APPROACHES TO DETERMINE THE ECONOMIC SECURITY LEVEL OF ENTERPRISES

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Abstract The article reviews some of the existing classifications of methodologies for economic security evaluation. It examines the most widely spread scientific approaches used to measure the overall level of economic security: the indicator or threshold, resource-functional program-target or complex, an institutional approach based on the theory of economic risks, rapid techniques. The work also provides a wide range of supporters of each of the techniques. The article offers a detailed description of the procedure while applying each methodological approach. It provides mathematical formulas for quantifying economic security within the considered approaches and a new systematization of all the advantages and disadvantages of a given scientific approach to measuring the level of economic security. As a result, we propose to use the synthesis of all existing approaches – the so-called generalized approach – to better assess the overall level of economic security.

Key words: *economic security, technique, scientific approach, the functional components of the economic security indicators, the criterion of economic security, the integral measure of economic security.*

Statement of the problem

Today, much attention is paid to the evaluation of economic security on the macroeconomic (state or regions) level. However, to determine the economic security at the micro level there is a considerable lack of sufficient in-depth research and instead of a single comprehensive and easy-to-use technique there are widely differentiating scientific approaches. In this case there are issues such as:

- The lack of certainty with a specific list of components of the economic security of an enterprise;
- Difficulties in the composition of the evaluation criteria for the components of economic security determination, and their graduation for all possible levels of economic security;
- Lack of public Ukrainian methodologies for assessing enterprise security components level and general economic security including all its components, as the approaches that have been recognized in the foreign practice cannot always be applied in terms of Ukrainian economy [1, p. 12].

All of these issues need scientific understanding to identify ways of their rational solution. And the development of a comprehensive methodology to assess the economic security entities is critical.

Analysis of recent research and publications

Today there are many studies about how to evaluate the level of economic security. Among scientists who have dedicated their work to specific problems, we should note the following: Arefyeva E., Baranowski A., Bendykov M., Vasyltsiv T., Hichova N., Dovbnya S., Evdokimov F., Yermolaev P., Ignatiev I., Illarionov A., Illyashenko S., Kovalev D., Kostanetskyy V., Kotenko N., Krakos J., Oleynikov E., Oleksyuk O., Plyetnikova I., Pokropyvnyy S., Popovich P., Reverchuk N., Serik N., Sukhorukov T., Tambovtsev V., Fedorov N., Shvydanenko G., Shpankovska N., Shtovba S. However, despite the large number of national scientists' and practitioners' works, we still don't have a universal effective scientific approach to measure the level of economic security, and the existing methods have many significant disadvantages.

Formulation of the problem

The aim and objective is to study the existing methodological approaches to assess the general level of economic security, the consideration of leading national researchers' opinions on these problems, analysis and systematization of the main advantages and disadvantages of the approaches used, and formulation of original author's proposals.

Results

In the literature, we can see the following classification of the most shared methodological approaches to economic security level determination: indicator approach, resource-functional, target-oriented and comprehensive approach, based on the economic risks theory. Express method is also widely spread.

Indicator approach involves assessing the level of economic security as pairing the real company performance with certain indicators – performance thresholds. As a result of this comparison, we can determine the status of economic security: safe or unsafe, crisis, critical, pre-crisis or normal [2, p. 99 –100].

Representatives of indicator approach are: Kovalev D., Sukhorukova T., Illarionov A., Tambovtsev V., Baranowski O., Bendykov M., Ignatiev I., Shpankovska N., Kostanetskyy V., Kotenko N. and others [3; 4]. Thus, D. Kovalev and T. Sukhorukova offer to use the follow indicators to determine the level of economic security and major functional components:

1) Technological pillar: the degree of fixed assets amortization, loading specialized equipment, access to know-how, the share of funds spent on research and development, launch of fixed assets performance, researchers' average monthly salary;
2) Resource component: security principal types of production resources, ratio of coverage and **costs to own sources**, the possibility of substitution of resources and quality of resources;
3) Financial component: the index of industrial output, income dynamics, the amount of debts, market share, the share of public investment in GDP, profitability, capital vestments, long-term loans;
4) The social component: the minimum wages, the average wages, numbers of workers whose income is below the living wage, the part of wages in price, the money spend on food by employee's family, the rate of staff turnover, number of working hours per week [5, p. 51 – 52].

Resource-functional approach is when the level of economic security is measured by determining the efficiency of enterprises resources. That means that the assessment of economic security is essentially an analysis of the financial state and economic activity of enterprises. This analysis is mainly carried out by the functional components of economic security. The general economic security levels must be compared in the dynamics [2, p. 99 – 100]. This approach is realized in the

works of such scientists as Oleynikov E., Pokropyvnyy S., Illyashenko S., Arefyeva E., Popovic P., Reverchuk N., Shtovba S., Shvydanenko G. and Oleksyuk A. [3; 4].

