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DEVELOPMENT OF GAS TRANSPORTATION COMPANIES' ECONOMIC SECURITY LEVEL EVALUATION METHOD BY TAXONOMETRIC METHOD

Проведено дослідження теоретико-методологічних засад оцінки економічної безпеки газотранспортних підприємств. Отримано інтегральний показник рівня економічної безпеки газотранспортного підприємства, який забезпечує можливість отримання якомога точніших даних про стан економічної безпеки, а також про індекси вагомості складових діяльності газотранспортного підприємства. Запропонована у роботі методика дозволяє розробити ефективну модель управління підприємством, яка забезпечує стабільний розвиток і уникнення несприятливих факторів чи загроз.

Ключові слова: *метод варіацій, економічна безпека газотранспортних підприємств, рівні розвитку, алгоритм оцінки.*

1. Introduction

In the current state of the economy, the problem of determining the methodology for an integrated assessment of the level of economic security of enterprises in various sectors of the economy has recently become particularly relevant. The reason for this is both the transformational phenomena in the economy, and the unstable economic situation both in Ukraine and in the world. And when it comes to the gas transport industry, economic security becomes the founder of the welfare and economic stability of the enterprise, industry, and the country.

However, despite the great interest of scientists in solving this problem, it should be noted that most of the scientific developments are devoted to the state or regional level, whereas the question of assessing the economic security of enterprises in a particular industry has not been paid attention. Although now there are discussions on certain components of the economic security of the enterprise in the spectrum of functional components and the composition of the evaluation criteria of the components of the economic security of the state.

2. The object of research and its technological audit

The economic security of the enterprise is a complex multifactor indicator that not only determines the degree of protection before threats, but also shows the level of development of the enterprise. However, for its definition, often used techniques that are not able to fully reflect the state of the enterprise and simultaneously take into account the industry characteristics. And since the gas transportation industry is strategic in the structure of the country's economic security, the assessment of the state of economic security acquires prospects. That is why *the object of research* is the process of assessing the state of ensuring the economic security of gas transport enterprises.

The subject of research is a set of theoretical, methodological and practical tools for assessing the state of ensuring economic security of gas transport enterprises.

3. The aim and objectives of research

The aim of research is development of theoretical and methodological provisions for assessing the level of economic security of gas transport enterprises using the taxonometric method and the integral criterion.

To achieve this aim, the following tasks are defined:

1. To systematize the theoretical and methodological approaches to the definition and maintenance of an appropriate level of economic security with the identification of industry-specific features of economic security in gas transportation enterprises.

2. To identify the sectoral features of the gas transport industry and the technical and economic indicators, they are determined.

4. Research of existing solutions of the problem

Modern methods of assessing the level of economic security are presented in the works of many scientists. Thus, analyzing the works [1, 2] it is possible to see that the authors are supporters of the resource-functional approach, the main disadvantage of which is that the level of economic security with this approach can only be determined by comparing with the same levels for several periods, that is, in dynamics. In contrast, the scientists [3–6] consider the main program-target approach, the advantage of which is the forecasting and taking into account the risks of the external and internal environment, the disadvantages are difficulties in establishing the coefficients of significance on the basis of expert assessment methods. Scientists [7, 8] consider the method of economic and mathematical modeling as key in determining economic security. However, its main disadvantage is the complexity of forming a system of evaluation

indicators and inaccuracy of the calculation algorithm, which is associated with the uncertainty of the types of local functions. However, the authors of [9, 10] are supporters of the «accounting approach», which provides for the use of criteria, are calculated on the basis of information of accounting and management accounting. The main drawback of this approach is the process of identifying and measuring the necessary data, which is characterized by complexity, duration and requires the processing of large amounts of information. Based on the literature analysis, let's conclude that there is a need to develop a methodology that takes into account the shortcomings of the above methods, as well as the characteristics of gas transportation enterprises.

