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**THE SYSTEM APPROACH TO THE
ASSESSMENT OF ANTI-CRISIS
SUSTAINABILITY OF THE ENTERPRISE**

**СИСТЕМНИЙ ПІДХІД ДО ОЦІНЮВАННЯ
АНТИКРИЗОВОЇ СТІЙКОСТІ ПІДПРИЄМСТВА**

Urgency of the research. In conditions of negative changes in the external environment, anti-crisis stability plays a significant role in ensuring long-term effective business activity.

Target setting. Anticrisis firmness is a complex system that is quite difficult to formalize. This requires the use of a systematic approach of assessing the crisis-proof sustainability of the enterprise, which will provide entrepreneurs with effective tools to ensure the stability of operations in crisis conditions.

Actual scientific researches and issues analysis. Apart from the attention of those and other scientists, the problem of assessing the anti-crisis stability of the enterprise remains in the competitive environment.

Uninvestigated parts of general matters defining. Theoretical-methodological and practical principles of anti-crisis activity of the enterprise are devoted to the work of many leading researchers: Gradova A. P., Gryaznova A. G., Ligonenko L. O., Tereshchenko O. O., Shershnyova Z. Y. The issues of ensuring the stability of enterprises were reflected in the works: Boyko A. V., Broilo O. V., Grigoryan K. S., Yachmenova V. M.

The research objective. Applying a systematic approach of assessing the anti-crisis strength of the company in order to create a qualitative analytical and practical basis for ensuring the anti-crisis sustainability of the company in the long run.

The statement of basic materials. The essence of the systematic approach of assessing the anti-crisis stability of the company in a competitive environment is revealed, which is taking into account the existing possibilities of providing external anti-crisis stability and anti-crisis stability of the functional subsystems of the enterprise with simultaneous improvement of the competitive position, that allows to provide models of enterprises according to the resulting index of competitive position and the level of systemic provision of anti-crisis stability. Enterprises.

Conclusions. The resulting indicator of a competitive position in terms of providing anti-crisis stability of the enterprise allows comparative analysis in time and space, when it can reflect the actual level of competitive position in terms of providing anti-crisis stability of the enterprise.

Keywords: assessment of anti-crisis stability; vector of competitive position; level of system support; components of crisis-proofing stability.

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Актуальність теми дослідження. В умовах негативних змін у зовнішньому середовищі антикризова стійкість відіграє визначну роль в забезпеченні довгострокової ефективної діяльності підприємства.

Постановка проблеми. Антикризова стійкість підприємства є складною системою, яка досить важко піддається формалізації. Це вимагає застосування системного підходу до оцінювання антикризової стійкості підприємства, який забезпечить підприємців дієвим інструментарієм забезпечення стійкості функціонування в кризових умовах.

Аналіз останніх досліджень і публікацій. Теоретико-методологічним та практичним засадам антикризової діяльності підприємства присвячені праці багатьох провідних дослідників: Градова А. П., Грязнової А. Г., Лігоненко Л. О., Терещенко О. О., Шершньової З. Є. Питання забезпечення стійкості підприємств знайшли відображення в працях: Бойко А. В., Броїло О. В., Григорян К. С., Ячменьової В. М.

Виділення недосліджених частин загальної проблеми. Поза увагою тих та інших вчених залишається проблема оцінювання антикризової стійкості підприємства в конкурентному середовищі.

Постановка завдання. Застосування системного підходу до оцінювання антикризової стійкості підприємства з метою створення якісного аналітико-практичного підґрунтя забезпечення антикризової стійкості підприємства в довгостроковій перспективі.

Викладення основного матеріалу. Розкривається сутність системного підходу до оцінювання антикризової стійкості підприємства в конкурентному середовищі, який полягає у врахуванні існуючих можливостей забезпечення зовнішньої антикризової стійкості та антикризової стійкості функціональних підсистем підприємства з одночасним покращенням конкурентних позицій, що дозволяє типізувати підприємства за результируючим показником конкурентної позиції та рівнем системного забезпечення антикризової стійкості підприємства.

