COMPREHENSIVE ASSESSMENT OF FINANCIAL MANAGEMENT OF ECONOMIC SECURITY OF AN ENTERPRISE IN THE CONDITIONS OF INNOVATIVE ECONOMY

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Abstract

Uncertainty and high turbulence of the processes of the functional environment of the enterprise provokes a large number of risks in the enterprise. All of the above necessitate the search for ways to prevent risks or minimize their negative consequences for the enterprise. This, in turn, actualizes the problems assessment of the financial management of the economic security of a modern enterprise in an innovative economy. The purpose of the article is to model a comprehensive assessment of the financial management of the economic security of a modern enterprise in an innovative economy.

The materials of the study were the data of enterprises, namely: PJSC Interpipe Nizhnedneprovsky tube rolling plant, PJSC Sumykhimprom, PJSC SIC Borshchahivskiy, and PJSC Azovstal iron and steel works. To model a comprehensive assessment of the modern enterprise economic security financial management in an innovative economy it is proposed to use multivariate factor analysis in combination with the method of chain substitutions. This helped to develop a system of adaptive assessment of the financial management of the economic security of an enterprise, taking into account changes in the external and internal environment.

The result of the study is an algorithm developed by the authors for assessing the financial management of the economic security of an enterprise using an integrated approach. This approach involves the decomposition of the financial management assessment of the economic security of an enterprise into subsystems, as well as the choice of indicators characterizing these subsystems, the calculation of integral indicators for each of the subsystems and the final calculation of the level of economic security of the subject of entrepreneurial activity. The following subsystems have been identified: operational, financial, personnel, as well as innovative and technological, which meets the conditions of sustainable development of the enterprise. Conducting a comprehensive assessment of the financial management of the economic security of an enterprise using factor analysis allows us to assess the degree of impact of each factor-subsystem included in the system of managing the economic security of an enterprise, and allows us to adequately adjust existing measures to ensure the target level of economic security.

Modeling a comprehensive assessment of the financial management of economic security allows the enterprise to carry out adaptive management actions

to minimize costs, reduce risks and plan activities for a prompt response to changes in the external environment. Modeling helps to obtain information that can be used to adjust management decisions, plan and implement operational measures to improve the economic security of an enterprise in an innovative economy.

Key words: *Economic Security, Finance, Management, External Environment, Risks, Management Decisions.*

1. Introduction

The global trend of increasing the cost of human life leads to increased attention to such a phenomenon as security. In today's world, security is the quintessence of many institutions at different levels.

The increasing attention to security issues has directed the attention of scientists in this direction and has led to the formation of various definitions of the term security. In modern conditions, ensuring national security is one of the goals of state policy and a necessary condition for the sustainable development of the country. Proceeding from the fact that economic relations are one of the most important aspects of public life, economic security is an important component of the national security system. In turn, enterprises are one of the key subjects of the national economy. Uncertainty and high turbulence of the processes of the functional environment of the enterprise provokes a large number of risks in the enterprise. All of the above necessitate the search for ways to prevent risks or minimize their negative consequences for the enterprise. This, in turn, actualizes the problems of the enterprise economic security.

An important element of the economic security management system of an enterprise is the assessment of its level. It is the constant monitoring of the level of the enterprise economic security that guarantees the development of adequate measures to ensure economic security, the most efficient implementation of the enterprise's potential and as a result of its most efficient functioning and sustainable development.

The scientific literature analysis showed that the term economic security began to gain popularity in the United States during the Great Depression. On the territory of post-Soviet countries, including Ukraine, it began to be applied in the early 90s of the previous century, reflecting the need for enterprises to function in the context of the transformation of the national economy and face new risks and threats. In modern conditions of growing uncertainty of the national economy, research on the category of economic security remains relevant.

Many foreign and domestic scientists devoted their work to the study of various aspects of economic security, in particular, the enterprise economic security management. It is advisable to note that economic security as a complex phenomenon can be considered at several levels: microlevel – the level of an individual or household, mesolevel - the level of an enterprise, sectoral or regional level, macrolevel – the level of the national economy, global level. The analysis highlights the differences in the perception of the category of economic security. Thus, representatives economic science concentrated their efforts on the study of economic security at the macrolevel [1 - 7] and the microlevel [8 - 11], while other scientists pay more attention to the study of the mesolevel [12 - 14], in particular the economic security of the enterprise [15 - 17]. It should be noted that some scientists use the term enterprise economic security in their works [18 - 20], however, it received neither clear interpretation nor practical application. The theory of innovative support of economic security of enterprises of various branches is developed in the works of scientists [21 - 30].

