JOURNAL OF SECURITY AND SUSTAINABILITY ISSUES
ISSN 2029-7017 print/ISSN 2029-7025 online
2020 June Volume 9 Number 4
http://doi.org/10.9770/jssi.2020.9.4(25)

Scopus®

SYNERGETIC MANAGEMENT TOOLS FOR ENTERPRISE ECONOMIC SECURITY

Lidiia Karpenko[1]*, Oksana Zhylinska[2], Hennadii Dmytrenko[3], Nataliia V. Poprozman[4], Viktoriia Koltun[5]

[1] Odessa Regional Institute for Public Administration of the National Academy for Public Administration under the President of Ukraine, Genuezka, 22, 65009, Odessa, Ukraine*
[2]Taras Shevchenko National University of Kyiv, Volodimirska st., 60, Kiev, 01033 Ukraine
[3] Institute for Personnel Training of the State Employment Service of Ukraine,52-A, Sichovykh Striltsiv Street, Kyiv, 01000, Ukraine
[4]National University of Life and Environmental Sciences of Ukraine, 15, Geroiv Oboroni st., Kiev, 03041, Ukraine
[5]National Academy for Public Administration under the President of Ukraine, 20, Ezhena Pottier st., Kyiv, 03057, Ukraine

E-mail: [1]koaduep@gmail.com (Corresponding author)*

Received 15 October 2019; accepted 25 March 2020; published 30 June 2020

Abstract. The study of synergistic laws and patterns made it possible to substantiate and explain the possibility of their transfer to the plane of the theory of management of economic security of the enterprise in order to develop tools for synergistic management of economic security of the enterprise. The definition of the concept of "economic security of the enterprise" is proposed, which represents the ability to resist it as an ectropic factor to the influence of threats to the environment, ie the supersystems (countries and industries) as an entropy factor, as well as ability to respond to threats in a coordinated way. An algorithm for substantiating the choice of strategies for managing the economic security of the enterprise has been developed; using this algorithm based on the detection of bifurcation points and their analysis, it is possible to identify the type of crisis and take into account the existence of the internal mechanism of development inherent in the economic security of the enterprise in a certain period - adaptation or bifurcation, according to which it is necessary to develop The paper emphasizes that a high level of economic security of the enterprise depends on the formation of synergistic effects, as well as on the ability to establish coherent or coordinated relationships that will lead to cooperative processes. Three types of synergetic effects resulting from management actions are considered: functional (this is a result equivalent to the sum of the component parts), positive (this is a result that exceeds the sum of the component parts) and negative (this is a result that is less than the sum of the component parts).

Keywords: economic security; synergistic effect; strategy; adaptation mechanism; bifurcation mechanism

Reference to this paper should be made as follows: Karpenko, L., Zhylinska, O., Dmytrenko, H., Poprozman, N.V., Koltun, V. 2020. Synergetic management tools for enterprise economic security. *Journal of Security and Sustainability Issues*, 9(4), 1421-1430. http://doi.org/10.9770/jssi.2020.9.4(25)

JEL Classifications: F35; F42

1. Introduction

The problem of security is widespread in the age of geostrategic reality, its cause is the exponential growth of threats to mankind and their multiplicity. This forces the security phenomenon to be viewed at all levels: at the level of the country, industry, enterprise, personality. Especially relevant today is the construction of the security paradigm of the enterprise itself, since the security of economic entities is a primary element in the security system of the national economy and is its important subsystem. In turn, meeting the needs of the highest level is impossible unless the need for security is satisfied. Therefore, managing the economic security of the enterprise becomes an important prerequisite for its development and achieving a state of stable equilibrium.

Scientific advances in security-oriented management are quite significant. At the same time, exacerbation of resource problems and acceleration of random fluctuations in the economy provoke an increase of chaos and uncertainty, emergence of unmanaged bifurcations, in which there is a probable choice between opposite trajectories of enterprise development - either a jumping efficiency increase or bankruptcy.

Therefore, solving the problem of managing the economic security of the enterprise requires taking into account the objective laws of synergetics, which will become its newest methodological platform. If you translate the concept of economic security into a synergetic thesaurus, it can be noted that it is a result of management actions that regulate the chaos in the enterprise, and security activities are an important element of the company's key homeostats. Thus, the success of the enterprise and its sustainability determine the relevance of the development of tools for synergistic management of economic security of the enterprise.