5. Methods of research

To solve the problems, the following methods were used: analysis and synthesis, logical generalization, analogies, comparative comparisons, monographic and graphoanalytical methods.

6. Research results

To develop a methodology for assessing the level of economic security of gas transport enterprises, let's use a modern conceptual approach adapted to the specifics of the gas transportation industry. From Fig. 1 it can be seen that the proposed algorithm has seven stages and makes it possible to comprehensively assess the economic security of gas transport enterprises with the help of a complex indicator.

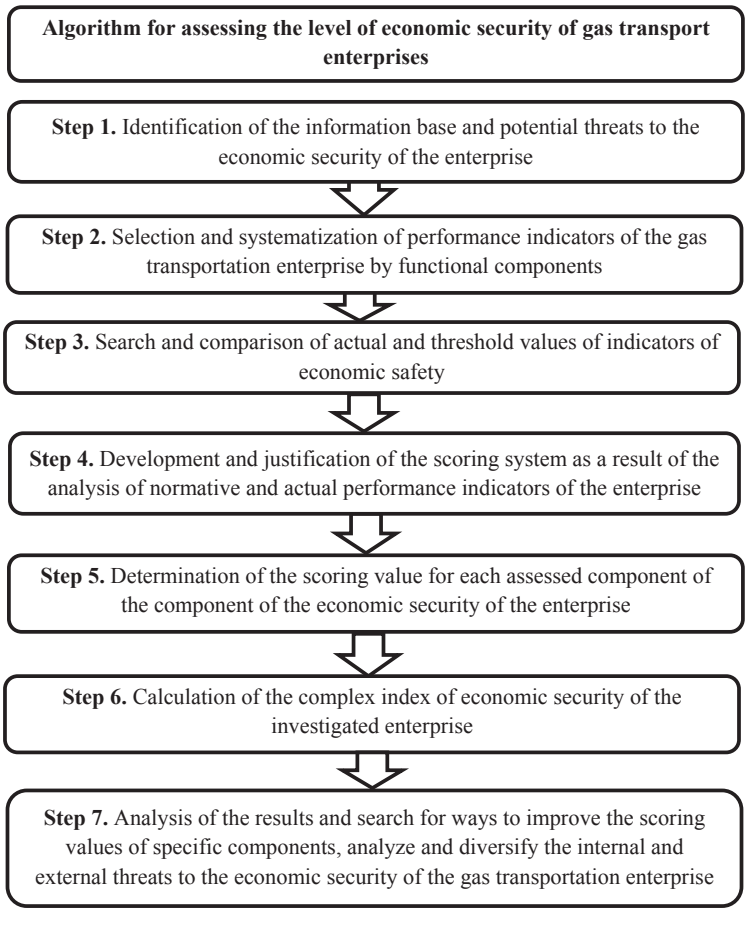

Fig. 1. Algorithm for assessing the economic security of gas transport enterprises

At the first step, the information base for the research is determined, that is, statistical and analytical data are collected for the calculations. At the second step, among indicators that characterize the economic activity of an enterprise, indicators are identified that relate to economic security, as well as the procedure for calculating them. These indicators are systematized according to the functional components of the economic security of the enterprise. At the third step, the enterprise is analyzed and those components having a direct impact on the state of economic security of the enterprise are determined. At the fourth step, based on the components, indicators are formed for each of the selected components. At the fifth step, the definition and analysis of the indicators included in each component is carried out. At the sixth step, the weight value of each component is determined using the variation method. The variation index is calculated and applied to determine the weight coefficients according to formulas (1)–(4).