Висновки відповідно до статті. Результируючий показник конкурентної позиції за рівнем забезпечення антикризової стійкості підприємства дозволяє проведення порівняльного аналізу у часі та просторі, у межах яких він може відображати дійсний рівень конкурентної позиції за рівнем забезпечення антикризової стійкості підприємства.

Ключові слова: оцінювання антикризової стійкості; вектор конкурентної позиції; рівень системного забезпечення; складові антикризової стійкості.

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Urgency of the research. In conditions of negative changes in the external environment threatening the normal functioning of enterprises, an important task is to ensure the anti-crisis stability of the enterprise. In today's economy, crisis-proof sustainability plays an important role in ensuring long-term effective business performance in a competitive environment. Anticrisis sustainability is one of the main economic categories, on the basis of which all the management measures for the operation and development of the enterprise are developed. One of the main steps in ensuring the anti-crisis stability of the company is its regular assessment. The basic principle that defines the rules that form the approach of assessing the anti-crisis stability of the enterprise is the system of evaluation (evaluation of each component of the crisis-proof firmness as a complex economic system in the connection with themselves and with the competitive environment). In this regard, there is a need to use a systematic approach of assessing the company's anti-crisis sustainability.

Target setting. Anticrisis firmness is a complex system that is quite difficult to formalize. This requires the application of a systematic approach of assessing the company anti-crisis sustainability, which provides entrepreneurs with effective tools to ensure the sustainability of their operations in crisis conditions.

Actual scientific researches and issues analysis. The theoretical and methodological principles of the anti-crisis activity of the enterprise are devoted to the work of such leading researchers as I. O. Blank, V. O. Vasilenko, A. G. Hriaznov, T. S. Klebanov, L. O. Ligonenko, A. I. Maslak, O. O. Tereshchenko, Z. E. Shershnev and others. Questions concerning the sustainability of enterprises were investigated in the works by O. B. Blilo, K. S. Hrihorian, D. S. Kondaurovoy, O. V. Semenenko, V. M. Yachmeneva, M. S. Yashin and others. The question of the essence of anti-crisis stability of the enterprise is developed by V. O. Rohova and L. V. Urivskaia.

The research objective. The purpose of this article is to develop a systematic approach of assessing the anti-crisis stability of the enterprise, which creates a qualitative analytical and practical basis for providing anti-crisis stability of the enterprise in the long-term perspective.

The statement of basic materials. In the domestic literature there is no single formula for calculating the level of anti-crisis stability of the enterprise. The most detailed approach of researchers to the assessment of sustainability is considered in the economic literature only on an example of financial, economic, strategic stability. The results of the research showed that the approaches of scientists to assess the stability of the enterprise are diverse and versatile, which manifests itself in the purpose and directions, methods, means and depth of evaluation, in the choice of the result indicator, etc. Anti-crisis stability characterizes the state of the economic system in relation with external and internal crisis phenomena. A more stable system is that, which is equal to external influences and internal shifts, it inclined to smaller changes. From this, we can conclude that one of the main conditions for ensuring the crisis-proof stability of the enterprise as an economic system is its internal properties. Thus, anti-crisis stability is an external manifestation of the internal structure of the system.

That is why, in assessing the anti-crisis stability it is expedient, in our opinion, to evaluate not only the properties of the enterprise, which are aimed at the internal environment, but also properties that characterize the interaction with the external environment - external anti-crisis stability. The general anti-crisis stability of the enterprise is a compound concept, which is characterized by a system of indicators reflecting the internal crisis management enterprise and its interaction with the external environment. Dedicated groups of indicators can be divided into two groups, which will characterize the internal and external anti-crisis stability of the enterprise. The formation of indicators of the "External anti-crisis stability" block is necessary to characterize the degree of anti-crisis stability of the enterprise in relation with the factors of meso-targeting: anti-crisis resistance to partners, anti-crisis resistance to demand for products, anti-crisis resistance to competitors. Proceeding from the author's definition of the content about the anti-crisis stability of the enterprise [1] as a complex characteristic of the enterprise, which reflects the ability of the enterprise to maintain in the long term of a gradual improvement of competitive positions in the market under the influence of a combination of factors of the crisis in a competitive environment, ensuring the overall anti-crisis stability of the enterprise - this continuous cyclical process of providing anti-crisis stability of functional subsystems of this enterprise within existing facilities providing anti-crisis external storage stability with a view to long-term gradual improve-