The purpose of the paper is to develop theoretical and methodological and applied foundations of synergistic management of economic security of the enterprise.

2. Literature Survey

Leading Ukrainian scholars such as: Lusardi, A., & Mitchell, O.S. (2017), Simanavičienė, Ž., & Stankevičius, A. (2017), Tvaronavičienė, M., Masood, O., & Javaria, K. (2018). have developed a powerful methodological foundation for further study of economic security issues. The severity of the issues outlined determines the increased interest of authoritative scientists in the study of synergetics as a theory of self-organization. The followin scientists have made a significant contribution to its research: Augutis, J., et al. (2017), Drobyazko, S., et al. (2019a), Drobyazko, S., et al. (2019b), Tetiana, H., et al. (2019); Plėta, et al. (2020)**.** The issues of the synergetic management of complex systems is addressed by: Ianioglo, A. (2018), Zhou, J., et al. (2018), Hilorme, T., et al. (2019). The exponential growth of threats to humanity and their multiple vectors forces to reconsider the security-science paradigm at all levels: at the state, enterprise, and individual levels (Dudin, M.N., et al. (2018); Chehabeddine, Tvaronavičienė, (2020)).

Understanding security as a law, principle and phenomenon (category) are closely linked:

– security as law is equated with being itself, that is, security is an inherent property of being at rest status (Peppers, S.F. (2017)). Being, in turn, is a prerequisite for safety;

– security as a principle is a process of protecting being, which obeys the immutable and powerful law of development and is its pledge (Yu, C. (2018)). Security leads to the transition from one being to another, and it is assumed that the next state of being will be better than the previous in terms of quantitative or qualitative characteristics, because security is modified with the development of the object or phenomenon;

– security as a phenomenon is opposed to constant being and it is in a dialectical relation to danger, because it is conditioned by the nature of self-preservation (Schimmel, K., et al. (2017)).

The popularity of security issues and their interdisciplinary nature, the volume of available research on security issues have led to the recognition of security studies as an epistemological branch of knowledge (Sohn, Y. (2019)). However, it cannot be said that security studies have acquired an inherent theoretical purity.It can be noted that the economic security of the enterprise is meaningless outside the world (Raji, SA, & Ogunrinu, A. (2018)). It exists by virtue of conventionality and may be a full-fledged methodological concept of such science as security science (Schatz, D., & Bashroush, R. (2017)).

Especially relevant today is the construction of the security paradigm of the enterprise itself, since the security of economic entities is a primary element in the economic security system of the national economy and is its important subsystem (Nan, S., & Wang, Y. (2018)).

With a deep respect for previous scientific achievements that are of great heuristic value, it should be noted that they are not fully completed, which necessitates the formation of the interdisciplinary synergistic paradigm for managing the economic security of the enterprise. It should envisage rethinking of established ideas and to be built on knowledge of the nature of security and the laws of the enterprise, which will allow developing a methodology

for synergistic management of the economic security of the enterprise, which will meet modern realities.

3. Methods

The theoretical and methodological basis of the work is a set of general philosophical and special methods, principles and techniques, as well as basic methodological approaches (systemic, process and situational).The following general scientific methods of theoretical and empirical research are used in the paper: systematic approach; analysis and synthesis; methods of theoretical generalization; methods of induction and deduction; semantic-structural analysis - to clarify the conceptual-categorical apparatus of security studies; philosophical and historical analysis - to study the economic security of the enterprise within the framework of scientific pictures of the world and through the prism of historical forms of outlook; problem-chronological analysis - to develop a chronological incorporation of the main legislative acts in the sphere of ensuring the economic security of the enterprise; comparative analysis - to evaluate the effectiveness of existing national security systems; monographic analysis - to study safety as a general scientific and economic category; economic fluctuations; graphoanalytical method - for visualization of basic principles and schematic representation of a number of theoretical and practical provisions.