$$W_k = \frac{V_k}{\sum_{k=1}^{n} V_k}, \quad (1)$$

$$\bar{x}_k = \frac{1}{w}\sum_{i=1}^{w} x_{ik}, \quad (2)$$

$$\mathrm{V}_k = \frac{S_k}{\bar{x}_k}, \quad (3)$$

$$S_k = \left[\frac{1}{w-1}\sum_{i=1}^{w}\left(x_{ik} - \bar{x}_k\right)^{\frac{1}{2}}\right], \quad (4)$$

where W_k – the weighting factor (hierarchy); x_k – the average value of the k-th ($k=1, 2, ..., n$) indicator signs; x_{ik} – the value of the k-th sign (indicator) for the i-th object; S_k – the standard deviation of the signs of k. Further use of the obtained weight coefficients is their multiplication by the standardized value of the k-th attribute of the i-th object of the study:

$$Z^*_{ik} = \frac{x_{ik} - \bar{x}_k}{S_k} \cdot W_k, \quad (5)$$

where Z^*_{ik} – the standardized value of the k-th attribute for the i-th object, corrected for the weighting factor.

At the seventh step, taxonometric analysis is performed to determine the integral index. The taxonometric method (the method of Euclidean distances) is based on the choice of the standard, in this case – the «reference configuration». Next, let's compare the optimal parameters (coordinates) of its vector with the corresponding parameters of the vectors of other possible configurations. That is, there are Euclidean distances, along which the possible cluster structures are ranked: the smallest distance corresponds to the highest place.

The principle of this technique is presentation of all the data on the desired benefits from participation in a cluster in the form of a matrix, where a single line is a benefit vector of the configuration variant, which coordinates are the same values of the aggregate results.

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At the end, a detailed analysis of the results and providing recommendations for ensuring the proper level of economic security of the enterprise:

1) systematization of problems of the enterprise;

2) determining the strategy for further development of the enterprise;

3) provision of proposals for the application of organizational and economic measures to ensure the economic security of an enterprise, taking into account the impact of European integration factors in an unstable market environment;

4) identify internal and external threats, as well as strategies for avoiding and diversifying the risks of the enterprise;

5) the state of the enterprise's activity is predicted for the next period.

However, let's consider it expedient to distinguish among the total number of the components of the enterprise's activity the following main components, such as financial, power, innovation, political, legal, information, intellectual and environmental, when examining the problems of ensuring the economic security of gas transport enterprises.

Each of the components of the economic security of the enterprise is characterized by its own content, a set of functional criteria and methods of provision. For a more detailed study of each of the components, let's propose the following decomposition of the components into indicators, which will fully reflect the essence of the component and its impact on economic security.

The definition and analysis of the indicators of economic security of the enterprise also has a preventive function, which is prevention of the enterprise from moving in a critical state of economic security, which leads to a general deterioration of the financial condition of the enterprise. These indicators allow timely detection of signs of significant deviations from the normal state of economic security and take timely measures to improve the level of these indicators. It is proposed to assess the level of economic security of a gas transportation enterprise using ten groups of indicators for each of the components of economic security (Table 1).

The next step in assessing economic security is the calculation of the values of the indicators for the investigated enterprise (step 5). And after calculating the weight coefficients by the variation method (step 6). A summary table of the dynamics of the weight indices of the constituent elements of the integral indicator of economic security is given in Table 2.

Dynamics of the importance of the integral index of economic security for 2013–2017 is reflected graphically in Fig. 2.

Table 1

Indicators for assessing the economic security of the company*

Component	Indicators
Financial	*Financial stability and stability*: coefficient of autonomy, coefficient of financial stability, coefficient of financial dependence, coefficient of efficiency of use of assets and coefficient of efficiency of use of own capital
	Solvency and liquidity: Coefficient of coverage, quick liquidity ratio and absolute liquidity ratio
	Profitability: profitability of the products sold, the profitability of the core business, the return on equity, the payback period of equity, the profitability of the total capital of the enterprise
	Business activity: the general turnover of capital, the turnover of mobile assets, the turnover of material current assets, the average period of turnover of receivables, the turnover of accounts payable, the return on assets of fixed assets and other non-current assets, the turnover of equity
Intellectual	Index of inventive (rationalization) activity Index of engineering, technical and scientific support Index of educational level Index of knowledge renovation
Information	Coefficient of information completeness Coefficient of information accuracy Coefficient of information inconsistency
Environmental	Level of pollutants at the enterprise standards Safety of vital functions Working conditions in the enterprise Load on the environment
Power	Counteraction to raiding Safety of personnel Safety of leadership Safety of premises and buildings
Political and legal	Coefficient of payment discipline Level of quality of legal services Coefficient of legal management
Innovative	Level of safety of innovative products Level of riskiness of innovation activity Level of change in the activity of development of new types of products

Note: * – supplemented and generalized by the author.