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ment of competitive position. Internal anti-crisis resistance of enterprise means the coordination of all its functional subsystems (crisis-resistant operating, marketing, personnel, financial-investment, innovation, organizational-managerial and innovative functional subsystems). The combination of certain components in aggregate characterizes the state and capabilities of the enterprise to maintain in the long run a gradual improvement of competitive positions in the market under the influence of a combination of emergence factors of a crisis in a competitive environment. Thus, the indicator of the competitive position of the company is an integrated assessment that takes into account all the local components of the anti-crisis stability.

In dynamic market conditions, this may cause a distorted perception of the real state of the enterprise. If, during the crisis, a significant number of small enterprises bankrupt and leaves the market, from the crisis, there are losses and large competitors, but the relative quantitative assessment of its competitive position increases [2, p. 135].

In our opinion, a more conspicuous and qualitative assessment is the assessment of the company's competitive position with respect to the "absolutely anticrisis-resistant competitor", in which each local component of the anti-crisis stability is given the maximum, that is, as 100%.

In accordance to the basic requirements of the system evaluation, including information completeness and adequacy of the use of interrelated indicators of subjective evaluation, in the course of the study we have adapted a universal methodological approach for measuring the length (norm) of the vector and the angle between the vectors [3, p. 12] to assess the anti-crisis stability of the enterprise.

The study provides a systematic approach to assessing the company's anti-crisis strength, in which 52 out of 58 components of the evaluation component are calculated on the basis of indicators used in planning, accounting and analysis of enterprises. At the same time, 6 elements are determined on the basis of expert evaluation. The determination of the consistency of expert opinions was carried out using the coefficient of variation, the level of which allows to confirm the reliability of the estimates and consistency of expert opinions.

The indicator of the competitive position of the company in terms of providing external anti-crisis stability should be evaluated in the space of three dimensions: assessing the level of external anti-crisis resilience to partners (I_{PAS}), assessing the level of external anti-crisis resistance to competitors (I_{CAS}), assessing the level of external anti-crisis resistance to consumers (in terms of demand for products) (I_{DPAC}). This indicator is a vector whose norm is determined by the indicator of the competitive position of the company by the level of providing external anti-crisis stability. Its same spatial position in the coordinate system (I_{APAS} , I_{CAS} , I_{DPAS}) characterizes the level of system security of the company's competitive stability in a competitive environment (SAA). Vector Competitive Position (CP_{PEAS}) on the level of providing external anti-crisis stability proposed to calculate by the formula:

$$|\overrightarrow{CP_{PEAS}}| = \sqrt{(I_{PAS}^2 + I_{CAS}^2 + I_{DPAS}^2)}, \quad (1)$$

where $|\overrightarrow{CP_{PEAS}}|$ - a vector of competitive position in terms of providing external anti-crisis stability of the enterprise.

The vector of competitive position (CP_{PIAS}) on the level of providing internal anti-crisis stability is proposed to calculate by the formula:

$$|\overrightarrow{CP_{PIAS}}| = \sqrt{(I_{OAS}^2 + I_{MAS}^2 + I_{FIAS}^2 + I_{FAS}^2 + I_{IAS}^2 + I_{ManAS}^2 + I_{InfAS}^2)}, \quad (2)$$

where I_{OAS} - the importance of assessing the level of operational stability of the crisis; I_{MAS} - the importance of assessing the level of market anti-crisis stability; I_{FIAS} - the importance of assessing the level of financial and investment anti-crisis stability; I_{FAS} - the value of assessing the level of personnel security anti-crisis stability; I_{AAS} - the value of assessing the level of innovation anti-crisis stability; I_{MAAS} - the importance of assessing the level of management's anti-crisis stability; I_{InfAS} - the value of assessing the level of information security anti-crisis stability.

