

JEL: D21, L19, M21

Liezina Anastasiia

Candidate of Science in Economics

Kyiv National Economic University named after Vadim Hetman

Ukraine

ORCID: 0000-0003-0516-6598

[https://doi.org/10.60022/sis.3.\(01\).4](https://doi.org/10.60022/sis.3.(01).4)

IMPLEMENTATION OF THE MECHANISM FOR STRENGTHENING ECONOMIC SECURITY INTO THE ENTERPRISE DEVELOPMENT STRATEGY

Abstract. Sustainable development of the enterprise through the implementation of a reliable strategy is a significant factor in competitiveness and increasing the level of profitability. Against this background, strengthening economic security is only a guarantee and support for this direction. At the same time, in the modern scientific world there are not enough methods and tools that allow for the successful implementation of the processes of strengthening the economic security of enterprises in its development strategy. In this direction, it is important to consider the initial conditions of the level of economic security of the enterprise and, accordingly, choose the direction of strategic development (aggressive, compromise or conservative) that would satisfy both the increase in the level of security and would help create conditions for long-term planning. The study used a system of methods and tools that allowed solving the tasks of the article: quantitative (statistical), qualitative (expert), abstraction, deduction, mathematical modelling and induction. The database used to confirm the effectiveness of the implementation of the processes of strengthening economic security in the enterprise development strategy is official statistical sources of financial activity of enterprises and expert assessment of employees.

It is proven that strengthening the economic security of enterprises plays an important role both in the effective functioning of the enterprise and in its further strategic development. Therefore, the implementation of the two components, with constant control of implementation, has a synergy effect. The methodology of priority placement (SMART), additive weighting (SAW), “ideal” points (LINMAP) and ideal positive solution (TOPSIS) is proposed to establish adaptive interaction of the processes of strengthening economic security and the development of strategic planning of enterprises.

The recommendations received on the proposed strategies for the development of enterprises of the Unified Economic System-U indicate an increased need for the formation of a new type of internal management, which fully reflects the long-term development plans of enterprises. The proposed methodology will be useful for both internal and external stakeholders of enterprises, and can also be implemented in various industries.

Keywords: economic security, development, strategy, model, SMART criteria, enterprise.



1. Introduction

The development strategy of any enterprise is the key to its continuous development, choosing the right path and, above all, making the right decisions in a timely manner and with the best use of all resources. Currently, a correctly chosen strategy is the vector of development, the formation of the enterprise and obtaining the desired level of competitiveness. Today, enterprises do not exist separately from the system, but themselves create a system of relationships in which they function. At the same time, having a desire to constantly develop and improve. The development of the theory of strategic management has its roots in the middle of the last century, but at present, digitalization and the widespread use of artificial intelligence dictate the conditions and contribute to the environment of all factors of the enterprise's management in order to obtain the desired result. In this direction, economic security, as a component that allows you to adjust the vector of movement in time, is a significant component. Accordingly, the improvement of the strategic management of the enterprise has its dependence on the correctly chosen mechanism for managing the economic security of the enterprise.

The purpose of this article is to determine the methodology for the successful implementation of the mechanism for strengthening the economic security of an enterprise in conditions of uncertainty in the enterprise's development strategy.

Not many scientific works are devoted to the issue of implementing a mechanism for strengthening the economic security of enterprises in the strategy of its development. And currently, it is inherent in scientists to characterize economic security at the state level and form a general picture of creating conditions for security guarantees in the economic context by isolating various components. Thus, according to Pryimak et al. [1], the system of socio-cultural indicators in the state is of great importance. Their formation can ensure the proper level of development of the population and the country as a whole. But the authors do not single out the formation of such a system at the enterprise level and, accordingly, do not cover the issue of the development of economic entities. The results obtained in the work of scientists are general and can serve to develop macroeconomic potential. In this direction, it is also worth noting the work of Popławski [2], who develops the specified issues and analyzes data on the implementation of a multifactor model of socio-cultural security, using the example of Poland. The author suggests that correctly identified threats and risks can help predict the standard of living of the territory being analyzed. The presented model covers a wide range of indicators for analysis, it contains clearly distinguished cause-and-effect relationships, but it is also aimed at the state and population levels. As for individual enterprises, this approach is not effective, due to the fact that it does not reflect all components of economic activity. This type of research will be more favorable for determining demographic characteristics of development.

In the direction of development and strategic thinking, scholars such as Saba [3] have good achievements, highlighting the economic prosperity of African countries. In the work, the author, as a result of the study, proves the relationship between economic prosperity and security, which confirms our opinion about the right trajectory for strategic planning. It is also worth noting Shigeaki [4], who describes in detail the example of Japan, where since 2022, tracking the level of economic security of the state has been adopted at the level of legislative regulation. That is, Japan accepts the fact of mandatory formation of the country's development on the basis of economic security. In this case, we again have confirmation of the macro-level manifestation of the introduction of economic security tracking, but the connection between strategy and this direction is already traced. Another Asian country also directs its achievements towards development through the prism of economic security. It is worth noting the opinion of Yuan [5], who proposes to train workers so that they can create security conditions for their country abroad at any time. And also, Koyu et al. [6] form the historical background and development regarding the countries of the East. As for the instrumental base of research, the field of application of the tools is quite wide. Mora et al. [7] apply the strategy of smart specialization (C3), the results of which testify to the effectiveness in the direction of implementing innovations. Walsh & Lannon [8] pay attention to the strategy of knowledge management, and in the development of this direction it is worth noting Andriushchenko et al. [9], who prove the methodological application using the example of analyzing the aviation sector of the economy.

Regarding the methodology of economic security, many scientists pay attention to defining the components of this concept. They analyze different approaches and methods of factors that make up the general system of indicators of economic security of enterprises. These include the studies of Zhao & Yue [10] and Wu et al. [11], which introduce analysis and comparison tools to determine added value, as a component of economic security, which can be traced through the instrumentation of uncertainty and fuzzy sets. The results are quite important, but are not unified for different industries, but focused on construction, which has its own specifics of functioning. On the other hand, there are studies that indicate the multifaceted nature of economic security factors. Thus, the works of Andriushchenko et al. [12] and Liezina et al. [13] expand the list of indicators and prove their relevance and reliability of calculations in various sectors of the economy. Scientists most often use point (Leal et al. [14]), indicator (Font et al. [15]), integral (Renthlei & George [16] and Chen et al., [17]) and expert methods (Qazi & Simsekler [18]). All of them are quite popular, but have drawbacks. These include the subjectivity of the results, given the involvement of experts who express their own opinions; unreliability of the data, because along with statistical data, there is also a point assessment, which neutralizes the general results; the formation of a general result, which does

not reveal the details of its creation, and accordingly does not provide opportunities for the necessary recommendations. Given this, it can be formed that during the strategic planning of the development of the enterprise, there are no factors and methods that are supported by the instrumental base of economic security.

