \frac{1.732}{2.309} = 0.750 \tag{45}$$

$$\gamma_{max} = 0.750 \times \left(1 + \frac{1}{3}\right) + 0.250 \times (3 + 1) = 2.00 \tag{46}$$

Table 10. Matrix of pairwise comparisons for LLC “Vektor” according to the parameter “dates of occurrence of tax obligations”

“Dates of occurrence of tax obligations” parameter	Enterprise Tax Policy	Perfect tax policy	Normalised assessment of the elements of the enterprise vector y_i
Enterprise Tax Policy	1	1/9	0.100
Ideal tax environment tax policy	9	1	0.900
$\gamma_{max} = 2.00$			

According to formulas (6), (7) and (10), we shall obtain the following:

$$x_1 = \sqrt[3]{\frac{1}{9} \times 1} = 0.333 \tag{47}$$

$$x_2 = \sqrt[3]{1 \times 9} = 3.000 \tag{48}$$

$$\sum_{i=1}^2 3.000 + 0.333 = 3.333 \tag{49}$$

$$y_1 = \frac{0.333}{3.333} = 0.100 \tag{50}$$

$$y_2 = \frac{3.000}{3.333} = 0.900 \tag{51}$$

$$\gamma_{max} = 0.900 \times \left(1 + \frac{1}{9}\right) + 0.100 \times (9 + 1) = 2.00 \tag{52}$$

Apart from the above matrices of pairwise comparisons for 3rd level parameters, the expert group also built a matrix for 2nd level parameters (Table 11).

Table 11. The general matrix of pairwise comparisons for LLC “Vektor” relative to the 2nd level parameters

2 nd level parameters	Taxpayers	Tax objects and tax bases	Tax calculation procedure	Tax periods	Tax rates	Terms and procedure for paying taxes	Dates of occurrence of tax obligations	Normalised assessment of elements of priority vector y_i
Taxpayers	1	3	1	1	3	1/3	1/3	0.120
Tax objects and tax bases	1/3	1	1/3	1	1/3	1	1/3	0.064
Tax calculation procedure	1	3	1	3	3	1	1/5	0.153
Tax periods	1	1	1/3	1	1	1	1/5	0.081
Tax rates	1/3	3	1/3	1	1	1	1/3	0.087
Terms and procedure for paying taxes	3	1	1	1	1	1	1/5	0.112
Dates of occurrence of tax obligations	3	3	5	5	3	5	1	0.383
$\gamma_{max} = 7.788$ $I_w = 0.131$ $V_i = 0.099$								

According to formulas (6), (7) and (10), we shall obtain the following:

$$x_1 = \sqrt[7]{1 \times 3 \times 1 \times 1 \times 3 \times \frac{1}{3} \times \frac{1}{3}} = 1.000 \tag{53}$$

$$x_2 = \sqrt[7]{\frac{1}{3} \times 1 \times \frac{1}{3} \times 1 \times \frac{1}{3} \times 1 \times \frac{1}{3}} = 0.534 \tag{54}$$

$$x_3 = \sqrt[7]{1 \times 3 \times 1 \times 3 \times 3 \times 1 \times \frac{1}{5}} = 1.272 \tag{55}$$

$$x_4 = \sqrt[7]{1 \times 1 \times \frac{1}{3} \times 1 \times 1 \times 1 \times \frac{1}{5}} = 0.679 \quad (56)$$

$$x_5 = \sqrt[7]{\frac{1}{3} \times 3 \times \frac{1}{3} \times 1 \times 1 \times 1 \times \frac{1}{3}} = 0.731 \quad (57)$$

$$x_6 = \sqrt[7]{3 \times 1 \times 1 \times 1 \times 1 \times 1 \times \frac{1}{5}} = 0.929 \quad (58)$$

$$x_7 = \sqrt[7]{3 \times 3 \times 5 \times 5 \times 3 \times 5 \times 1} = 3.192 \quad (59)$$

$$\sum_{i=1}^7 1.000 + 0.534 + 1.272 + 0.679 + 0.731 + 0.929 + 3.192 = 8.337 \quad (60)$$