4. Results

Synergetics explores the self-preservation of systems as a result of evolution, both through self-organization (the process of transition from chaos to order) and through self-disorganization (process of transition from order to chaos), and also takes into account the non-linear-bifurcation nature of development. Security is the need of the system in terms of internal and external destructive effects. If you translate the concept of economic security into a synergistic thesaurus, it can be noted that security activities are an important element of key homeostats of the enterprise, which allows to identify threats in advance and calculate them.Synergetics mathematical apparatus is based on nonlinear dynamics, which is a multidisciplinary science that studies the properties of nonlinear dynamic systems. It uses nonlinear models to describe them, which are usually described by differential equations and discrete mappings.

It is determined that one of the tools is an algorithm for justifying the choice of strategies for managing the economic security of the enterprise, depending on the internal mechanisms of its development. Thus, the processes of alternation of chaos and order are permanent, and the development of the system occurs from one point of bifurcation to another, performing the regulatory signaling function in recognition, which the mechanism is inherent in the system at a certain stage of development time - adaptation or bifurcation. Developing appropriate strategies becomes a decisive factor in the effective management of the enterprise's economic security.

It is proposed to introduce a new concept of "economic security of the enterprise", which reflects its resilience as an ectropic factor (FC) to the influence of environmental threats, namely, supersystems (countries and industries) as an entropy factor (FN), as well as ability to respond in a coordinated way.

The more the organization is influenced by the external environment, or the greater dependence of the organization on the external environment, the less stable the organization, and the more it influences the external environment, the more resilient it is.

In our opinion, only the assessment of the level of economic security of the enterprise is insufficient, also valuable is a cut-off (one-time) analysis of the interaction of entropy and ectropic factors, which allows determining the degree and status of resistance, which can be calculated by the formula:

$$R_{ES} = \frac{FN}{EC} \qquad (1)$$

where R_{ES} - resistance to economic security of the enterprise;

FN - entropy factor or level of economic security of the enterprise (country and industry) subsystem;

FC is the ectropic factor or level of economic security of the enterprise.

The entropy factor is the external environment, which brings chaos and uncertainty in the form of energy and resources flow, thereby disturbing the state of stable equilibrium of the internal environment of the enterprise until the cardinal restructuring.

The ectropic factor is the state of economic security of the enterprise, which determines the chances of the enterprise for long-term survival under the changing conditions of the environment.

The characteristics of a firm's economic security resistance are shown in Table 1, which outlines such classification features as the degree and status of resistance. From the point of view of synergetics, it was found that the first two zones correspond to a stable equilibrium state, the third one corresponds to a neutral stable equilibrium state, and the last two zones corresponds to an unstable equilibrium state, indicating a bifurcation point.

Table 1. Characteristics of resistance of economic security of the enterprise

R_{ES}	$\frac{FN}{FC} << 1$	$\frac{FN}{FC} < 1$	$\frac{FN}{FC} \sim 1$	$\frac{FN}{FC} > 1$	$\frac{FN}{FC} >> 1$
Degree of resistance	Balance	Weak imbalance	Average imbalance	Strong imbalance	Critical imbalance
Status of resistance	Steady state	Steady state	Neutral state	Unstable state (bifurcation point)	Unstable state (bifurcation point)

Source: Designed by the authors

If the level of economic security of the enterprise is higher than the level of economic security of the supersystem, then it indicates the ability of the enterprise to resist destructive influences and the ability to protect against threats of the supersystem, as well as its reliability, stability, integrity. If the level of economic security of the enterprise is lower than the level of economic security of the subsystem, then this indicates that the enterprise lacks the resources and competencies to overcome the environmental resistance, which can cause destruction / bankruptcy, and requires the introduction of a bifurcation mechanism.

It has been researched that the level of economic security of the enterprise and the level of economic security of the enterprise's supersystem are inseparable functions until the moment of transition of the enterprise to the crisis phase. Thus, the combinatorics of determining the economic security of the enterprise are presented as a two-dimensional matrix (Table 2).