In general, the implementation of the mechanism for strengthening the economic security of enterprises is carried out by all employees in the process of conducting entrepreneurial activity, which is most often the object of planning. It is obvious that achieving an appropriate level of own economic security by enterprises is the result not only of establishing the “rules of the game” for its provision and strengthening, but also of developing clear algorithms for their observance and integration into strategic and tactical plans. This opinion is supported by scientists Hu et al. [19] and Fayoumi & Loucopoulos [20] in their works.

With due respect to the scientific developments of the authors, we note a certain fragmentation in the consideration of the implementation of mechanisms for strengthening the economic security of enterprises in the strategy of its development. Within the framework of our research, it will be useful to use the means, methods and tools of the above-mentioned authors, which can be partially used for our scientific research.

2. Materials and Methods

Regarding the issues of our research, the NAO-MIE management process life cycle model attracts attention, the stages of which successfully reflect the logic of developing an enterprise’s economic security strategy. In the specified model (Table 1), it is possible to conditionally distinguish 3 zones of responsibility for its implementation by economic activity subjects. These are the NAE, MIO, MEA triangles.

In the process of strategy development, the planning boundaries are expanded and the goals (tasks, priorities, etc.) of the enterprise are clearly set within each of the components of economic security, taking into account its general level. Based on this, the strategy for strengthening the economic security of the enterprise should be a plan of coordinated actions that concerns all its components. For this, it is advisable to distinguish the following strategies: aggressive, compromise and conservative. In order to implement the process of strengthening the economic security of enterprises in the strategy of its development (in accordance with the selected type of strategy), the use of “intellectual” methods and criteria is provided. These are SMART criteria, which provide that any strategy, including the one we are studying, must be: specific, measurable, attainable, relevant, time-bound. Obviously, these criteria have different meanings for each of the components of economic security due to their objective features. To do this, it is necessary to take into account all the SMART criteria when choosing an enterprise’s economic security strategy, which requires the use of combined methods of their assessment, which harmoniously combine the entire toolkit. This group includes the following methods: priority ranking (SMART), additive weighting (SAW), “ideal” points (LINMAP), ideal positive solution (TOPSIS). It is worth noting that, despite the similarity of individual calculation algorithms, each of these methods differs in the implementation mechanism and approach to compiling a matrix for choosing an enterprise’s economic security strategy.

In the most general sense, the implementation of these methods comes down to modeling the impact of SMART criteria assessments on the choice of a particular economic security strategy using the following formulas that take into account the uncertainty factor:

Table 1

Essential characteristics of the NAOMIE model for application in enterprise strategy

An element of the model		Areas of responsibility and stages of implementation of model elements		Information needs when implementing model elements
<i>N</i> <i>(needs)</i>	The need and prerequisites for strategy development	MNEO: Strategy implementation entity		Information about existing and potential threats to the economic security of the enterprise
<i>A</i> <i>(aim)</i>	The goal of strategy development			Δ MIO: Heads of structural divisions
<i>O</i> <i>(objectives)</i>	Tasks and directions of strategy development	Information on the advantages and disadvantages of using different strategy development methods		
<i>M</i> <i>(methods)</i>	Strategy development methods and their alternatives	Information on the progress of implementation of measures provided for by the strategy		
<i>I</i> <i>(implementation)</i>	Strategy implementation			
<i>E</i> <i>(evaluation)</i>	Evaluation and control of strategy implementation	Δ MEA: Business owner		Information on the presence of deviations of actual indicators from planned ones

Source: author’s development

$$x_{ij} = \frac{a_{ij}}{\sqrt{\sum_{j=1}^m a_{kj}^2}}, \quad (1)$$

$$S_i = \sqrt{\sum_{j=1}^m w_j * (x_{ij} - x_j^+)^2}, \quad (2)$$

$$S_{j=1}^+ = \sqrt{\sum_{j=1}^m (x_{ij} - x_j^+)^2}, \quad (3)$$

$$S_{j=1}^- = \sqrt{\sum_{j=1}^m (x_{ij} - x_j^-)^2}, \quad (4)$$

$$S = \frac{S_j^-}{S_j^- + S_j^+}, \quad (5)$$

where x_{ij} — normalized values of SMART criteria scores;

a_{ij} — SMART criteria score;

S — integral score of SMART criteria;

w_j — SMART criterion weight;

x_j^+ — maximum value of SMART criteria score;

x_j^- — minimum value of SMART criteria score;

S_j^+ — distance to ideal positive solution;

S_j^- — distance to ideal negative solution.

Given the fact that the above formulas are universal and can be used to solve various problems related to the assessment of certain criteria, there is a need to adapt them to the scope of our study.

3. Results and Discussion

Thus, the method of prioritization, the calculation logic of which is presented in Table 2, involves obtaining expert assessments (often on a 100-point scale), adjusted for the weight of each SMART criterion. In other words, we are talking about the calculation and further analysis of the integral expert assessment obtained by normalizing the primary results. This method allows you to move from any expert assessment system to a unified matrix (normalized) through conversion to a 100-point scale.

Thus, the values obtained in the normalized matrix (Table 2) are adjusted to the weight of each of the SMART criteria and added to obtain an integral assessment of each strategy for strengthening economic security. The strategy, the integral assessment of which is greater than the others, is better for implementation. However, it is also necessary to take into account individual assessments of individual criteria that are a priority for a particular component of economic security. The method of assessing alternatives (SAW), unlike the previous one, involves the use of a different type of normalized matrix. The result of the criteria assessment is the construction of a normalized matrix with values in the range from 0 to 1 (Table 3), since each assessment is divided by the maximum of the selected set of values. For greater accuracy, the weight of the SMART criteria can be used.