The term enterprise economic security continues to evolve. So in the early 90s, domestic scientists investigated internal risks, in particular the risk of negative consequences due to the leakage of commercial secrets through staff disloyalty. Then the researchers' attention shifted towards the analysis of the external environment and its threats to the enterprise. At the present stage, much attention is paid to the study of various aspects of the economic security of an enterprise operating in conditions of rapid changes in internal and external threats to the functional environment. Some scholars devoted their works to the generalization of the definitions of the enterprise economic security. In their work, Shutyak *et al.*, [31], analyzes the definitions of risk, threat and enterprise economic security, pointing to the difference in the perception of these categories by domestic and foreign researchers. She emphasizes that the concept of the enterprise economic security generalizes other concepts, such as competitiveness, profitability, etc., which indicate only one aspect of complex systems, neglecting others. Ianioglo and Põlajeva [32], define the enterprise economic security as a condition characterized by the ability of an economic agent to ensure the efficient use of resources and opportunities to prevent threats and increase competitive advantages, which will ensure stable operation and development in order to achieve business goals.

Scientists pay a lot of attention to the study of the structure of the enterprise economic security system. Thus, in their work, Chernysheva *et. al.*, [33], distinguish

the following functional elements: financial and economic, technical and technological, political and legal, information, environmental, personnel, intellectual and power. Ianioglo and Põlajeva [32], highlights many components, namely: finance, human resources, manufacturing, technology, innovation. Some scholars examine structure in a specific context. For example, in the context of the digital economy, Matukova *et. al.*, [34], distinguish the following components: executive security, industrial security, financial security, information security and legal security.

The diagnosis of economic security as an important aspect of ensuring effective and adaptive modern management has attracted the attention of many scientists. In their work, Polzun [35], Shumilina and Yakimenko [36], prove the relevance of economic security assessment, identify destabilizing factors that affect it, and justify the financial reserves that need to be accumulated by the company for financial stability. The authors propose an algorithm for composing a system of economic security assessment indicators, as well as provide recommendations for its integrated assessment. In order to determine the impact of internal and external factors on the security of an enterprise, the authors rank the risk areas, carry out forecast trajectories of optimal economic development, which will provide the best security for market actors. Sergeeva and Chunaev [37], investigate the methods of the comprehensive assessment of economic security under conditions of a systemic crisis and destabilizing factors coming from the institutional environment. The authors pay special attention to the contradictory points in each of the methods, identify their weaknesses, and additionally to economic-mathematical modeling and forecasting, offer their own methods of assessing economic security. The scientists have developed the phased assessment of economic security from the standpoint of a functional approach. Kankhva and Silka [38], deepened the existing methods of assessing economic security, offering their own recombination of financial and economic indicators and their integrated assessment, which is essential to determine the real state of security of an enterprise and its sources. Thus, at this time a fairly deep theoretical and methodological basis for assessing economic security has been created, which contains the necessary concepts, indicators, and algorithms, the use of which in the practical activities of enterprises has proven their high value. However, the turbulence of the external environment, the instability of the internal system of an enterprise, and changes in the logic of doing business require further deepening of the procedure for assessing the economic security of an enterprise, which takes into account a more extensive system of indicators and especially their recombination.

The article aims to develop an algorithm for integrated assessment of the economic security of an enterprise taking into account the modern specifics of their activities.

2. Materials and Methods

The materials of the study were the data of enterprises, namely: PJSC Interpipe Nizhnedneprovsky tube rolling plant, PJSC Sumykhimprom, PJSC SIC Borshchahivskiy, and PJSC Azovstal iron and steel works.

In order to model a comprehensive assessment of the modern enterprise economic security financial management in an innovative economy it is proposed to use multivariate factor analysis in combination with the method of chain substitutions. This helped to develop a system of adaptive assessment of the financial management of the economic security of an enterprise, taking into account changes in the external and internal environment.

In other words, in order to achieve the aim of the article, it is advisable to build an integrated indicator of assessing of financial management of economic security of an enterprise in the conditions of innovative economy, to make a factor analysis of economic security with the help of chain substitutions, which has a universal character and can be used by any enterprise.