Table 2. Combinatorics of determination of resistance of economic security of the enterprise

Level of economic security of the enterprise supersystem (FN)	Level of economic security of the enterprise (ES)				
	0-0,170 (limit value 0,170 is used for calculation)	0,171-0,320 (limit value 0,320 is used for calculation)	0,321-0,490 (limit value 0,490 is used for calculation)	0,491-0,710 (limit value 0,710 is used for calculation)	0,711-1,0 (limit value 1,0 is used for calculation)
0-0,170 (limit value 0,170 is used for calculation)	FN/FC ~ 1 *average imbalance*	FN/FC <1 *weak imbalance*	FN/FC <1 *weak imbalance*	FN/FC <<1 *balance*	FN/FC <<1 *balance*
0,171-0,320 (limit value 0,320 is used for calculation)	FN/FC>1 *critical imbalance*	FN/FC ~ 1 *average imbalance*	FN/FC <1 *weak imbalance*	FN/FC <1 *weak imbalance*	FN/FC <<1 *balance*
0,321-0,490 (limit value 0,490 is used for calculation)	FN/F>1 *strong imbalance*	FN/FC>1 *strong imbalance*	FN/FC ~ 1 *average imbalance*	FN/FC <1 *weak imbalance*	FN/FC <1 *weak imbalance*
0,491-0,710 (limit value 0,710 is used for calculation)	FN/FC>>1 *critical imbalance*	FN/FC>1 *strong imbalance*	FN/FC>1 *strong imbalance*	FN/FC ~ 1 *average imbalance*	FN/FC <1 *weak imbalance*
0,711-1,0 (limit value 1,0 is used for calculation)	FN/FC>>1 *critical imbalance*	FN/FC>>1 *critical imbalance*	FN/FC>1 *strong imbalance*	FN/FC>1 *strong imbalance*	FN/FC ~ 1 *average imbalance*

Source: Designed by the authors

An algorithm for substantiating the choice of economic security management strategies of the enterprise has been developed, which allows to identify the type of crisis based on the identification of bifurcation points and their analysis and take into account the existence of an internal mechanism of development inherent in the economic security of the enterprise in a certain period - adaptation or bifurcation, according to which it is necessary to develop the relevant strategies (Figure 1).