A distinctive feature of this method is that the SMART criteria cannot be evaluated equally. This condition is additionally stipulated during expert assessment. This leads to the fact that one strategy is

Table 2

Calculating the assessment of SMART criteria using the method of determining priorities

Strategies	Criteria					Integral assessment
	S	M	A	R	T	
Aggressive	$S_1 * S_0$	$M_1 * M_0$	$A_1 * A_0$	$R_1 * R_0$	$T_1 * T_0$	$S_1 * S_0 + M_1 * M_0 + A_1 * A_0 + R_1 * R_0 + T_1 * T_0$
Compromising	$S_2 * S_0$	$M_2 * M_0$	$A_2 * A_0$	$R_2 * R_0$	$T_2 * T_0$	$S_2 * S_0 + M_2 * M_0 + A_2 * A_0 + R_2 * R_0 + T_2 * T_0$
Conservative	$S_3 * S_0$	$M_3 * M_0$	$A_3 * A_0$	$R_3 * R_0$	$T_3 * T_0$	$S_3 * S_0 + M_3 * M_0 + A_3 * A_0 + R_3 * R_0 + T_3 * T_0$
Criterion weight	S_0	M_0	A_0	R_0	T_0	$S_0 + M_0 + A_0 + R_0 + T_0$

Note: S_0, M_0, A_0, R_0, T_0 — the weight of SMART criteria in the integral assessment;
 $S_0 + M_0 + A_0 + R_0 + T_0 = 1$;
 $S_{01,2,3}, M_{1,2,3}, A_{1,2,3}, R_{1,2,3}, T_{1,2,3}$ — expert assessment of SMART criteria on a 100-point scale

Source: author's development

Table 3

Calculation of SMART criteria scores using the adaptive weighting (SAW) method

Strategies	Criteria					Integral assessment
	S	M	A	R	T	
Aggressive	$S_1/100$	$M_1/100$	$A_1/100$	$R_1/100$	$T_1/100$	$(S_1 * S_0 + M_1 * M_0 + A_1 * A_0 + R_1 * R_0 + T_1 * T_0)/100$
Compromising	$S_2/100$	$M_2/100$	$A_2/100$	$R_2/100$	$T_2/100$	$(S_2 * S_0 + M_2 * M_0 + A_2 * A_0 + R_2 * R_0 + T_2 * T_0)/100$
Conservative	$S_3/100$	$M_3/100$	$A_3/100$	$R_3/100$	$T_3/100$	$(S_3 * S_0 + M_3 * M_0 + A_3 * A_0 + R_3 * R_0 + T_3 * T_0)/100$
Criterion weight	S_0	M_0	A_0	R_0	T_0	$S_0 + M_0 + A_0 + R_0 + T_0$

Note: S_0, M_0, A_0, R_0, T_0 — the weight of SMART criteria in the integral assessment;
 $S_0 + M_0 + A_0 + R_0 + T_0 = 1$;
 $S_{01,2,3}, M_{1,2,3}, A_{1,2,3}, R_{1,2,3}, T_{1,2,3}$ — expert assessment of SMART criteria on a 100-point scale

Source: author's development

necessarily the best according to a certain criterion. Obviously, this method makes it possible to better identify the advantage of a particular criterion in different economic security strategies, which is especially important when combining them for its various components and taking into account uncertainty conditions. However, for a combination of economic security strategies of an enterprise, it is not enough to take into account the weight of the criteria assessment when compiling a normalized matrix. For this, according to the method of “ideal” points (LINMAP), it is necessary to adjust the initial criteria assessments using formula 4 (Table 4).

The next step is to select the “ideal” points, in the case of maximum values of the adjusted scores of the SMART criteria. Next, the distances to the “ideal” points for each criterion are determined based on formula 2 (Table 5). The strategy whose integral score is smaller than the others is the best for implementation.

However, in practice, it is often difficult to unambiguously evaluate a particular SMART criterion using the “ideal” point method by choosing only one of them. This is due to the fact that several values can be approximately the same and claim to be “ideal”. To

overcome this situation, it is advisable to implement the TOPSIS method, which will allow simultaneously taking into account the distance from the ideal positive and ideal negative value of the criteria assessment within each of them. This method is a logical continuation of the previous one, since on the basis of calculating the adjusted values of SMART criteria using the “ideal” point method, their normalization occurs depending on the weight of each of them (Table 6).

Having adjusted the values of the SMART criteria, their ideally positive (maximum) and ideally negative (minimum) evaluations are then determined with the simultaneous calculation of the distance from each other. This distance, calculated on the basis of formulas 3 and 4 (similar to the calculations given in table 5), is the basis for the final integral evaluation of the SMART criteria according to formula 5. The strategy, the integral evaluation of which is greater than the others, is better for implementation.

Confirmation of the feasibility of implementing adapted methods for assessing SMART criteria when choosing a strategy for strengthening economic security in conditions of uncertainty was facilitated by their testing at enterprises. The companies of the Unified

Table 4

Calculation of SMART criteria score using the “ideal” points method (LINMAP)

Strategies	Criteria				
	S	M	A	R	T
Aggressive	$\frac{S_1}{\sqrt{\sum S_i^2}}$	$\frac{M_1}{\sqrt{\sum M_i^2}}$	$\frac{A_1}{\sqrt{\sum A_i^2}}$	$\frac{R_1}{\sqrt{\sum R_i^2}}$	$\frac{T_1}{\sqrt{\sum T_i^2}}$
Compromising	$\frac{S_2}{\sqrt{\sum S_i^2}}$	$\frac{M_2}{\sqrt{\sum M_i^2}}$	$\frac{A_2}{\sqrt{\sum A_i^2}}$	$\frac{R_2}{\sqrt{\sum R_i^2}}$	$\frac{T_2}{\sqrt{\sum T_i^2}}$
Conservative	$\frac{S_3}{\sqrt{\sum S_i^2}}$	$\frac{M_3}{\sqrt{\sum M_i^2}}$	$\frac{A_3}{\sqrt{\sum A_i^2}}$	$\frac{R_3}{\sqrt{\sum R_i^2}}$	$\frac{T_3}{\sqrt{\sum T_i^2}}$

Note: $S_{1,2,3}$, $M_{1,2,3}$, $A_{1,2,3}$, $R_{1,2,3}$, $T_{1,2,3}$ — expert assessment of SMART criteria on a 100-point scale