3. Results and Discussion

The functioning of modern enterprises and their interaction with the external environment is characterized by complex processes, forms a need for the creation of effective control systems and monitoring of economic and management processes, in particular the enterprise economic security management.

Each enterprise operates in a unique environment that has historically evolved for a particular enterprise, so there are many combinations of risks that individual enterprises face in an innovative economy. Even the external environment, which forms external risks, for example, due to the influence of the institutional environment or the functioning of the target market, and looks the same for all economic entities that are within the influence of this environment, but generates risks with varying degrees of criticality for individual enterprises. Certainly, the internal conditions that form internal risks are a set of exclusive relationships and interconnections within the enterprise. This combination significantly affects the functioning and development of the economic security management system due to a significant impact on the adaptation level of the enterprise to current risks. The adaptation of enterprises and their management systems occurs

by regulating the processes of making managerial decisions in the management system of the enterprise as a whole, and in particular in the management of economic security.

Modern conditions for the functioning of enterprises impose many requirements on the management system of the enterprise economic security, in particular, the methodology for assessing the level of security. The economic security management system of the enterprise operates in conditions of a significant increase in the volume of information flows, on the one hand, it allows more accurate risk analysis and monitoring of the effectiveness of economic security management, and on the other hand, it creates information noise that impedes the effective functioning of economic security management. Therefore, the assessment methodology should be of theoretical and practical significance.

In view of this, it is advisable to use the following algorithm for assessing of financial management of economic security of an enterprise in the conditions of innovative economy using an integrated approach that provides for the decomposition of the enterprise economic security system into subsystems, the choice of indicators that characterize these subsystems, the calculation of integral indicators for each of the subsystems and an integral indicator, the use of the method of chain substitutions for this analysis. A schematic view of the algorithm is shown in Figure1.
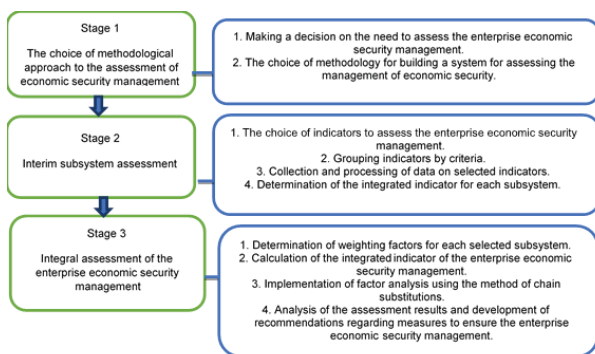

Figure 1. Algorithm for assessing of financial management of economic security of an enterprise in the conditions of innovative economy (Source: compiled by the authors)

An important stage in assessing of financial management of economic security of an enterprise in the conditions of innovative economy is the composition of a set of subsystems, which most accurately characterizes the functioning of an enterprise and allows an accurate assessment of the state of economic security to be obtained. For each subsystem it is important to choose a set of indicators

that meet the following requirements: most likely characterize the state of the subsystem, allow to assess the results of economic security management measures, the source of data for calculating indicators is the internal accounting system.

According to the authors, it is advisable to single out the following subsystems: operating, financial, personnel and also innovation and technological, which corresponds to the conditions of sustainable development of the enterprise.

The operating subsystem reflects the activities of the enterprise, which are associated with the production and sale of products (goods, works, services), as well as other activities that do not fall into the category of investment and financial activities. For this subsystem, the following indicators can be selected: return on assets, profitability of products sold, profitability of operating activities, etc.

The financial subsystem reflects activities leading to changes in the size and composition of the company's equity and debt capital, and is also associated with the effective investment of attracted capital. For this subsystem, the following indicators can be selected: financial stability ratio, total solvency ratio, financial leverage ratio, break-even point, financial safety factor, debt ratio, etc.

The personnel subsystem reflects the activities of the enterprise, covers the development of organizational principles for working with people, the formation and rational use of labor resources, ensuring the effectiveness of their development. The following indicators can be chosen to characterize this subsystem: staff turnover rate (inverse), labor productivity, labor force utilization efficiency, etc.

The innovation-technological subsystem reflects the activity of creating, using and distributing innovations in order to gain competitive advantages and increase the profitability of production. It is characterized by indicators of the level of technological renewal of industrial production, which is proposed to be established according to indicators of the efficiency of using fixed assets and technologies, the efficiency of introducing innovations, namely: the rate of disposal of fixed assets, the coefficient of usefulness of fixed assets, the coefficient of efficiency of innovative costs, the coefficient of introducing new technological processes, etc.