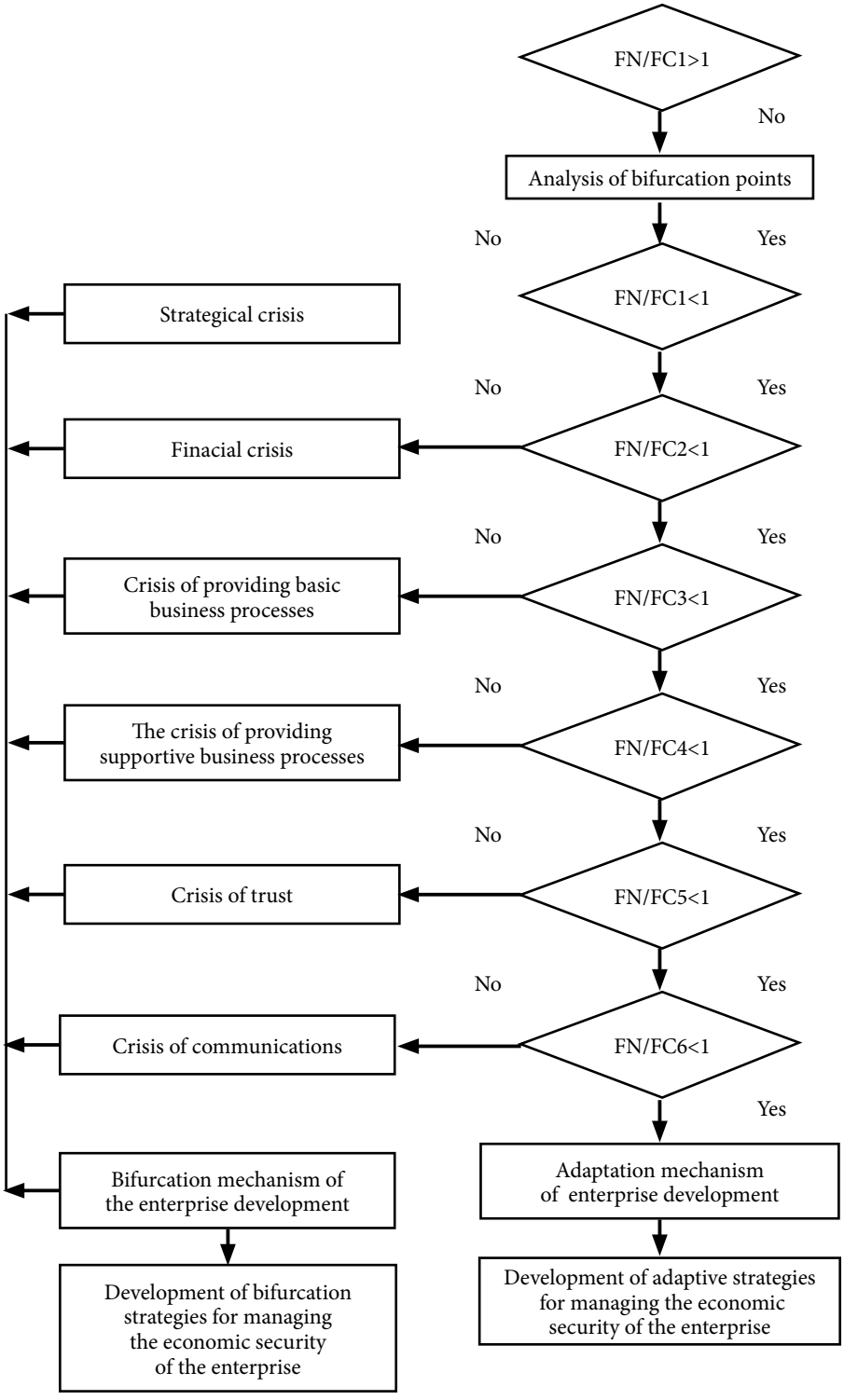

Figure 1. Algorithm of justification the choice of management strategies of economic security of the enterprise depending on internal mechanisms of its development

It is proved that the algorithm is equivalent, that is, if at least one condition is not fulfilled, then there is a need to develop bifurcation strategies for managing the economic security of the enterprise. The crisis can testify both to the approach of economic catastrophe, especially when there is a cascade of bifurcations, and to new opportunities for the development and emergence of several alternatives to transformational change. Therefore, the manager must put the right emphasis on the events that occur at the enterprise. It can be noted that if to see the norm, growth, redistribution of resources, temporary difficulties in the crisis and to convey this to the subordinates, then it is already able to manage the crisis.

Table 3 provides an identification of the type of enterprise economic security crisis based on an algorithm (Figure 1), which enables the development of appropriate strategies.

Table 3. Identification of the type of crisis of economic security of the enterprise

Condition of the crisis	Type of crisis	Characteristic features	Development of bifurcation strategies for managing the economic security of the enterprise
FN / FC1 <1	Strategic crisis	Loss of market share, low labor productivity, low capital productivity.	Protection and Survival Strategy. Breakthrough strategy. Clipping strategy superfluous. Bankruptcy Strategy. Elimination strategy.
FN / FC2 <1	Financial crisis	Insolvency, inability to satisfy creditors' claims in due time, long indebtedness to the budget, low liquidity ratios.	Asset Restructuring Strategy. Strategy of releasing own reserves. Strategy for optimization of operating expenses. Increasing revenue strategy.
FN / FC3 <1	Crisis of providing basic business processes	High level of production costs, aging of equipment whose technical characteristics do not meet the average industry standards, constant failure to fulfill plans, high percentage of defects, increase in material consumption of products, constant repairs, customer dissatisfaction with product quality, range and design, reduction of customer base, return of products, increase of productions, theft of inventory items, errors increase in the formation of orders and the high duration of order processing.	Reengineering strategy. Quality Improvement Strategy. Customization strategy. Rebranding strategy. Strategy for minimizing logistics costs.
FN / FC4 <1	Crisis of providing supportive business processes	High level of staff turnover, low level of motivation and wages, dismissal of leading highly skilled workers, internal fraud, labor lawsuits, inadequate distribution of powers, failure of the information system and equipment failure, virus infection, data disclosure, intentional corruption of data.	Termination strategy for investments. Investment Attraction Strategy. Information Systems Protection Strategy
FN / FC5 <1	Crisis of trust	Low level of image. negative image of the company and negative publications about it, loss of customers, information closure, reduction of goodwill cost, dishonesty in fulfillment of contractual obligations, affecting profitability and its capitalization, increase of legal conflicts, non-compliance with environmental standards, divergence of values between the enterprise and workers, job dissatisfaction, bureaucracy, conflict, low team spirit, worsening social and psychological climate.	Socialization strategy. Openness strategy. Maximum legal processing strategy. Strategy of harmonization of values of the enterprise with employees'values. Trust Leadership Strategy. Repositioning strategy.
FN / FC6 <1	The crisis of communications	Loss of competitive advantage or inability to counter competitive pressure, loss from external fraud, threat of corruption by regulatory authorities, increase in raider attacks (unfriendly takeover), refusal of permanent counterparties to cooperate, violation of supply rhythm.	Merger strategy. Client-oriented strategy. Supplier Termination Strategy.