Table 2

Dynamics of changes in the indicators of the significance of categories (components of economic security) for a typical gas transportation enterprise for 2013–2017

The component of the integral indicator of economic security	$W_{k\ 2013}$	$W_{k\ 2014}$	$W_{k\ 2015}$	$W_{k\ 2016}$	$W_{k\ 2017}$
Financial stability	0.14	0.14	0.14	0.13	0.13
Liquidity and solvency	0.13	0.13	0.14	0.13	0.14
Profitability of the enterprise	0.12	0.13	0.11	0.13	0.13
Business activity	0.13	0.12	0.13	0.14	0.11
Intellectual component	0.06	0.05	0.05	0.06	0.05
Information component	0.03	0.05	0.04	0.04	0.04
Safety of the enterprise in the environmental sphere	0.04	0.04	0.04	0.02	0.03
Power safety of the enterprise	0.15	0.15	0.15	0.16	0.16
Political and legal security of the enterprise	0.05	0.05	0.05	0.04	0.06
Innovative security of the enterprise	0.15	0.14	0.15	0.15	0.15

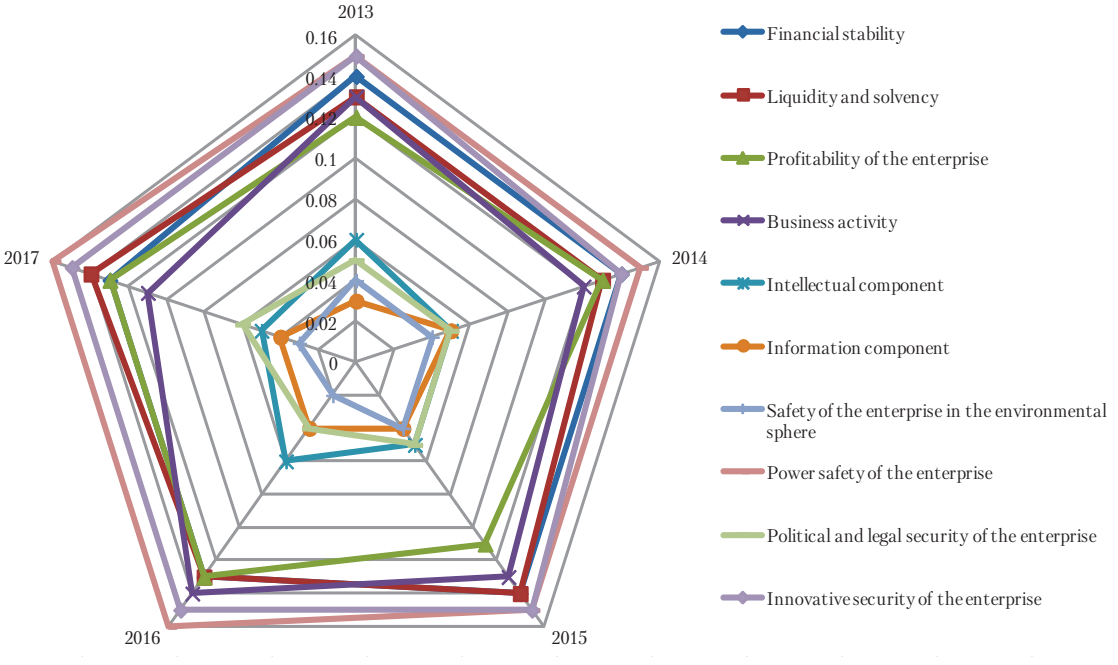

Fig. 2. The weight of the components of the integral indicator of economic security of a typical gas transportation enterprise for 2013–2017

For further calculation of the integral indicator of economic security of a typical gas transportation enterprise, it is necessary to take into account the significance of the components making correction by the method of weighted average whole. The results of the calculations are given in Table 3.