It should be noted that the set of indicators is selected by the management of the enterprise, focusing on the specificity of the goals and the functional environment of the enterprise. The construction of an optimal set of

indicators that characterize the subsystems selected for monitoring is a space for further scientific research.

Thus, as a practical example, we assume that the enterprises N1 (PJSC Interpipe Nizhnedneprovsky TUBE rolling plant), N2 (PJSC Sumykhimprom), N3 (PJSC Sic Borshchahivskiy CPP), N4 (PJSC Azovstal iron and steel works) have the following indicators of these subsystems (Table 1).

We propose to calculate the integral indicators for each subsystem using the formula (1):

$$G_i = \sqrt[n]{|K_1 \cdot K_2 \cdot \cdots \cdot K_n|} \qquad (1)$$

Where G_i - integral indicator of the i-th subsystem; $i = \overline{1, m}$; m - the number of selected subsystems in the system of enterprise economic security; n - the number of selected indicators for a separate i-th subsystem; K_n – n-th indicator that characterizes a particular subsystem.

Table 1. Partial indicators characterizing the activities of enterprises N1, N2, N3, N4 in the context of selected subsystems for 2019, 2020

	Indicators K_i	N1		N2		N3		N4	
		Previous period	Reporting period	Previous period	Reporting period	Previous period	Reporting period	Previous period	Reporting period
Operating	Return on assets ratio (K_1)	0.015	0.045	-0.005	1.022	0.013	0.027	0.011	-0.017
	Return on equity ratio (K_2)	0.428	0.308	0.006	-0,141	0.016	0.035	0.032	-0.053
	Profitability ratio (K_3)	0.075	0.244	-0.011	-0.384	0.062	0.133	0.044	-0.099
	Product profitability ratio (K_4)	0.161	0.368	0.075	-0.597	0.151	0.214	0.067	-0.135
	Equity capital turnover (K_5)	22.740	5.051	-2.321	-2.129	1.025	1.044	2.911	2.159
	Asset turnover (K_6)	0.798	0.735	1.901	1.684	0.848	0.807	0.968	0.677
	Inventory turnover (K_7)	8.938	6.237	8.632	7.621	2.472	2.295	6.729	7.585
Financial	Working capital turnover ratio (K_8)	5.759	5.912	1.307	1.212	4.010	3.945	7.737	5.735
	Coverage ratio (total liquidity) (K_9)	0.911	1.254	0.242	0.257	2.097	2.373	1.065	0.855
	Rapid liquidity ratio (K_{10})	0.832	1.123	0.130	0.152	1.035	1.138	0.872	0.739
	Absolute liquidity ratio (K_{11})	0.035	0.090	0.003	0.003	0.039	0.047	0.015	0.008
	Share of current assets in the assets of the enterprise (K_{12})	0.817	0.801	0.401	0.419	0.384	0.363	0.655	0.538
	Share of own working capital in current assets (K_{13})	-0.152	0.149	-3.504	-3.240	0.510	0.544	0.026	-0.239
	The share of inventories in current assets (K_{14})	0.086	0.104	0.461	0.408	0.506	0.520	0.184	0.139
	Bankruptcy forecast ratio (K_{15})	-0.080	0.162	-1.261	-1.215	0.201	0.210	0.041	-0.094
	Financial stability ratio (K_{16})	0.065	0.353	-0.485	-0.475	4.425	5.173	0.526	0.458
	Functioning capital flexibility ratio (K_{17})	-0.255	0.483	-0.003	-0.004	0.036	0.036	0.562	-0.038
Personnel	Labor productivity, USD /person (K_{18})	2677.747	3152.540	564.574	527.429	1596.791	1589.797	8055.915	5170.394
	Staff turnover ratio (inverse) (K_{19})	16.461	9.998	13.500	16.400	23.132	21.429	20.977	26.258
	Labor efficiency ratio (K_{20})	0.940	0.970	0.980	0.990	0.980	0.980	0.980	0.990
Innovation and technological	Update ratio (K_{21})	0.142	0.204	0.064	0.040	0.015	0.013	0.048	0.087
	Depreciation reserve ratio (K_{22})	0.590	0.590	0.420	0.410	0.541	0.511	0.808	0.959
	The efficiency ratio of innovation spending (K_{23})	0.100	0.130	0.230	0.340	0.189	0.410	0.290	0.360