Source: author's development

Table 5

Calculation of SMART criteria score using the “ideal” points method (LINMAP)

Strategies	Integral assessment
Aggressive	$\sqrt{S_0 * (S_1 - S_{\max})^2 + M_0 * (M_1 - M_{\max})^2 + A_0 * (A_1 - A_{\max})^2 + R_0 * (R_1 - R_{\max})^2 + T_0 * (T_1 - T_{\max})^2}$
Compromising	$\sqrt{S_0 * (S_2 - S_{\max})^2 + M_0 * (M_2 - M_{\max})^2 + A_0 * (A_2 - A_{\max})^2 + R_0 * (R_2 - R_{\max})^2 + T_0 * (T_2 - T_{\max})^2}$
Conservative	$\sqrt{S_0 * (S_3 - S_{\max})^2 + M_0 * (M_3 - M_{\max})^2 + A_0 * (A_3 - A_{\max})^2 + R_0 * (R_3 - R_{\max})^2 + T_0 * (T_3 - T_{\max})^2}$

Note: S_0 , M_0 , A_0 , R_0 , T_0 — the weight of SMART criteria in the integral assessment;

$S_0 + M_0 + A_0 + R_0 + T_0 = 1$;

$S_{1,2,3}$, $M_{1,2,3}$, $A_{1,2,3}$, $R_{1,2,3}$, $T_{1,2,3}$ — expert assessment of SMART criteria on a 100-point scale

$S_{\max}$, $M_{\max}$, $A_{\max}$, $R_{\max}$, $T_{\max}$ — the meaning of “ideal points”

Source: author's development

Table 6

Calculation of SMART criteria score using the “ideal” points method (LINMAP)

Strategies	Criteria				
	S	M	A	R	T
Aggressive	$\frac{S_1}{\sqrt{\sum S_i^2}} * S_0$	$\frac{M_1}{\sqrt{\sum M_i^2}} * M_0$	$\frac{A_1}{\sqrt{\sum A_i^2}} * A_0$	$\frac{R_1}{\sqrt{\sum R_i^2}} * R_0$	$\frac{T_1}{\sqrt{\sum T_i^2}} * T_0$
Compromising	$\frac{S_2}{\sqrt{\sum S_i^2}} * S_0$	$\frac{M_2}{\sqrt{\sum M_i^2}} * M_0$	$\frac{A_2}{\sqrt{\sum A_i^2}} * A_0$	$\frac{R_2}{\sqrt{\sum R_i^2}} * R_0$	$\frac{T_2}{\sqrt{\sum T_i^2}} * T_0$
Strategies	$\frac{S_3}{\sqrt{\sum S_i^2}} * S_0$	$\frac{M_3}{\sqrt{\sum M_i^2}} * M_0$	$\frac{A_3}{\sqrt{\sum A_i^2}} * A_0$	$\frac{R_3}{\sqrt{\sum R_i^2}} * R_0$	$\frac{T_3}{\sqrt{\sum T_i^2}} * T_0$

Note S_0, M_0, A_0, R_0, T_0 — the weight of SMART criteria in the integral assessment;
 $S_0 + M_0 + A_0 + R_0 + T_0 = 1$;
 $S_{1,2,3}, M_{1,2,3}, A_{1,2,3}, R_{1,2,3}, T_{1,2,3}$ — expert assessment of SMART criteria on a 100-point scale

Source: author's development

Energy System of Ukraine (UES-U) were selected for the analysis, namely JSC NNEGC Energoatom, NEC Ukrenenergo, JSC Ukrhydroenergo, JSC NJSC Naftogas Urkayny, PJSC DTEK Kyiv Regional Electric Networks, JSC DTEK Zakhidenergo, JSC DTEKDni-proenergo, PJSC Centrenergo. Thus, the corresponding results of calculations of SMART criteria when choosing a strategy are presented in Fig. 1.

The results of the calculations of SMART criteria when choosing a strategy for strengthening the economic security of enterprises of the Unified Energy System of Ukraine using the adaptive weighting (SAW) method are presented in Fig. 2.

The results of the calculations of SMART criteria when choosing a strategy for strengthening the economic security of enterprises of the Unified Energy

System-U using the method of “ideal” points (LINMAP) are presented in Fig. 3.

The results of the calculations of SMART criteria when choosing a strategy for strengthening the economic security of enterprises of the Unified Energy System (UES) using the method of ideal positive solutions (LINMAP) are presented in Fig. 4.

The results of the simulation and analysis show almost complete coincidence of the results of the assessment of SMART criteria using the methods of prioritization and additive weighting (SAW). The differences are associated with the revision of the assessments of SMART criteria during the implementation of the second method, since, according to it, their identical values are unacceptable. In addition, the results of the implementation of the specified methods allow

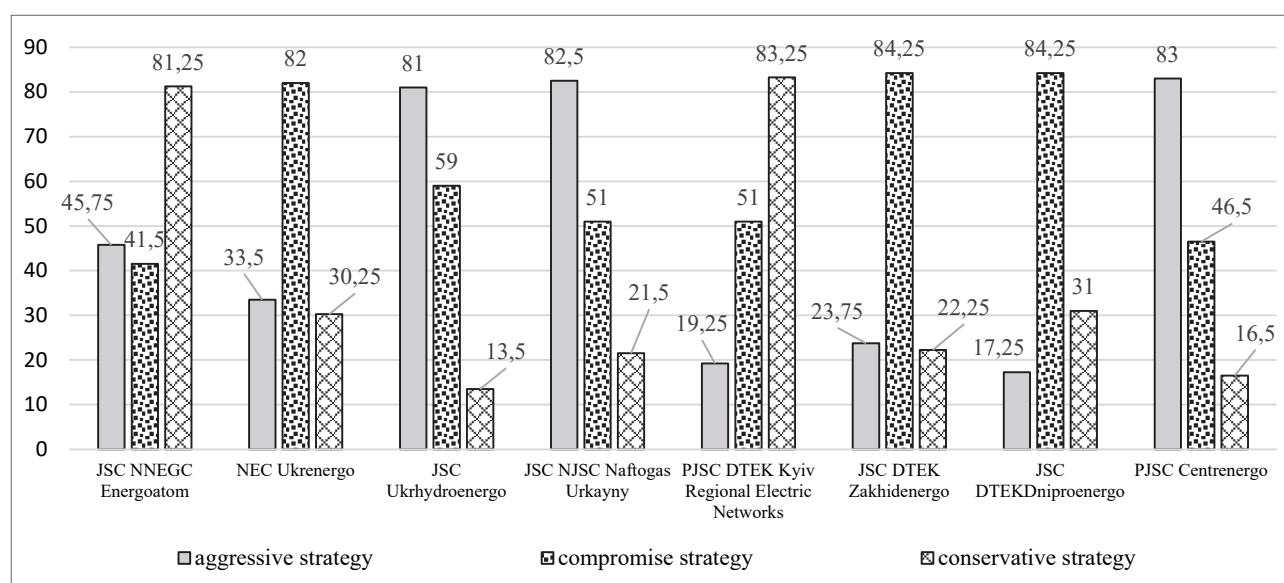


Figure 1. Results of the assessment of SMART criteria when choosing a strategy for strengthening the economic security of the UES-U enterprise