Table 3

The standardized value of the components of economic security of a typical gas transportation enterprise adjusted for the weighting coefficient for 2013–2017

The component of the integral indicator of economic security	$Z_{k\ 2013}$	$Z_{k\ 2014}$	$Z_{k\ 2015}$	$Z_{k\ 2016}$	$Z_{k\ 2017}$
Financial stability	0.99	1.20	1.32	1.41	1.53
Liquidity and solvency	0.30	0.35	0.38	0.37	0.42
Profitability of the enterprise	0.43	0.48	0.39	0.45	0.46
Business activity	5.66	5.99	7.02	8.23	4.99
Intellectual component	0.084	0.08	0.08	0.11	0.11
Information component	0.036	0.07	0.06	0.07	0.08
Safety of the enterprise in the environmental sphere	0.06	0.06	0.06	0.04	0.05
Power safety of the enterprise	0.099	0.10	0.18	0.20	0.20
Political and legal security of the enterprise	0.045	0.05	0.06	0.05	0.08
Innovative security of the enterprise	0.15	0.16	0.20	0.20	0.21

Assessment of the financial condition of the enterprise using taxonometric analysis (step 7) makes it possible to monitor the activities of the gas transportation enterprise and determine the integral index of economic security. The proposed method makes it possible to obtain sufficiently complete and objective information about this state and dynamics of this indicator for the period under review [4]. Using the data of Table 3, let's form the observation matrix (Table 4).

Table 4

Matrix of observations X integral index of economic security of a typical gas transportation enterprise for 2013–2017

X	0.99	0.30	0.43	5.66	0.08	0.04	0.06	0.10	0.05	0.15
	1.20	0.35	0.48	5.99	0.08	0.07	0.06	0.10	0.05	0.16
	1.32	0.38	0.39	7.02	0.08	0.06	0.06	0.18	0.06	0.20
	1.41	0.37	0.45	8.23	0.11	0.07	0.04	0.20	0.05	0.20
	1.53	0.42	0.46	4.99	0.11	0.08	0.05	0.20	0.08	0.21

As some indicators are reflected in relative, and some in absolute values, standardization is necessary for unification and possibilities of further calculations. That is, it is necessary to bring the various units of measurement to a dimensionless value [5].

To do this, let's determine the average value for each metric and serialize it using the formula:

$$F_{ij} = \frac{X_{ij}}{\overline{X}_i}. \quad (6)$$

The results of the mean value and serialization calculations are given in Tables 5, 6 respectively.

Table 5

The results of calculating the average value of each of the indicators (components) of the integral indicator of economic security of a typical gas transportation enterprise for 2013–2017

$\overline{X}_1$	$\overline{X}_2$	$\overline{X}_3$	$\overline{X}_4$	$\overline{X}_5$	$\overline{X}_6$	$\overline{X}_7$	$\overline{X}_8$	$\overline{X}_9$	$\overline{X}_{10}$
1.29	0.36	0.44	6.38	0.09	0.06	0.05	0.16	0.06	0.18

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Table 6

The matrix of standardized values F of each of the signs (components) of the integral indicator of economic security of a typical gas transportation enterprise for 2013–2017

F	0.77	0.82	0.97	0.89	0.87	0.63	1.11	0.64	0.86	0.82
	0.93	0.96	1.09	0.94	0.87	1.09	1.11	0.64	0.86	0.87
	1.02	1.04	0.88	1.10	0.87	0.94	1.11	1.15	1.03	1.09
	1.09	1.02	1.02	1.29	1.20	1.09	0.74	1.28	0.86	1.09
	1.19	1.15	1.04	0.78	1.20	1.25	0.93	1.28	1.38	1.14