Source: compiled by the authors

For the enterprise *N1*, calculations of integral indicators for each subsystem have the form:

- For the operating subsystem for the previous and reporting period, respectively:

$$G_{op}^0 = \sqrt[7]{K_1 \cdot K_2 \cdot \cdots \cdot K_7} = 0{,}535$$
$$G_{op}^1 = 0{,}602$$

- For the financial subsystem for the previous and reporting period, respectively:

$$G_f^0 = \sqrt[10]{K_8 \cdot K_9 \cdot \cdots \cdot K_{17}} = 0{,}272$$
$$G_f^1 = 0{,}438$$

- For the personnel subsystem for the previous and reporting period, respectively:

$$G_p^0 = \sqrt[3]{K_{18} \cdot K_{19} \cdot K_{20}} = 34{,}603$$
$$G_p^1 = 31{,}269$$

- For innovation and technological subsystem for the previous and reporting period, respectively:

$$G_t^0 = \sqrt[n]{K_{21} \cdot K_{22} \cdot K_{23}} = 0{,}203$$
$$G_t^1 = 0{,}250$$

The results of calculations of integral indicators for each subsystem of the enterprises N1, N2, N3, and N4 are shown in the Table 2.

Analysis of the integral indicators of individual subsystems makes it possible to highlight relevant areas for a more detailed study of the existing risks. Within the framework of this study, the results are visualized in the form of radar diagrams, which clearly reflect the changes in the integral indicators of the enterprises N1, N2, N3, and N4 over time (Figure 2).

In order to build a factor model of economic security management of the enterprise, it is advisable to
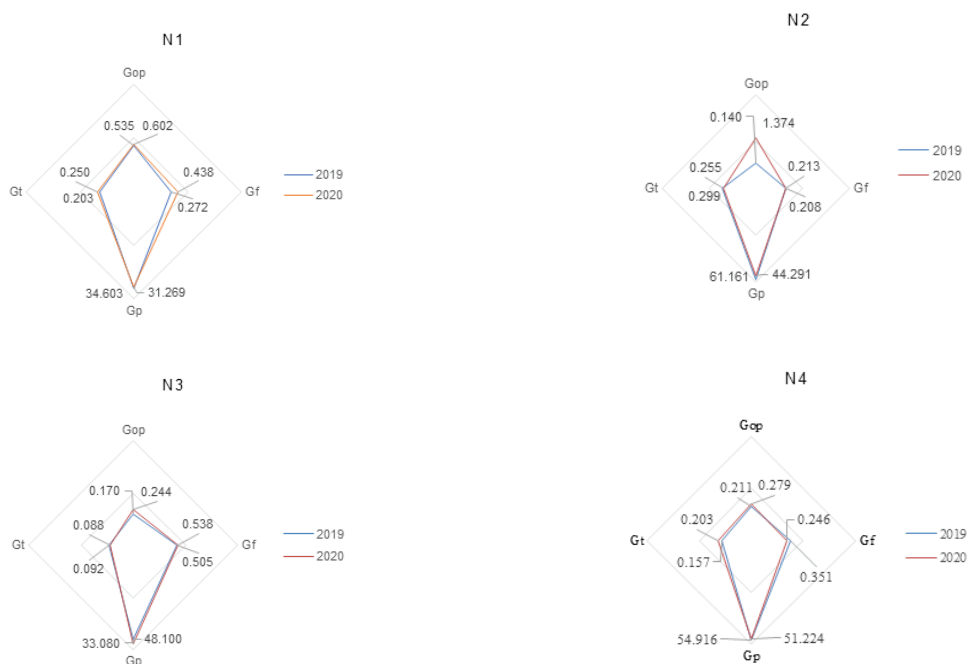

Figure 2. Integral indicators of subsystems of financial management of the economic security of a modern enterprise N1, N2, N3, N4
Source: compiled by the authors

Table 2. The value of integral indicators for each subsystem of enterprises N1, N2, N3, N4

Integral indicators	N1		N2		N3		N4	
	Previous period	Report. period	Previous period	Report. period	Previous period	Report. period	Previous period	Report. period
G_{op}	0.535	0.602	0.140	1.374	0.170	0.244	0.211	0.279
G_f	0.272	0.438	0.208	0.213	0.505	0.538	0.351	0.246
G_p	34.603	31.269	61.161	44.291	33.080	48.100	54.916	51.224
G^t	0.203	0.250	0.299	0.255	0.092	0.088	0.157	0.203

Source: compiled by the authors

use the integral indicator E, which characterizes the management of economic security of the enterprise:

$$E = \sum_{i=1}^{m} \alpha_i \cdot G_i \qquad (2)$$

Where: E - an integral indicator that characterizes the management of economic security of the enterprise; α_i - the weighing coefficient of the separate i-th subsystem, obtained by the method of expert evaluation; G_i - an integral indicator that characterizes a separate i-th subsystem of economic security of the enterprise; m - the number of isolated subsystems in the structure of economic security of the enterprise, $m = \overline{1,4}$.