Source: calculated by the author

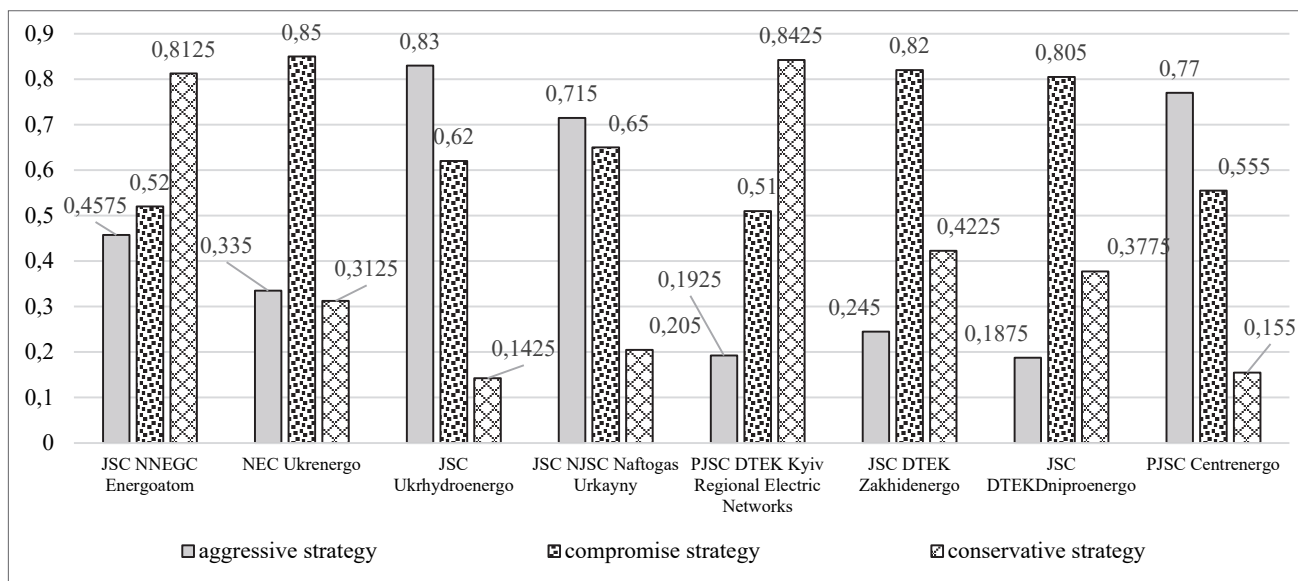


Figure 2. Results of the evaluation of SMART criteria when choosing a strategy for strengthening the economic security of enterprises of the UES-U enterprise using the adaptive weighting method (SAW)

Source: calculated by the author

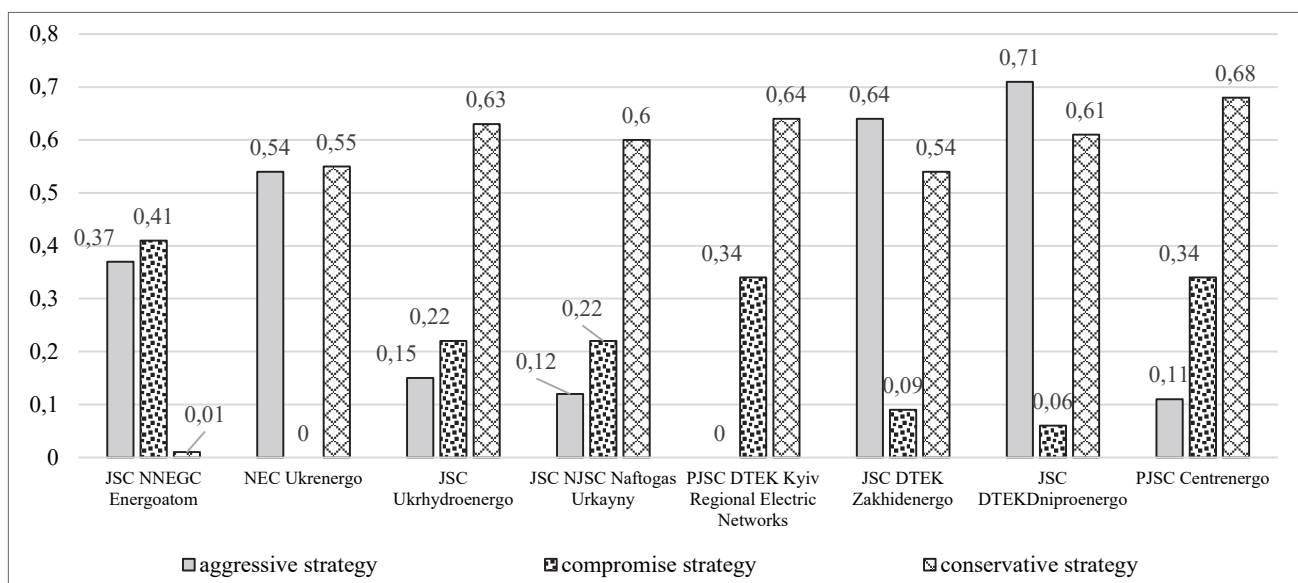


Figure 3. Results of the evaluation of SMART criteria when choosing a strategy for strengthening the economic security of enterprises of the UES-U enterprise using the method of “ideal” points (LINMAP)

Source: calculated by the author

us to conclude that the results are excessively “rigid”. This leads to the fact that it is only possible to accurately determine the choice between an aggressive and conservative strategy for strengthening economic security, which corresponds to a low or high level of it at enterprises, respectively. Thus, according to Fig. 1 and Fig. 2, the connection between the low level of economic security and the relevance of implementing an aggressive strategy for ensuring it is clearly visible. In some cases (JSC Ukrhydroenergo, JSC NJSC Naftogas of Ukraine) it was found that there is a need to apply a compromise strategy for strengthening economic security, especially for the criteria attainable (achievable) and time-bound (limited by time frames).