Source: Designed by the authors

Adaptation strategies include support or early prevention strategies based on: the formation and use of special reserve funds, risk redistribution (diversification, hedging), stockpiling of resources and management systems, renewal of fixed assets through long-term loans and financial leasing, economic and social responsibility, harmonization of interests and values of internal and external stakeholders, formation of competitive, innovative position. Therefore, the methodology of assessing the economic security of the enterprise allows: studying its degree and status in dynamics, identifing and analyzing the points of bifurcation, identifing the type of crisis and developing appropriate strategies for managing the economic security of the enterprise.

5. Discussion

The high level of economic security of the enterprise depends on the formation of synergistic effects, as well as on the ability to establish coherent or coordinated relationships that will lead to cooperative processes. This determines the urgency of entropy utilization and its transformation into synergy.

The main task of synergistic management of the economic security of the enterprise is not so much the combination of resources and interests of stakeholders, but the creation of a coherent potential, namely the combined potential of mutually supportive relationships, relationships and concerted behavior. They can mutually reinforce each other, which increases their overall performance. As noted above, this phenomenon is called synergy, or "joint effect" or "one-vector effect" (Okewu, E., et al. (2017)).

Therefore, increasing coherent capacity is tantamount to acquiring a new resource, the emergence of a new productive force, or qualitatively new sources of development, and reducing it is tantamount to actually losing the resource. Consistency of business processes provide positive and negative feedbacks.

Functional synergistic effect is the result that is equivalent to the sum of the components. It occurs when the business processes of the enterprise are parallel (for example, in the process of exchanging job responsibilities for wages).

A positive synergistic effect is a result that exceeds the sum of the components. It arises at the intersection of the business processes of the enterprise as a result of the alignment of their internal and external vectors, which are aimed at the same goal (for example, efficiency of a cohesive team is much higher than the individual workers who simply perform their duties).

A negative synergistic effect is a result that is less than the sum of the components. It arises when there are differences in the parallel or interacting business processes of the enterprise (for example, team conflict or combination of unskilled workers and new equipment). That is, when the goals of one business process become more prioritized and overlap with the goals of another business process, their divergence becomes inevitable as a result of the mismatch of their vectors, which are aimed at different goals.

Therefore, it can be noted that the greatest potential of synergism in an enterprise lies in its staff, which is a source of self-organization and self-disorganization. Therefore, it is necessary to implement innovative training methods with the involvement of consulting firms (teambuilding, teamspirit, corporate time management, mind-management, coaching, mentoring, tutoring, budding, mastering, secondment, learning by idea, business, metaphorical and metaphorical games.

The practical significance of the results of the study is to achieve a stable equilibrium through the implementation of a synergistic principle – minimizing entropy production and maximizing synergy production.

Conclusions

A descriptive model of the interrelation of synergistic laws and patterns with the economic security of the enterprise is offered, which allowed to develop and substantially fill in the tools of the synergistic management of the economic security of the enterprise from the positions of the thesaurus of security science and synergetics, namely: algorithm for justifying the choice of strategies for managing the economic security of the enterprise, depending on the internal mechanisms of its development; a synergistic model of firm sustainability in the context of managing its economic security; scientific and methodological approach to forming the effect of synergism in managing the economic security of the enterprise.

Methodological provisions have been developed to determine the nature and assessment of resistance of economic security of an enterprise, which is the ability to resist it as an ectropic factor to the impact of environmental threats, namely the supersystems (industries and countries) as an entropy factor, as well as ability coordinately to respond to threats that, in turn, allows determining the status and degree of resistance of the economic security of the enterprise in dynamics, identifying and analyzing bifurcation points, identifying the type of crisis and developing appropriate strategies for managing the enterprise's economic security.