Professor S. Illyashenko offers the following methodology for economic security level calculation:

1) Transfer of performance levels of each component of the economic security to the relative evaluation according to the following formula:

$$O_i = \frac{1}{N_i} * n_i,$$

where O_i – relative score of i-th component of economic security;

N_i – number of levels of i-th component of economic security;

n_i – number of security i-th component, starting from the most adverse included;

2) Determine the weight of each component Bi economic security;

3) Calculate the integrated assessment of economic security as a weighted average of the components. The level of economic security increases when the integrated assessment approaches 1, and rating below 0.5 indicates economic security weakening [1, p. 18].

Taking into consideration the data on the proportion of the functional significance of the components of economic security such researchers as G. Shvydanenko and A. Oleksyuk derived a formula to calculate the overall index of economic security of industrial enterprises:

$$G = 0{,}2 * F_{F.C} + 0{,}15 * F_{T-T.C} + 0{,}2 * F_{I-HR.C} + 0{,}2 * F_{INF.C} + 0{,}05 * F_{ENV.C} +$$

$$+ 0{,}1 * F_{P-L.C} + 0{,}1 * F_{LE.C},$$

where $F_{F.C}$ – evaluation of financial component;

$F_{T-T.C}$ – evaluation of technical and technological component;

$F_{I-HR.C}$ – assessment of intellectual and human resource components;

$F_{INF.C}$ – evaluation of information component;

$F_{ENV.C}$ – assessment of the environmental component;

$F_{P-L.C}$ – assessment of the political and legal component;

$F_{LE.C}$ – evaluation of the law enforcement component of economic security [6, p. 165 – 166].

S. Pokropyvnyy notes that the combined criterion of economic security can be defined as follows:

$$k_{seb} = \sum_{i=1}^{n} k_i * d_i,$$

where k_{seb} – combined criterion of economic security;

k_i – the value of individual criteria for the i-th functional component;

d_i – share of the importance of the i-th functional component;

n – number of elements of economic security.

It is considered that the industrial share of the functional significance of the economic security components include: financial, intellectual and human resources, technical and technological components – 0.2; Information – 0.15; political, legal and environmental – 0.1; enforcement – 0.05 [7, p. 469]. So, as you can see, the views of three latter scholars on the proportion of the value of individual economic security components differ. In our view, it is more appropriate to determine the

proportion of the functional significance of the economic security components guided by the specific activity of the investigated companies, the scope of their activities, and to set these parameters individually for industrial, agricultural, trade and financial sector [8, p. 28].

As for the value of individual criteria, it is advisable to calculate the ratio of the possible losses of the enterprise and the cost of measures related to their prevention:

$$R_i = \frac{SZ_i}{Z_i}$$

where SZ_i – total loss according to the i-th functional component of economic security, hrn;

Z_i – total cost of the measures to prevent the loss for the i-th functional component of economic security, hrn.

The proposed criterion can be used only in case of quantitative estimates of losses associated with exposure to threats, and the magnitude of expenditure required to address them. According to T. Vasyltsiv, this method has disadvantages associated with unknown distribution of priorities in functional components of economic security for the various entities, and specific aspect of the industry, as well as the absence of grade scale of total and partial criteria [9 , p. 47].

P. Yermolaev (within resource-functional approach) offers functional profile method, based on calculating 28 indicators on the main components of economic security. Thus, for each indicator he sets a level of economic danger on a scale from 1 to 9. The author identifies four levels of economic danger, depending on the number of assigned points and notes that the level of economic danger is calculated monthly based on a particular scale of negative dynamics [8].

When using a software-based approach we carry out integration of indicators characterizing the level of economic security. The emphasis is on the selection of indicators and methods for determining their integration [2, p. 99 – 100]. Representatives of this approach are Evdokimov F., Dovbnya S., Hichova N., Fedorov N., Kovalev D. and Plyetnikova I. [3; 4].

In works by D. Kovalev and I. Plyetnikova it is recommended to represent the level of economic security as a function of several variables, namely as follows:

$$Y_{eks} = F(X_i) = a_1 f(x_1) + a_2 f(x_2) + \cdots + a_i f(x_n)$$

where $x_1, x_2, ..., x_n$ – key performance indicators;

f (x_1), f (x_2), ..., f (x_n) – local functions of the level of economic security dependence on relevant performance indicators;

$a_1, a_2, ..., a_i$ – the proportion of the importance of each indicator for economic security, which is determined in proportion to the average percentage of increase in the corresponding function $f(x_i)$, by changing the argument x_1 1% [10, p. 35 – 37].

In general, resource-functional and target-oriented approaches seem basically similar – they provide estimates for individual components of economic security. Very often these two approaches are combined while measuring the level of economic security.

Using approach based on the economic risks theory we determine all possible threats to the enterprise level and calculate the potential loss that is compared with the value of profits, income and property. The mentioned approach is narrower than other approaches [2, p. 99 – 100].