Developing the previously expressed opinion about the relationship between individual SMART criteria and some components of economic security, we can conclude that in this case we are talking about the need to apply a compromise strategy for the financial and intellectual and personnel components.

Thus, enterprises with a low level of economic security support the logic of implementing aggressive and compromise strategies for its provision and choosing it among others, linking the dominants of its implementation with attracting additional funds and reviewing the resources already available to the enterprise (especially material, not labor), and systematic verification of employees.

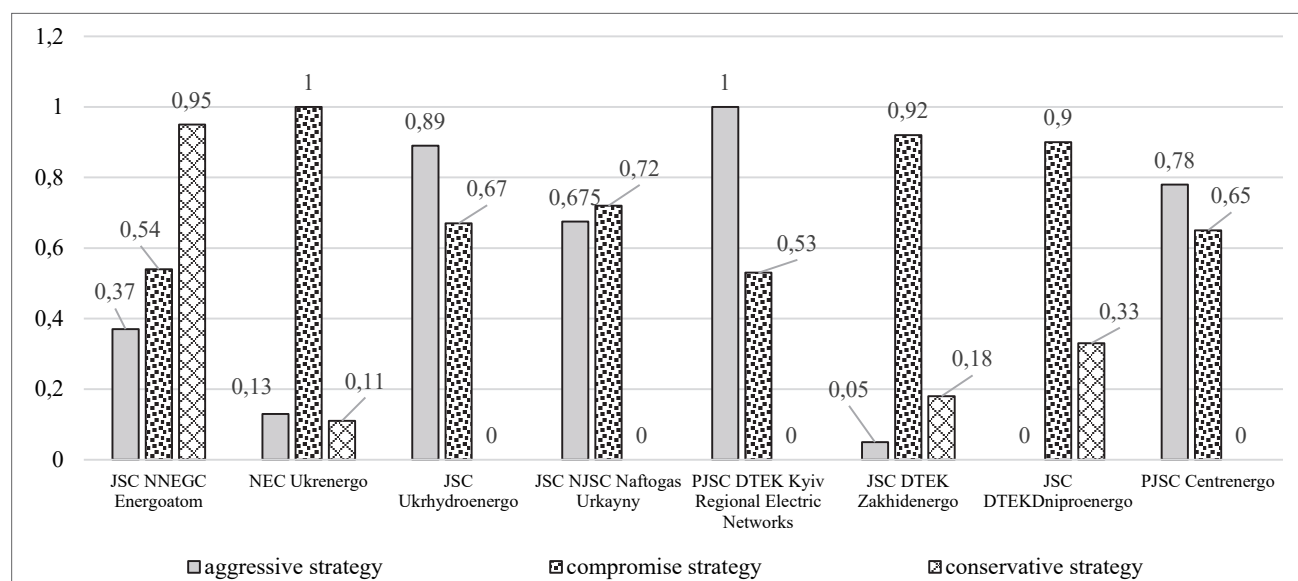


Figure 4. Results of the evaluation of SMART criteria when choosing a strategy for strengthening the economic security of enterprises of the UES-U enterprise using the method of ideal positive decision (LINMAP)

Source: calculated by the author

A similar situation is observed in expert assessments of SMART criteria at enterprises with a high level of economic security, which in the absolute majority corresponds to an exclusively conservative strategy for its provision. However, assessments of individual SMART criteria, for example, JSC NNEGC Energoatom and PJSC Centrenergo, indicate the relevance of implementing a compromise strategy for strengthening economic security.

Implementation of the methods of prioritization and additive weighting (SAW) does not allow establishing the need to apply a compromise strategy for strengthening economic security associated with optimizing or adapting its level. That is why for a more detailed selection of strategies it is advisable to use the method of “ideal” points (LINMAP), which was demonstrated practically (Fig. 3).

It is worth paying special attention to the fact that for some enterprises the value of the integral assessment of the SMART criteria is 0 (for example, in Fig. 3, a compromise strategy for NEC Ukrenergo or in Fig. 4, a conservative strategy for JSC Ukrhydroenergo), which is associated with the lack of alternatives in choosing a strategy for strengthening economic security. The absence of a special alternative in strategies is primarily characteristic of enterprises with an extremely low or rather high level of economic security. In turn, for enterprises whose level of economic security was assessed as average, the value of the integral assessment and its proximity to an aggressive or conservative strategy are of particular importance. Thus, in the first case, we are talking about a compromise optimization strategy, and in the second, adaptation of the level of economic security of the enterprise. Thus, taking into account the above, the implementation of a compromise optimization strategy is of particular relevance for NEC Ukrenergo. At the same time,

according to the obtained assessments of the SMART criteria and their comparison with the components of economic security, special attention should be paid to motivating employees to increase the level of economic security of the enterprise, as well as monitoring the implementation of management decisions (especially regarding operational activities: production of products, sale of goods, provision of services).

In turn, for JSC DTEK Zakhidenergo, JSC DTEK Dniproenergo, it is recommended to use a compromise strategy for adapting the level of economic security. This is due to the fact that the level of economic security of the specified enterprises is assessed as higher than average, however, its individual components require serious “strengthening”. For this, special attention should be paid to: improving automated management systems, their individual elements in order to protect access to information or restrict it; organizing interaction with financial institutions to attract additional funds.

It is impossible not to notice that the results obtained during the implementation of the ideal positive solution method (TOPSIS) and presented in Fig. 4, confirm the above in terms of choosing a compromise strategy for optimizing or adapting the level of economic security. However, it is worth noting that the value of the integral assessment of some strategies (conservative in JSC Ukrhydroenergo, JSC NJSC Naftogaz of Ukraine, PJSC DTEK Kyiv Regional Electric Grids, PJSC Centrenergo) is equal to 0. This state of affairs indicates that their application does not fully correspond to the existing level of economic security, which clearly demonstrated this.