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The vector of the competitive position of "absolutely anticrisis-resistant" enterprise is a vector with maximum coordinates, which is equidistant from each of the coordinates of the enterprise:

- by the level of providing external anti-crisis stability of the enterprise:

$$|\overrightarrow{CP(ABS)_{PEAS}}| = \sqrt{(1^2 + 1^2 + 1^2)} = \sqrt{3}; \tag{3}$$

- by the level of providing internal anti-crisis stability of the enterprise:

$$|\overrightarrow{CP(ABS)_{PIAS}}| = \sqrt{(1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 1^2)} = \sqrt{7}. \tag{4}$$

The index of competitive position of the i-th enterprise (CPI) on the level of providing anti-crisis stability is proposed to calculate by the formula:

$$CPI_i = \frac{|\overrightarrow{CP_i}|}{|\overrightarrow{CP(ABS)}|}, \tag{5}$$

where $|\overrightarrow{CP_i}|$ - the vector of a competitive position on the level of anti-crisis stability of the i-th enterprise;

$|\overrightarrow{CP(ABS)}|$ - a vector of a competitive position "absolutely anticrisis-resistant" competitor on the level of providing anti-crisis stability of the enterprise.

Determination of the value of a competitive position gives an opportunity to quantitatively determine its level of growth, that is, to assess the level of systemic provision of anti-crisis stability of the enterprise. The level of systemic provision of anti-crisis stability of the enterprise is determined by the deviation of the vector of the competitive position of the enterprise from the vector of the competitive position "absolutely anti-crisis stable" by the levels of ensuring anti-crisis stability. In order to assess the level of system security of the company's anti-crisis stability (S_{ASE}), it is necessary to determine the value of the angle between the vector of the company's competitive position and the vector of a completely anti-crisis firm on the levels of anti-crisis stability.

The angle is measured in degrees and is determined by the ratio:

- for the external anti-crisis stability of the enterprise:

$$\alpha = \arccos \frac{I_{PAS} + I_{CAS} + I_{DPAS}}{\sqrt{3} \cdot \sqrt{I_{PAS}^2 + I_{CAS}^2 + I_{DPAS}^2}}. \tag{6}$$

Angle varies within:

- for the internal anti-crisis stability of the enterprise:

$$\alpha = \arccos \frac{I_{OAS} + I_{MAS} + I_{FIAS} + I_{FAS} + I_{ManAS} + I_{InIAS} + I_{IAS}}{\sqrt{7} \cdot \sqrt{I_{OAS}^2 + I_{MAS}^2 + I_{FIAS}^2 + I_{FAS}^2 + I_{ManAS}^2 + I_{InIAS}^2 + I_{IAS}^2}}. \tag{7}$$

The angle varies within: As this angle approaches 0, the level of system security of the company's anti-crisis stability will increase.

We offer the level of systemic anti-crisis stability of the enterprise (S_{ASE}^{comp}) to count not only from the position of diagnostics of the internal environment of the operation of the enterprise, but also taking into account the influence of the external environment according to the following formula:

$$S_{ASE}^{comp} = S_{EAS} \times W_{EAS} + S_{IAS} \times W_{IAS}, \tag{8}$$



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where S_{EAS} , S_{IAS} - respectively integral indicators of the assessment of the systemic security of external and internal anti-crisis stability of the enterprise; W_{EAS} , W_{IAS} - respectively, weighting factors for assessing the systemic security of external and internal anti-crisis stability of the enterprise.