It is outlined that the entropy factor is an external environment, which brings chaos and uncertainty in the form of energy and resources flow, thus disturbing the state of stable equilibrium of the internal environment of the enterprise until cardinal restructuring. The ectropic factor is the status of economic security of the enterprise, which determines the chances of the enterprise for long-term survival under the changing conditions of the environment.

If the level of economic security of the enterprise is higher than the level of economic security of the supersystem, then it indicates the ability of the enterprise to resist destructive influences and ability to protect against threats of the supersystem, as well as its reliability, stability, integrity. If the level of economic security of the enterprise is lower than the level of economic security of the supersystem, then this indicates that the enterprise lacks resources and competencies to overcome the environmental resistance, which can cause destruction / bankruptcy and require the introduction of a bifurcation mechanism.

Prospects for further research are the development of economic security scenarios based on synegetic management. Modeling an enterprise's economic security system is a fairly complex process. A reliable system of economic security of the enterprise is possible only if a comprehensive and systematic approach is used. This system provides an opportunity to evaluate the development prospects of the enterprise, develop its tactics and strategy, reduce the negative impact of threats and dangers. Therefore, it is considered necessary to investigate the applied aspects of the mechanism application of managing the enterprise's economic security in specific industries using the features and directions of their development.

References

Augutis, J., Krikštolaitis, R., Martišauskas, L., Pečiulytė, S., & Žutautaitė, I. (2017). Integrated energy security assessment. Energy, 138, 890-901. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0360544217312914

Chehabeddine, M., Tvaronavičienė, M. (2020). Securing regional development. Insights into Regional Development, 2(1), 430-442. http://doi.org/10.9770/IRD.2020.2.1(3)

Dorondel, S., & Şerban, S. (2018). Dissuading the state: food security, peasant resistance and environmental concerns in rural Bulgaria. Canadian Journal of Development Studies/Revue canadienne d'études du développement, 1-16. Available at: https://www.tandfonline.com/doi/abs/10.1080/02255189.2018.1498326

Drobyazko S., Okulich-Kazarin V., Rogovyi A., Goltvenko O., Marova S. (2019). Factors of Influence on the Sustainable Development in the Strategy Management of Corporations. Academy of Strategic Management Journal. Volume 18, Special Issue 1 (Title: Strategic Research Directions), 2019. URL: https://www.abacademies.org/articles/Factors-of-influence-on-the-sustainable-development-in-the-strategy-management-of-corporations-1939-6104-18-SI-1-439.pdf

Drobyazko, S., Vinichenko, O., Chayka, Y., Nechyporuk, N., & Khasanov, B. (2020). Increasing efficiency of entrepreneurial potential in service sector. Journal of Entrepreneurship Education, 23(S1). URL: https://www.abacademies.org/articles/Increasing-efficiency-of-entrepreneurial-potential-1528-2651-23-S1-551.pdf

Dudin, M. N., Fedorova, I. J. E., Ploticina, L. A., Tokmurzin, T. M., Belyaeva, M. V., & Ilyin, A. B. (2018). International practices to improve economic security. Available at: https://www.um.edu.mt/library/oar//handle/123456789/30294

Hilorme, T., Tkach, K., Dorenskyi, O., Katerna, O., & Durmanov, A. (2019). Decision making model of introducing energy-saving technologies based on the analytic hierarchy process. Journal of Management Information and Decision Sciences, 22(4), 489-494. Available at: https://www.abacademies.org/articles/decision-making-model-of-introducing-energy-saving-technologies-based-on-the-analytic-hierarchy-process.pdf

Ianioglo, A. (2018). Features of Determining Indicators of Operating Activitiy in Evaluating the Economic Security of Enterprise. Revista de studii interdisciplinare „C. Stere", 19(3-4), 98-107. Available at: https://zenodo.org/record/3360619

Lusardi, A., & Mitchell, O. S. (2017). How ordinary consumers make complex economic decisions: Financial literacy and retirement readiness. Quarterly Journal of Finance, 7(03), 1750008. Available at: https://doi.org/10.1142/S2010139217500082

Nan, S., & Wang, Y. (2018). Study on the Strategic Transformation of Enterprise Management based on Economic Globalization. Available at: https://pdfs.semanticscholar.org/d896/1f9ce662fbde8913097b482dcdb475ca340e.pdf