As each of these approaches has certain advantages and disadvantages, it is reasonable to combine most of methods and create a single generalized technique, which takes into account the individual elements of all existing scientific approaches. An example would be the position of G. Shvydanenko and A. Oleksyuk who offer – as integrated assessment of economic security – to use a technique based on the traditional indicators usage, the pace of their change and the possibility of specific risks realization. Scientists recommend following these stages in assessing:

1) Determine the required performance level for each component of economic security (for example, financial component can be described as a system of indicators of financial stability);

2) Define targets generated in the previous step for the current period and determine their speed of change (the choice of indicators is carried out by management based on corporate strategy development);

3) Formulate the spectrum of possible threats to each component;

4) Determine the benchmark index for each indicator, the ratio of the actual value of each indicator with its regulations (industry average) value of each component in terms of economic security;

5) Determine the level of each component of economic security:

$$F_{E.S}^{C} = \sum_{i=1}^{n} (I_i * t_i * q_i) * (1 - p_i),$$

where I_i – benchmark index for each indicator;

t_i – the rate of change (of at least three years);

q_i – weight coefficient of each indicator in each component of the evaluation system, which is based on strategic targets;

p_i – the total probability of realization of the risk component;

n – number of indicators used to evaluate each component of economic security;

6) Determine the integral index of economic security [6, p. 165].

The general indicator of economic security must meet the following criteria: clearly fixed boundaries; comparability of different time assessments of the economic security of one company and various industries; simplicity and availability of methods of calculation based on the credentials of its universality [10, p. 35].

Some classifications include another – institutional – approach to identify the level of economic security. It takes into account the number of competing companies in the market. As the level of competition increases, the level of economic security of the entity is reduced [8].

Supporters of rapid methods for determining the level of economic security are Krakos J., Serik N., Evdokimov F. The latter proposes to assess the current level of economic security by means of score evaluations and overall rating. Thus, the key indicators of economic security can be grouped in the following areas: financial security, security of work relations, work safety and security markets. It is recommended to evaluate each indicator based on whether it is stimulant or disincentive for the operation of the enterprise. The resulting key values must be compared with some normative data [11, p. 105].

We performed a comparative analysis of the main existing research approaches used to determine the overall level of economic security, and the results of the analysis are summarized in Table 1 [2, p. 99 – 104; 9, p. 47 – 48; 11].

Table 1 – Advantages and disadvantages of approaches to determine the economic security level of enterprises

Name of the scientific approach (methodology)	Advantages	Disadvantages
indicated (threshold) approach	1. Allows using a large number of indicators which allows in-depth analysis of economic security. 2. Offers broad classification of possible economic security levels.	*1. High probability of errors in determining the state of economic security with uncertainty about indicators*
Resource-functional approach	1. A large number of recommendations on criteria of economic security companies and their interpretation 2. Development of a wide range of measures to protect	1. Difficulty of adequate assessment of quality indicators due to lack of statistics for each functional component of economic security, which leads to lack of accurate quantitative expression. 2. Direct Practical ignoring the concept of

	from threats in all areas of the enterprise activity. 3. Highest possibility of practical application.	economic security and equating it with the effective use of all resources of the enterprise. 3. Expert subjectivism in determining the significance of the components of economic security. 4. Lack of rank scale aggregate and individual criteria. 5. Substantial complexity due to the need to compare the values with those for several periods.
Program target (complex) approach	1. Many factors influence the level of economic security. 2. Easy interpretation of assessment results.	*1. Difficulties arise in determining the significance of coefficients on the basis of expert assessments methods* *2. Difficulties in determining system performance.* *3. Difficulties in determining the proportion of the importance of indicators.* *4. Lack of informed choice functions depending on local*
The approach based on theory of economic risks	1. Takes into consideration all possible threats to the enterprise.	1. Narrowness
Institutional approach	1. Individual approach to each company in determining the level of economic security.	1. Significant limitations and ambiguity
Express methods	1. Convenience and ease of use.	1. Ignoring many factors influencing the level of economic security
Generalized method	1. Taking into account all the possible factors influencing the level of economic security.	1. Absence of gradation for values of the integral index 2. Substantial complexity

As we can see from the table, each of the existing scientific approaches has some significant advantages and significant disadvantages, but the largest number of shortcomings are inherent to resource functional and performance-based approaches.

An interesting classification of methodological approaches to determining the level of economic security of enterprises is offered by T. Vasyltsiv. The author divides approaches into traditional and unconventional. Traditional ones include:

1) approaches based on assessment of parameters that characterize all functional areas of the company and protect its assets and resources;
2) approaches based on the analysis of financial stability;
3) approaches using theories and critical recognition of crisis and non-crisis events of the plant;
4) approaches to the use of methods of forecasting bankruptcy.

Unconventional methods include:

1) the ratio of the value of gross investment and the resources needed for investment to support the adequate level of economic security;
2) determining the market value of equity and economic security of the enterprise;
3) assessment of business development, identifying system risk of its development;
4) determining the level of criminalization of the economy;
5) assessment of the risk level of economic activity [9, p. 43].

After assessing the overall level of economic security we can conclude about the current state of economic security and form the basis of a comprehensive analysis of the system providing for economic security.

CONCLUSIONS

So, today there are various methodological approaches to assess the overall level of economic security, the majority of which have significant shortcomings that prevent their use in practice for the quantitative determination of economic security. The most acceptable one seems to be the generalized approach that is based on the basic elements of the main approaches used today. It is expedient further development in this area, which will allow taking into account all possible aspects related to business activity and can affect the level of economic security.

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