The gradation of the level of systemic provision of anti-crisis stability of the enterprise is proposed to be carried out according to Harrington's desirability scale [4]. The resulting indicator of a competitive position on the level of providing anti-crisis firmness (CP_i^{res}) is proposed to be calculated as an average geometric by the following formula:

$$CP_i^{res} = \sqrt{CP_i^{EAS} \times CP_i^{IAS}}, \quad (9)$$

where - respectively, the indicator of a competitive position in terms of providing external and internal anti-crisis stability of the i-th enterprise.

The resulting indicator of a competitive position on the level of ensuring the anti-crisis stability of the enterprise is a synthetic value and "surplus" of all parameters on the basis of their calculation, which allows comparative analysis in time and space, within which it can reflect the actual level of competitive position in terms of providing anti-crisis stability enterprises

Conclusions. The application of a systematic approach to assessing the company's anti-crisis stability is extremely important, since it enables us to take into account the existing capabilities of ensuring the external and internal anti-crisis stability of the enterprise in a competitive environment. The proposed indicators have a clear definition of the parameters of the object of evaluation, the simplicity of evaluation, the informativeness of the evaluation, the system of evaluation of each component of the crisis-proof stability, allow you to calculate at the same time intervals.

On the basis of the obtained results, it is possible to determine the range of valuation values and to type the enterprises according to the resultant indicator of the competitive position and the level of system security of the company's anti-crisis stability, which will determine the priority directions and develop appropriate management measures to improve each component of the anti-crisis sustainability.

References

1. Dzhhereliuk, I. O. (2016). Ekonomichna sutnist antykrizovoi stiihosti pidpriemstva ta faktory, shcho na nei vplyvaiut [Economic substance of the concept «anti-crisis sustainability of the enterprise» and factors that affect it]. *Visnyk Khmelnytskoho natsionalnoho universytetu, Ekonomichni nauky - Bulletin of the Khmelnytsky National University. Economic sciences*, 2 (236), 3, 89–94 [in Ukrainian].
2. Mezentseva, O. O. (2014). Napriamy pidvyshchennia konkurentospromozhnosti metalurhiinykh pidpriemstv [Areas of increase of competitiveness of the metallurgical enterprises]. *Candidate's thesis*. Kiev: National Technical University of Ukraine «Kyiv Polytechnic Institute» [in Ukrainian].
3. Zghurovskiy, M. Z. (2009). *Stalyi rozvytok rehioniv Ukrainy [Sustainable development of regions of Ukraine]*. Kyiv: National Technical University of Ukraine «Kyiv Polytechnic Institute». Retrieved from http://activity.wdc.org.ua/ukraine/lzd_ukr-2400dpi-10.pdf [in Ukrainian].
4. Harrington, E. C. (1965). The Desirability Function. *Industrial Quality Control*, 21, 10, 494–498 [in English].

Література

1. Джерелюк, Ю. О. Економічна сутність антикризової стійкості підприємства та фактори, що на неї впливають / Ю. О. Джерелюк // Вісник Хмельницького національного університету. Економічні науки. – 2016. – Том 2 (236). – № 3. – С. 89-94.
2. Мезенцева, О. О. Напрями підвищення конкурентоспроможності металургійних підприємств : дисс. ... кандидата економ. наук : 08.00.04 / Мезенцева Ольга Олександрівна. – Київ : НТУУ «КПІ», 2014. – 204 с.
3. Сталый розвиток регіонів України [Електронний ресурс] / науковий керівник М. З. Згуровський. – К. : НТУУ «КПІ», 2009. – 197 с. – Режим доступу: [http:// activity.wdc.org.ua/ukraine/lzd_ukr-2400dpi-10.pdf](http://activity.wdc.org.ua/ukraine/lzd_ukr-2400dpi-10.pdf).
4. Harrington, E. C. The Desirability Function / E. C. Harrington // *Industrial Quality Control*. – 1965. – V. 21. – № 10. – С. 494–498.

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