Okewu, E., Misra, S., Maskeliūnas, R., Damaševičius, R., & Fernandez-Sanz, L. (2017). Optimizing green computing awareness for environmental sustainability and economic security as a stochastic optimization problem. Sustainability, 9(10), 1857. https://doi.org/10.3390/su9101857

Peppers, S. F. (2017). Entrepreneurial security: a free-market model for national economic security. Economics and statistics, (1), 28-36. Available at: https://www.hsaj.org/articles/245

Plėta, T., Tvaronavičienė, M., Della Casa, S. (2020)**.** Cyber effect and security management aspects in critical energy infrastructures. *I*nsights into Regional Development*,* 2(2), 538-548. https://doi.org/10.9770/IRD.2020.2.2(3)

Raji, S. A., & Ogunrinu, A. (2018). Chinese Investment And Its Implications For Nigeria's Economic Security. Brazilian Journal, 3(6), 123-142. Available at: https://www.seer.ufrgs.br/rbea/article/viewFile/91180/52386#page=123

Schatz, D., & Bashroush, R. (2017). Economic valuation for information security investment: a systematic literature review. Information Systems Frontiers, 19(5), 1205-1228. Available at: https://link.springer.com/article/10.1007/s10796-016-9648-8

Schimmel, K., Liu, S., Nicholls, J., Nechval, N. A., & Forrest, J. Y. L. (2017). Economic security under disturbances of foreign capital. Advances in Systems Science and Applications, 17(2), 14-28. https://doi.org/10.25728/assa.2017.17.2.12

Simanavičienė, Ž., & Stankevičius, A. (2017). Economic security and national competitiveness. Available at: https://repository.mruni.eu/handle/007/15011

Sohn, Y. (2019). South Korea under the United States–China rivalry: dynamics of the economic-security nexus in trade policymaking. The Pacific Review, 32(6), 1019-1040. https://doi.org/10.1080/09512748.2019.1617770

Tetiana, H., Chernysh O., Levchenko, A., Semenenko, O., Mykhailichenko H. (2019). Strategic Solutions for the Implementation of Innovation Projects. Academy of Strategic Management Journal. Volume 18, Special Issue 1. Available at: https://www.abacademies.org/articles/Strategic-solutions-for-the-implementation-of-innovation-projects-1939-6104-18-SI-1-444.pdf

Tvaronavičienė, M., Masood, O., & Javaria, K. (2018). Preconditions of the Eurozone economic security: how to overcome liquidity risk and cost inefficiency in leading banks of UK and Germany. Polish journal of management studies, 18. Available at: http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.baztech-100300af-feea-4d11-be52-d2971df0c0a0

Yu, C. (2018). Security Complex of Bordering Area from Perspective of Overall National Security Ideas: Regional and Integrated Perspective of Bordering Area Security. Journal of Northwest Minzu University (Philosophy and Social Science), (3), 5. Available at: http://en.cnki.com.cn/Article_en/CJFDTotal-XBMZ201803005.htm

Zhou, J., Wang, C., Li, Y., Wang, P., Li, C., Lu, P., & Mo, L. (2017). A multi-objective multi-population ant colony optimization for economic emission dispatch considering power system security. Applied Mathematical Modelling, 45, 684-704. https://doi.org/10.1016/j.apm.2017.01.001

Lidiia KARPENKO, Doctor in Economics, Professor, Odessa Regional Institute for Public Administration of the National Academy for Public Administration under the President of Ukraine
ORCID ID: orcid.org/0000-0002-2888-2477

Oksana ZHYLINSKA, Doctor in Economics, Professor, Taras Shevchenko National University of Kyiv, Ukraine
ORCID ID: orcid.org/0000-0001-8366-0474

Hennadii DMYTRENKO, Doctor in Economics, Institute for Personnel Training of the State Employment Service of Ukraine
ORCID ID: orcid.org/0000-0003-3368-3410

Nataliia V. POPROZMAN, Doctor in Economics, National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine
ORCID ID: orcid.org/0000-0001-8402-3389

Viktoriia KOLTUN, Doctor of Science in Public Administration, Associate Professor, National Academy for Public Administration under the President of Ukraine
ORCID ID: orcid.org/0000-0001-8432-873X