In turn, the value of the integral assessment of strategies for ensuring economic security, equal to 1, indicates a special lack of alternatives for their choice (according to the results presented in Fig. 4, we are

talking about an aggressive or conservative strategy). In other words, it is the application of the ideal positive solution method (TOPSIS) that allows us to maximally substantiate the choice of strategies for strengthening economic security or their combination for its various components. This is done by taking into account the mutual influence of both the maximum and minimum assessments by experts of the SMART criteria and determining their integral value, which clearly demonstrates the quantitative difference between them. The difference between such values, according to the results in Fig. 4, can be significant, which simplifies the choice of a particular strategy for strengthening economic security. Based on the above, it is quite logical that, according to the results of implementing all methods for assessing SMART criteria, for enterprises with a high level of economic security, a conservative strategy for ensuring it is preferable. Thus, the main attention should be paid to: regular explanatory work with employees in order to prevent deviations from work regimes; systematic coordination of goals and objectives of activities with real financial capabilities and key indicators of financial stability (especially in conditions of reduced solvency of individuals and legal entities).

However, taking into account the SMART criteria when implementing a particular strategy for strengthening economic security without its detailed plan minimizes the value of efforts to select it using the methods considered earlier. According to the NAOMIE model (Table 1), the choice of a strategy should be supported by the development of a plan of measures for their implementation in the context of not only each component of economic security, but also the planned results within each of them. To understand and further take into account the fact that the results of the implementation of measures envisaged by the selected strategy for strengthening economic security can be extremely different, it is advisable to differentiate them through the prism of at least three levels: initial, sufficient, advanced.

Accordingly, an important aspect for further resolution remains the issue of determining the level of decision-making for the selected strategies, that is, including an action plan aimed at solving at the tactical (initial level) and strategic (sufficient and advanced levels) levels. However, if the solution of tactical tasks within the framework of the strategy is mainly associated with the economic effect (quantitative efficiency criteria), then the implementation of strategic ones is also associated with the social (qualitative efficiency criteria).

Such differentiation of the levels of implementation of the strategy for strengthening the economic security

of the enterprise not only stimulates the solution of the maximum number of tactical and strategic tasks, but also orients to a more detailed elaboration of the relevant measures in the conditions of uncertainty of the future.

It should be understood that the number of planned and implemented measures is a conditional criterion for determining the levels of implementation of the strategy. However, when developing a detailed plan of measures for the implementation of the strategy for the collision of the economic security of the enterprise, for each of its components there will be different criteria for attributing the “general” result to the initial, sufficient or advanced level. For example, a 5% reduction in staff turnover can be considered the initial level of strategy implementation for the intellectual and human resources component, 10% — sufficient, 15% — advanced. In turn, the totality of the results achieved within each component of economic security indicates the real level of implementation of the strategy for its strengthening.

4. Conclusions

Thus, we have determined that the processes of strengthening the economic security of enterprises are easily introduced and implemented in the operational activities of enterprises under the condition of choosing an appropriate strategy of action. In addition, using SMART methods, it was determined that in accordance with the initial determined level of economic security, an important aspect is the choice of the desired strategy: aggressive, compromise or conservative. That is, the more exaggerated the economic security of the enterprise, the less aggressive the methods of its further development should be. And based on the proposed methodological approach to the SMART assessment criteria, additive weighting (SAW), “ideal” points (LINMAP) and ideal positive solution (TOPSIS), it was established that most of them are adaptive and create a basis for a new direction of development for each of the studied enterprises of the Unified Economic System. As a result, it was recommended to choose the following strategies for further development and strengthening of economic security: aggressive for JSC Ukrhydroenergo, PJSC DTEK Kyiv Regional Electric Networks, PJSC Centrenergo; compromise — NEK Ukrenergo, JSC NJSC Naftogaz of Ukraine, JSC DTEK Zakhiden-ergo and JSC DTEK Dniproenergo; conservative — JSC NNEGC Energoatom. In conclusion, it is worth noting that the processes of strengthening the economic security of enterprises are easily integrated into the general concept using the proposed methods.

5. References

- [1] Pryimak, V., Ledzianowski, J., & Hrytsaiko, A. (2020). Socio-cultural component of Ukrainian economic security. *Journal of Decision Systems*, 29(sup1), 473–481. <https://doi.org/10.1080/12460125.2020.1848372>
- [2] Popławski, M. (2020). Assessment of socio-economic policy in the field of socio-economic security based on an analysis of the state of security of lower Silesia. *Journal of Decision Systems*, 29(sup1), 450–459. <https://doi.org/10.1080/12460125.2020.1847544>