The obtained factor model can be used to determine the impact of a single factor-subsystem on the management of economic security of the enterprise. For this purpose, the method of chain substitutions is applied to model (2).

$$E^0 = \alpha_{op} \cdot G_{op}^0 + \alpha_f \cdot G_f^0 + \alpha_p \cdot G_p^0 + \alpha_t \cdot G_t^0 \qquad (3)$$

$$E^1 = \alpha_{op} \cdot G_{op}^1 + \alpha_f \cdot G_f^1 + \alpha_p \cdot G_p^1 + \alpha_t \cdot G_t^1 \qquad (4)$$

$$\Delta E = E^1 - E^0 \qquad (5)$$

$$E' = \alpha_{op} \cdot G_{op}^1 + \alpha_f \cdot G_f^0 + \alpha_p \cdot G_p^0 + \alpha_t \cdot G_t^0 \qquad (6)$$

$$\Delta E_{op} = E' - E^0 \qquad (7)$$

$$E'' = \alpha_{op} \cdot G_{op}^1 + \alpha_f \cdot G_f^1 + \alpha_p \cdot G_p^0 + \alpha_t \cdot G_t^0 \qquad (8)$$

$$\Delta E_f = E'' - E' \qquad (9)$$

$$E''' = \alpha_{op} \cdot G_{op}^1 + \alpha_f \cdot G_f^1 + \alpha_p \cdot G_p^1 + \alpha_t \cdot G_t^0 \qquad (10)$$

$$\Delta E_p = E''' - E'' \qquad (11)$$

$$E'''' = E^1 = \alpha_{op} \cdot G_{op}^1 + \alpha_f \cdot G_f^1 + \alpha_p \cdot G_p^1 + \alpha_t \cdot G_t^1 \qquad (12)$$

$$\Delta E_t = E^1 - E''' \qquad (13)$$

Where: E^1, E^0 - an integral indicator of the enterprise economic security management for the reporting and previous period; $\alpha_{op}, \alpha_f, \alpha_p, \alpha_t$ - weighing coefficients for operating, financial, personnel, innovation and technological subsystems, obtained by the method of expert assessment; $G_{op}^1, G_f^1, G_p^1, G_t^1$ - integral indicators of operating, financial, personnel, innovation and technological subsystems for the reporting period; $G_{op}^0, G_f^0, G_p^0, G_t^0$ - integral indicators of operating, financial, personnel, innovation and

technological subsystems for the previous period; E', E'', E''', E'''' - intermediate values of the integral indicator of the enterprise general safety; $\Delta E_{op}, \Delta E_f, \Delta E_p, \Delta E_t$ - changes obtained due to the operation of operating, financial, personnel, innovation and technological subsystems for the reporting period.

The application of factor analysis using the method of chain substitutions to assess the management of economic security of the studied enterprise *N1* gives the following results:

$$= 1 \cdot 0,535 + 1 \cdot 0,272 + 1 \cdot 34,603 + 1 \cdot 0,203 = 35,$$
$$E^1 = 1 \cdot 0,602 + 1 \cdot 0,438 + 1 \cdot 31,269 + 1 \cdot 0,25 = 32,559$$
$$\Delta E = 32,559 - 35,614 = -3,055$$
$$E' = 1 \cdot 0,602 + 1 \cdot 0,272 + 1 \cdot 34,603 + 1 \cdot 0,203 = 35,680$$
$$\Delta E_{op} = 35,680 - 35,614 = 0,066$$
$$E'' = 1 \cdot 0,602 + 1 \cdot 0,438 + 1 \cdot 34,603 + 1 \cdot 0,203 = 35,846$$
$$\Delta E_f = 35,846 - 35,680 = 0,166$$
$$E''' = 1 \cdot 0,602 + 1 \cdot 0,438 + 1 \cdot 31,269 + 1 \cdot 0,203 =$$
$$\Delta E_p = 32,512 - 35,846 = -3,334$$
$$E^1 = 1 \cdot 0,602 + 1 \cdot 0,438 + 1 \cdot 31,269 + 1 \cdot 0,25 =$$
$$\Delta E_t = 32,512 - 32,559 = -0,047$$