After the standardization of the values, the differentiation of symptoms to stimulants and depressants is carried out. The basis for this division is the characteristic influence of each of the indicators on the level of development of the investigated object. Signs that have a positive (stimulating) effect on the overall level of development of the object are called stimulants, and signs that slow the development of the enterprise are depressants. Separation of the sign into stimulants and depressants is the basis for constructing a reference vector that has the coordinates of X_{oi} and is formed from the values of the indices:

– $F_{oi} = \max F_{ij}$, if the j is a stimulant,
– $F_{oi} = \min F_{ij}$, if the exponent j is a depressant.

After the distribution of the signs for stimulants and depressants based on the elements of the matrix, let's form the reference vector (P_o):

$$P_o = (1{,}19;1{,}15;1{,}09;1{,}29;1{,}2;1{,}25;1{,}11;1{,}28;1{,}38;1{,}14).$$

The distance between the point-unit and the point P_o is calculated by the formula:

$$C_{io} = \sqrt{\sum_{j=1}^{m} \left(F_{ij} - F_{oj}\right)^2}, \quad (7)$$

where F_{ij} – the standardized value of the j-indicator in the time period i; F_{oj} – the standardized value of the i-indicator in the reference.

The calculated value of the indicator for investigated years (2013–2017), as well as the average value, is given in Table 7.

Table 7

The values of indicators C_{io} and $\bar{C}_o$ of integral index of economic security of a typical gas transportation enterprise for 2013–2017

$C_{i\,2013}$	$C_{i\,2014}$	$C_{i\,2015}$	$C_{i\,2016}$	$C_{i\,2017}$	$\bar{C}_o$
1.14	1.05	0.67	0.68	0.54	0.85

The distance obtained serves as the initial element for calculating the taxonomy index by the following formulas:

$$K_i = 1 - d_i, \quad (8)$$

$$d_i = \frac{C_{io}}{C_o}, \quad (9)$$

$$C_o = \bar{C}_o + 2S_o, \quad (10)$$

$$S_o = \sqrt{\frac{1}{m}\sum_{i=1}^{m}\left(C_{io} - \bar{C}_o\right)^2}. \quad (11)$$

Since the indicators are interrelated, the calculations should begin with the indicator S_o and C_o for all the investigated years, and further indicators d_i and K_i should be calculated for each investigated year separately (2013–2017). Data of calculations are resulted in Table 8.

Table 8

The results of calculation of indicators S_o, C_o, d_i, K_i of integral index of economic security of a typical gas transportation enterprise for 2013–2017

Indicator/year	2013	2014	2015	2016	2017
S_o	0.29				
C_o	1.43				
d_i	0.80	0.74	0.47	0.48	0.38
K_i	0.20	0.26	0.53	0.52	0.62

Dynamics of the integral indicator of economic security of a typical gas transportation enterprise for 2013–2017 is reflected graphically in Fig. 3.

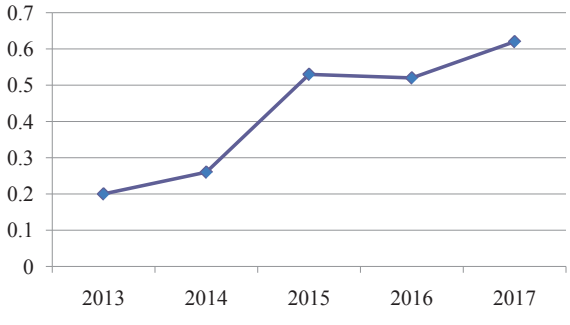

Fig. 3. Dynamics of the integral indicator of economic security of a typical gas transportation enterprise for 2013–2017

The taxonometric method synthetically characterizes the changes in the values of the characteristics of the investigated groups. Interpretation of this indicator is as follows: it takes high values for large values of stimulants and low values for small values of stimulants. The gradation of the level of development of objects relative to the investigated phenomenon is reflected in Table 9.