- [3] Saba, C.S. (2020). Security as an outcome for promoting economic prosperity in the regional economic communities of Africa: Evidence from a panel data analysis. *African Security Review*, 29(4), 376–400. <https://doi.org/10.1080/10246029.2020.1835681>
- [4] Shigeaki, S. (2022). The Essential Challenge of “Economic Security.” *Asia-Pacific Review*, 29(3), 78–91. <https://doi.org/10.1080/13439006.2022.2154508>
- [5] Yuan, J. (2021). China’s private security companies and the protection of Chinese economic interests abroad. *Small Wars & Insurgencies*, 33(1–2), 173–195. <https://doi.org/10.1080/09592318.2021.1940646>
- [6] Koyu, I., Takahiro, C., Takuto, H., Takayuki, K., Yuta, M., Hiroaki, N., ... Taku, Z. (2022). Japan’s Economic Security Promotion Act: Background and Overview. *Asia-Pacific Review*, 29(3), 28–55. <https://doi.org/10.1080/13439006.2022.2154520>
- [7] Mora, L., Panori, A., Deakin, M., & Ortega-Argiles, R. (2022). Digital meets smart: towards a technology-enhanced approach to Smart Specialisation Strategy development. *Regional Studies*, 56(9), 1421–1428. <https://doi.org/10.1080/00343404.2022.2091775>
- [8] Walsh, J.N., & Lannon, J. (2020). Dynamic knowledge management strategy development in international non-governmental organisations. *Knowledge Management Research & Practice*, 21(2), 229–240. <https://doi.org/10.1080/14778238.2020.1785348>
- [9] Andriushchenko, K., Gurina, G., Danilova, E., Zaliziuk, V., Platonov, O. & Tkachuk V. (2021). Formation of an integrated structural assessment of the export potential of the aviation complex. *ACTA INNOVATIONS*, 39, 41–53. <https://doi.org/10.62441/actainnovations.v39i.261>
- [10] Zhao, X., & Yue, S. (2020). Analysing and forecasting the security in supply-demand management of Chinese forestry enterprises by linear weighted method and artificial neural network. *Enterprise Information Systems*, 15(9), 1280–1297. <https://doi.org/10.1080/17517575.2020.1739343>
- [11] Wu, Y., Zeng, H., Hao, N., & Ma, S. (2025). The impact of economic policy uncertainty on the domestic value added rate of construction enterprise exports — evidence from China. *Journal of Asian Architecture and Building Engineering*, 1–15. <https://doi.org/10.1080/13467581.2025.2479512>
- [12] Andriushchenko, K., Liezina, A., Slavkova, A., Logvinov, P., Lavruk, V., Petrukha, S. & Storozhenko, A. (2024). The Impact of Energy-Efficient Technologies on the Development of the Agricultural Industry. *Journal of Environmental & Earth Sciences*. 7(1): 423–437. DOI: <https://doi.org/10.30564/jees.v7i1.7635>
- [13] Liezina, A., Lavruk, A., Matvienko, H., Ivanets, I., Tseluiko, O. & Kuchai, O. (2023). Impact of econometric modeling and perspectives of economic security of the cross-industry complex. *ACTA INNOVATIONS*, 47, 73–83. <https://doi.org/10.62441/actainnovations.v47i.315>
- [14] Leal, G.S.S., Guédria, W., & Panetto, H. (2020). Enterprise interoperability assessment: a requirements engineering approach. *International Journal of Computer Integrated Manufacturing*, 33(3), 265–286. <https://doi.org/10.1080/0951192X.2020.1736636>
- [15] Font, X., Torres-Delgado, A., Crabolu, G., Palomo Martinez, J., Kantenbacher, J., & Miller, G. (2021). The impact of sustainable tourism indicators on destination competitiveness: the European Tourism Indicator System. *Journal of Sustainable Tourism*, 31(7), 1608–1630. <https://doi.org/10.1080/09669582.2021.1910281>
- [16] Renthlei, E., & George, A. (2024). Toward holistic neighbourhood sustainability assessment: integrating fuzzy Delphi method for sustainable indicator selection for Aizawl city. *Local Environment*, 1–20. <https://doi.org/10.1080/13549839.2024.2413080>
- [17] Chen, M., Liu, Q., Huang, S., & Dang, C. (2020). Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy. *Enterprise Information Systems*, 16(8–9). <https://doi.org/10.1080/17517575.2020.1856422>
- [18] Qazi, A., & Simsekler, M.C.E. (2021). Quality assessment of enterprise risk management programs. *Journal of Risk Research*, 25(1), 92–112. <https://doi.org/10.1080/13669877.2021.1913633>
- [19] Hu, W., Shi, Q., & Chen, J. (2023). Financing Constraints, Other People’s Money Strategy, and Enterprise Innovation. *Asia-Pacific Journal of Accounting & Economics*, 32(1), 91–109. <https://doi.org/10.1080/16081625.2023.2222135>
- [20] Fayoumi, A., & Loucopoulos, P. (2021). Bridging the Strategy Execution Gap of Designing Intelligent Talent Acquisition Systems Using Enterprise Modelling and Simulation. *Enterprise Information Systems*, 17(6). <https://doi.org/10.1080/17517575.2021.2005149>

Received: 11/11/2024

Accepted: 22/02/2025

Published: 29/03/2025

Лезіна Анастасія

кандидат економічних наук

Київський національний економічний університет ім. Вадима Гетьмана

Україна

ORCID: 0000-0003-0516-6598

[https://doi.org/10.60022/sis.3.\(01\).4](https://doi.org/10.60022/sis.3.(01).4)

ІМПЛЕМЕНТАЦІЯ МЕХАНІЗМУ ЗМІЦНЕННЯ ЕКОНОМІЧНОЇ БЕЗПЕКИ В СТРАТЕГІЮ РОЗВИТКУ ПІДПРИЄМСТВА

Анотація. Сталий розвиток підприємства за рахунок реалізації надійного стратегії є вагомим фактором конкурентоспроможності та підвищення рівня дохідності. На тлі цього зміцнення економічної безпеки є лише запорукою та підтримкою даного спрямування. Водночас у сучасному науковому світі недостатньо методів та інструментів, що дозволяють провести вдалу імплементацію процесів зміцнення економічної безпеки підприємств в його стратегію розвитку. У такому спрямуванні важливо розглядати первісні умови рівня економічної безпеки підприємства та відповідно обирати той напрям стратегічного розвитку (агресивний, компромісний чи консервативний), який задовільнив би і підвищення рівня безпеки і допоміг би створити умови для довгострокового планування. У дослідженні використано систему методів та засобів, які дозволили вирішити задачі статті: кількісного (статистичного), якісного (експертного), абстракції, дедукція, математичного моделювання та індукція. Базою даних, що використовується для підтвердження дієвості імплементації процесів зміцнення економічної безпеки в стратегію розвитку підприємства, є офіційні статистичні джерела фінансової діяльності підприємств та експертна оцінка працівників.

Доведено, що зміцнення економічної безпеки підприємств відіграє важливу роль як в ефективному функціонуванні підприємства, так і в його подальшому стратегічному розвитку. Отже, імплементація двох складових, при постійному контролі реалізації, має ефект синергії. Запропоновано методологію розташування пріоритетів (SMART), адитивного зважування (SAW), «ідеальних» точок (LINMAP) та ідеального позитивного рішення (TOPSIS) для налагодження адаптивної взаємодії процесів зміцнення економічної безпеки та розвитку стратегічного планування підприємств.

Отримані рекомендації щодо запропонованих стратегій розвитку підприємств ОЕС-У свідчать про посилення потреби у формуванні нового типу внутрішнього управління, який повністю відображає довгострокові плани розвитку підприємств. Запропонована методологія буде корисною як для внутрішніх, так і для зовнішніх стейкхолдерів підприємств, а також може бути реалізована в різних галузях діяльності.

Ключові слова: економічна безпека, розвиток, стратегія, модель, SMART критерії, підприємство.