It should be noted that in order to avoid distortions, the weighing coefficients $\alpha_{op}, \alpha_f, \alpha_p, \alpha_t$ were taken as 1. The results of calculations of $E^1, E^0, \Delta E, \Delta E_{op}, \Delta E_f, \Delta E_p, \Delta E_t$ using the method of chain substitutions for enterprises N1, N2, N3, and N4 are given in Table 3.

Calculations show that during the reporting period, the coefficients of economic security management of enterprises *N1, N2, N4* decreased by 3.055, 15.675, and 3.682, respectively. This indicates a decrease in the level of efficiency of management of economic security of enterprises N1, N2, N4. The most significant decrease in efficiency occurred at the enterprise *N2*, where it was recorded significant negative changes in the functioning of the personnel subsystem, for which $\Delta E_p = -16,870$. The negative impact of this subsystem was also faced by enterprises N1, N4, for which ΔE_p is -3.334 and -3.692, respectively. Also, the negative impact in the reporting period was due to negative changes in the innovation and technology subsystem of the enterprises N1, N4, for which ΔE_t is -0.047 and -0.046, respectively. The efficiency of economic security management of the enterprise N4 also decreased due to negative changes in the financial subsystem $\Delta E_f = -0,105$. At the same time, positive changes took place in the operating subsystem of all surveyed enterprises and the financial subsystem of the

Table 3. Indicators $E^1, E^0, \Delta E, \Delta E_{op}, \Delta E_f, \Delta E_p, \Delta E_t$ for the enterprises N1, N2, N3, N4

	E^0	E^1	ΔE	ΔE_{op}	ΔE_f	ΔE_p	ΔE_t
N1	35.614	32.559	-3.055	0.066	0.166	-3.334	-0.047
N2	61.808	46.133	-15.675	1.234	0.005	-16.870	0.044
N3	33.847	48.970	15.123	0.073	0.033	15.021	0.004
N4	55.634	51.952	-3.682	0.069	-0.105	-3.692	-0.046

Source: compiled by the authors

enterprises N1, N2, N3, reflecting the relevant indicators ΔE_f is 0.166, 0.005 and 0.033, respectively. However, in terms of improving the efficiency of economic security management of the enterprise, it is important to pay special attention to the study of risks that are formed in the functional area of the subsystems in which the negative changes took place. Based on this, the management of the enterprises N1, N2, N4 should pay special attention to the study of risks, adjustment of existing and implementation of new measures to ensure personnel security of the enterprise. Also noteworthy is the negative contribution to the change of economic security management of enterprises operation of innovation and technological subsystem, which, in turn, requires a review of innovation policy of enterprises N1, N4 and the implementation of new measures to improve the efficiency of this subsystem. At the same time, the enterprise N4 must also pay attention to the development of measures for the financial security of the enterprise.

Accordingly, the implementation of a comprehensive assessment of economic security of the enterprise using factor analysis allows to assess the degree of influence of each factor-subsystem that is part of the economic security management of the enterprise, and allows to adequately adjust existing measures to ensure targeted level of economic security management.

4. Conclusions

- Assessment of the current level is a key component of the economic security management system of the enterprise. As a result, choosing methodological assessment approach, which is the most appropriate to the goals of the enterprise, is a very important task. This technique makes it possible to take into account the fact that economic security management is a multidimensional phenomenon that is influenced by a large number of factors.
- Proposed approach, which is based on the use of an integral indicator, factor analysis, the method of chain substitutions, allows taking into account the specifics of the enterprise, identifying risks effectively, developing and implementing measures to eliminate them. The advantages of this method are its versatility, the ability to generate information based on available data, the ability to generate a comprehensive assessment of all selected subsystems, which allows us to draw conclusions about the level of the enterprise economic security management. The approach is based on the use of functional decomposition of the components of the economic security management system, namely: operational, financial, personnel and also innovation and technological subsystems.
- Prospect of further research in this area is the

formation of a set of indicators that best characterize the selected subsystems. Taking them into account will increase the efficiency and increase the adaptability of the economic security system of the enterprise.

5. References

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