Table 9

Graduation of the level of the integral indicator of economic security of a typical gas transportation enterprise for 2013–2017

Level of development	The value of the taxonomic indicator
Highest	1.00–0.80
High	0.79–0.60
Average	0.59–0.26
Low	0.25–0.11
Lowest	0.10–0.01

The growth dynamics of the integral index of economic security of a typical gas transportation enterprise as one of the representatives of the Ukrainian gas transportation industry shows that this indicator has increased over the past 5 years. This is due to a balanced policy and clear management decisions both at the enterprise level and at the state level.

Continuation of the trend towards an increase in the integral index of economic security of a typical gas transportation enterprise will allow the enterprise to show growth even under adverse economic conditions or crises. Thus, ensuring its economic security, a typical association directly contributes to the economic security of the energy industry, and to the economic security of the state as a whole.

Analyzing the indicator of economic security for the perspective of the graduation of the levels of this indicator, wit is possible to note that at the beginning of the analyzed period (2013) this indicator was in the low segment (value of 0.2), what caused the threat to the enterprise. But the leadership took the necessary measures to improve economic security and, as a result, next year the figure was already 0.26, which is an increase of 30 % compared to 2013

In 2016, the enterprise showed a slight decline in economic security (by 1.9 %), which is caused by a general decline in the energy sector. However, as early as in 2017, the company's management focused additional attention on the innovative and power component as one of the important components of economic security. This allowed not only to introduce into the activity new modern innovative means that allowed to improve the financial result of the enterprise's activity, but also to protect from forced takeover or raider seizure. The overall growth of the integral indicator of economic security of a typical gas transportation enterprise in comparison with the previous year was 19.2 %. This confirms that the enterprise is at a «high» level of economic security and is able to independently resist unfavorable economic phenomena and to introduce innovative mechanisms in its activities. By this, increasing profitability of activities and decreasing non-ecological processes, and introducing modern innovative measures.

7. SWOT analysis of research results

Strengths. The strength of research is the identification of features of economic security assessment for enterprises of the gas transportation industry.

Weaknesses. The weak side is that the performance indicators often do not reflect the real state of affairs in the enterprise, and the measures sometimes do not give the expected result due to the politicized leadership of the association.

Opportunities. Opportunities for further research are borrowing the experience of foreign countries to improve the analysis of management decisions and diversify threats to economic security in the enterprise, industry, country. The introduction of this methodology will bring to the company increase in the profitability of activities, decrease in the probability of bankruptcy, diversifies threats from the seizure and will allow the enterprise to work stably and harmoniously.

Threats. Threats to the results of the conducted research are that the market of gas transportation services is a strategic one in the structure of the Ukrainian economy and often political decisions have a negative impact on this sector. As well as one of the threats, it is possible to determine the risk of forced takeover or raider seizure because of the lack of a legislative basis for counteraction and the absence of a policy of counteracting raiders at the enterprise.

Introduction and support of all proposed components of the enterprise understand the significant costs, therefore, when choosing a strategy for ensuring economic security, it is also necessary to take into account the current situation in the enterprise and begin to change with the most priority components.

8. Conclusions

1. During the research, resource-functional, program-target, economic-mathematical, accounting and other approaches to determining the level of economic security are analyzed and systematized. The advantages and disadvantages of each method are also determined and, based on them, theoretical and methodological approaches to determining and ensuring the level of economic security based on industry specific features of economic security in gas transport enterprises are formed.

2. The economic-mathematical apparatus is analyzed and the expediency of using the taxonometric approach to assessing the level of economic security is exemplified by the example of gas transport enterprises. The taxonometric method synthetically characterizes the changes in the values of the characteristics of the investigated groups. Interpretation of this indicator is as follows: it takes high values for large values of stimulants and low values for small values of stimulants.