$$y_1 = \frac{1.000}{8.337} = 0.120 \quad (61)$$

$$y_2 = \frac{0.534}{8.337} = 0.064 \quad (62)$$

$$y_3 = \frac{1.272}{8.337} = 1.153 \quad (63)$$

$$y_4 = \frac{0.679}{8.337} = 0.081 \quad (64)$$

$$y_5 = \frac{0.731}{8.337} = 0.088 \quad (65)$$

$$y_6 = \frac{0.929}{8.337} = 0.112 \quad (66)$$

$$y_7 = \frac{3.192}{8.337} = 0.383 \quad (67)$$

$$\begin{aligned}
 \gamma_{max} = & 0.120 \times \left(1 + \frac{1}{3} + 1 + 1 + \frac{1}{3} + 3 + 3\right) + 0.064 \times (3 + 1 + 3 + 1 + 3 + 1 + 3) + \\
 & + 0.153 \times \left(1 + \frac{1}{3} + 1 + \frac{1}{3} + \frac{1}{3} + 1 + 5\right) + 0.081 \times (1 + 1 + 3 + 1 + 1 + 1 + 5) + \\
 & + 0.088 \times \left(3 + \frac{1}{3} + 3 + 1 + 1 + 1 + 1 + 3\right) + 0.112 \times \left(\frac{1}{3} + 1 + 1 + 1 + 1 + 1 + 5\right) + \\
 & + 0.383 \times \left(\frac{1}{3} + \frac{1}{3} + \frac{1}{5} + \frac{1}{5} + \frac{1}{3} + \frac{1}{5} + 1\right) = 7.788
 \end{aligned} \tag{67}$$

$$I_u = \frac{\gamma_{max} - n}{n - 1} = \frac{7.788 - 7}{7 - 1} = 0.131 \tag{68}$$

$$V_u = \frac{I_u}{V_{iu}} = \frac{0.131}{1.32} = 0.099 \tag{69}$$

Thus, the value of the consistency ratio index V_u calculated by experts is within the previously indicated acceptable limits ($V_u \leq 0.10$), which allows to confirm the consistency of expert opinions on tax competitiveness of “Vektor” LLC against the background of market opportunities. At the stage of constructing a generalised vector of priorities, the members of the expert group multiplied the normalised summary matrix of estimates of the elements of the priority vectors by the transposed vector row of weight coefficients, which can be represented in the form of a matrix (Eq. 12):

$$\begin{bmatrix} 0.250 & 0.167 & 0.125 & 0.125 & 0.200 & 0.250 & 0.100 \\ 0.750 & 0.833 & 0.875 & 0.875 & 0.800 & 0.750 & 0.900 \end{bmatrix} \begin{bmatrix} 0.120 \\ 0.064 \\ 0.153 \\ 0.081 \\ 0.087 \\ 0.112 \\ 0.383 \end{bmatrix} \tag{70}$$

As a result of the calculations, a set of normalised estimates were obtained (Table 12), which allow to form a holistic view of the tax competitiveness of “Vektor” LLC.

Table 12. The generalised results of the assessment of tax competitiveness of LLC “Vektor”

Comparison options	Comparison parameters, their weighting coefficients and normalised assessments of the elements of priority vectors							Final assessments
	Taxpayers (0.120)	Tax objects and tax bases (0.064)	Tax calculation procedure (0.153)	Tax periods (0.081)	Tax rates (0.087)	Terms and procedure for paying taxes (0.112)	Dates of occurrence of tax obligations (0.383)	
Enterprise Tax Policy	0.250	0.167	0.125	0.125	0.200	0.250	0.100	0.154
Ideal tax environment tax policy	0.750	0.833	0.875	0.875	0.800	0.750	0.900	0.846

Conclusions

Thus, according to the results of calculations, we can conclude that the tax policy of any enterprise can be considered maximally competitive (that is, one that maximises the potential of the tax environment), provided that either partial normalised assessments of the elements of the priority vector, or a generalised priority vector with consideration of weighting factors illustrates the ratio of 50x50. All other “imbalances” in favour of the possibilities of the tax environment automatically cause a decrease in the assessment of the tax competitiveness of a subject of entrepreneurial activity and a decrease in its level. In the case of “Vektor” LLC, it is obvious that its level of tax competitiveness is significantly lower than the potential of the external tax environment (generalised by 34.6%). This is despite the fact that according to certain parameters of competitiveness, the company did not use about 40% of market opportunities (for example, the dates of tax liabilities). Identification of the existing gaps between the actual and the maximum possible state allows “Vektor” LLC to generate conclusions and recommendations on ways to increase its tax competitiveness.

The results of assessing the tax competitiveness of an enterprise can be one of the information sources for improving the tax policy of a subject of entrepreneurial activity, ensuring a higher level of dynamism, which, in general, will allow to obtain sustainable competitive advantages by optimising tax payments. Furthermore, such results constitute the basis for the adoption of various management decisions to increase the level of tax competitiveness of a subject of entrepreneurial activity by influencing certain parameters that form such competitiveness. The proposed approach allows to identify both strong and weak positions of the actual tax competitiveness of enterprises. Improvement of the tax competitiveness of enterprises for domestic business should be one of the priority tasks on the path to ensuring multi-vector development.

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