The growth dynamics of the integral index of economic security of a typical gas transportation enterprise as one of the representatives of the Ukrainian gas transportation industry shows that this indicator has increased over the past 5 years. This is due to a balanced policy and clear management decisions both at the enterprise level and at the state level.

Continuation of the trend towards an increase in the integral index of economic security of a typical gas transportation enterprise will allow the enterprise to show growth even under adverse economic conditions or crises. Thus, ensuring its economic security, a typical association directly contributes to the economic security of the energy industry, and to the economic security of the state as a whole.

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РАЗРАБОТКА МЕТОДИКИ ОЦЕНКИ УРОВНЯ ЭКОНОМИЧЕСКОЙ БЕЗОПАСНОСТИ ГАЗОТРАНСПОРТНОГО ПРЕДПРИЯТИЯ С ПОМОЩЬЮ ТАКСОНОМЕТРИЧЕСКОГО МЕТОДА

Проведено исследование теоретико-методологических основ оценки экономической безопасности газотранспортных предприятий. Получен интегральный показатель уровня экономической безопасности газотранспортного предприятия, который обеспечивает возможность получения как можно более точных данных о состоянии экономической безопасности, а также о индексе значимости составляющих деятельности газотранспортного предприятия. Предложенная в работе методика позволяет разработать эффективную модель управления предприятием, которая обеспечивает стабильное развитие и избежание неблагоприятных факторов или угроз.

Ключевые слова: метод вариаций, экономическая безопасность газотранспортных предприятий, уровни развития, алгоритм оценки.

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FORMATION OF SYSTEM FRAMEWORKS OF ENERGY CONTROLLING

Проаналізовано можливості застосування концепції контролінгу в енергетичній сфері підприємства та розглянуті науково-практичні положення її нового напрямку – енергетичного контролінгу, як мультіфункціональної системи, що управляє кількісними параметрами енергоефективності. На засадах системного аналізу було побудовано системний контур енергетичного контролінгу, який окреслює міжфункціональні зв'язки та сфери його взаємодії з управлінськими системами підприємства.

Ключові слова: *енергетичний контролінг, енергетичний менеджмент, енергетична ефективність, системний контур.*

1. Introduction

Energy efficiency as far as energy saving and energy security are modern challenges not only in Ukraine, but also in most countries that do not possess significant natural hydrocarbon reserves. But in Ukraine this challenge is close to be a big problem because of energy-intensive industrial production and a low level of energy saving among the population.

Therefore, the scientific and practical interest in the field of effective energy resources management is becoming more and more extensive. However, Ukrainian economists as a rule associate the energy management mostly with organizational and technical support of energy equipment use.

Nevertheless all over the world as commercial companies, so regional and national decision makers look for new approaches to enhance energy efficiency, guarantee energy security and improve other energy related issues. This practical need led to one more direction in development of controlling concept called energy controlling. Using the base controlling principals – transparency, reliability, optimality, and consistency – energy controlling is called to build up the system for efficient management of energy resources. That's why it's timely to research system frameworks of energy controlling.

2. The object of research and its technological audit

The object of research is the controlling concept and its application in the energy sector of the enterprise.

To conduct an objective study of economic levers for increasing the energy efficiency in industrial enterprises, world ratings of energy-efficient economies were analyzed. According to surveys made by the non-profit organization the American Council for an Energy-Efficient Economy (ACEEE), Germany firmly holds the leading position on energy efficiency among the world's largest energy-consuming economies during last years [1]. Therefore, German business models in this area deserve special attention.

The German researchers consider energy controlling to be the most promising direction for improving the energy efficiency, energy saving and energy security of an industrial enterprise [2–6]. Basing on the conceptual and instrumental basis of controlling and realizing its functions in the energy sector, energy controlling transforms the traditional understanding of the «controlling system». As a result, there are specific technical and economic approaches to solve management problems, expand the tools of controlling.

One of the most challenging areas in modern Ukraine is insufficient levels of transparency, reliability, optimality,

