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METHODOLOGY FOR ASSESSMENT OF TEXTILE INDUSTRY ENTERPRISES` FINANCIAL SECURITY BASED ON FUZZY LOGIC UNDER UNCERTAINTY

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Abstract. This article describes a methodology for assessing the level of financial security of industrial enterprises. In this article we discuss a fundamental principle of decision-making under uncertainty; the use of expected values to support decision-making is the fundamental principle of decision-making under uncertainty. The scientific novelty of the method lies in the fact that its application makes it possible to assess the financial security of an industrial enterprise not only at a certain point in time, but also to take into account the dynamics of changes in state over a long period, which makes it possible to effectively adjust the business development strategy. The second distinguishing feature of the proposed methodology is its meaningfulness, since the consideration includes all significant key financial indicators of the enterprise.

Keywords: financial security, fuzzy logic, fuzzy knowledge bases, decision making under uncertainty, textile industry, financial performance

Introduction

Financial security problems for enterprises of various types of economic activity are of particular importance. In modern conditions, almost all enterprises and organizations face financial risk, a lack of financial resources, a high level of competition, and the inability to predict the prospects for income and profit. Under these conditions, enterprises should take their financial security especially seriously, avoid overspending, realistically assess financial threats, timely amend financial plans, and form reserves that can prevent a deterioration in their financial situation.

Initially, the concept of "financial security" was considered as part of economic security and was not singled out as an independent element. Therefore, the history of the emergence of the concept of "financial security" can be considered as the history of economic security.

Economic security is usually understood as the most important characteristic of the economic system, which determines its ability to maintain normal living conditions for the population, sustainable provision of resources for the development of the national economy, as well as the consistent implementation of national and state interests (Oleinikova, E., 2005).

Literature review

In scientific publications on economic security, the object of analysis is most often the country's economy as a whole and in its regional context. This led to the main direction of development of the theory of economic security over the past decades - at the upper macrolevel of management, which is confirmed by a number of essentially similar definitions of economic security as a state of the economy and institutions of power, “in which guaranteed protection of national interests, socially oriented development of the country as a whole, sufficient defense potential even under the most unfavorable conditions for the development of internal and external processes ” (Senchagova, V., 2013). The macroeconomic representation of the economic security system began to form later, and the theoretical basis of many studies was made up of classical economic theories, management theories and modern concepts of the development of various sectors of the economy.

Initially, the concept of "economic security of an enterprise" was considered as providing conditions for the preservation of trade secrets and other secrets of the enterprise. It was proposed to solve the problem of economic security in this context based on the premise that the degree of reliability of the entire information security system is determined by the security level of its weakest link, which is considered the organization's personnel. "The economic security of an enterprise (firm) is a state of a given economic entity, in which the vital components of the structure and activities of an enterprise are characterized by a high degree of protection from unwanted changes" (Tursunov B.,et.al., 2020).

Gradually, the definition of the essence of economic security changed, which was due to its more in-depth theoretical understanding. At the moment, the composition of economic security includes a number of components, but practically in each of its concepts the basis is the financial security of a business entity. At the same time, it should be noted that some scientists, when characterizing economic security, actually consider the financial security of an enterprise. For example, Sudakova O.I. defines the economic security of an enterprise as a state in which it can independently, without interference and pressure from outside, determine the ways and forms of

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its economic development. The category of economic security is closely related to the categories of economic stability, stability and independence (Sudakova, O., 2008). Many authors on one of the leading places in the analysis of the economic security of an enterprise raise questions related to its financial activities. This is due to the importance of finance in the life of any business entity. Bogomolov V.A. believes that the main factor in ensuring economic security is the financial balance between profitability, liquidity and risk of an economic entity (Bogomolov and others, V., 2009), ie financial security is the main component that ensures the economic security of an enterprise.

However, a number of both Russian and Ukrainian scholars distinguish financial security as an independent subject, and direct their efforts to its detailed study and analysis. According to K.S.Goryacheva's definition, financial security is a financial condition characterized, firstly, by the balance and quality of the totality of financial instruments, technologies and services used by the enterprise, and secondly, by resistance to external and internal threats, and thirdly , the ability of the financial system of the enterprise to ensure the implementation of its financial interests, goals and objectives with a sufficient amount of financial resources, fourthly, to ensure the development of the entire financial system (Goryacheva K.S., 2006).

As follows from the material proposed above, there is no unambiguous approach to the definition of the concept of "financial security of an enterprise". The authors share the opinion that financial security is determined by:

• the level of deficit of the necessary funds to finance investment projects;

• stability and sustainability of the financial condition of the enterprise;

• normalization of financial flows and settlement relations;

• stability of relations with financial partners (investors, banks, etc.);

• the degree of protection of the interests of shareholders;

• providing financial conditions for enhancing investment and innovation activities of the enterprise.(Protsenko E.A., 2010).

The essential characteristics of the financial security of an enterprise can be described as follows:

• Financial security is one of the main elements of the economic security of an enterprise.

• Financial security can be characterized using a system of quantitative and qualitative indicators.

• Indicators of financial security should have threshold values, which can be used to judge the degree of financial security of the enterprise.

• The financial security of the enterprise must ensure its development and stability. An indicator of the development of an enterprise is the growth of its theoretical value, and an indicator of sustainability is the financial balance of an enterprise, both in the long and short term.

• Financial security ensures the protection of the company's financial interests.

Papekhin R.S. believes that the financial security of an enterprise directly depends on financial stability and consists in the ability of the enterprise to independently develop and implement a financial strategy in accordance with the goals of the overall corporate strategy, in an uncertain and competitive environment. The main condition for the financial security of an enterprise is the ability to withstand existing and emerging dangers and threats that seek to cause financial damage to the enterprise or it is undesirable to change the capital structure, or to forcibly liquidate the enterprise (Papekhin, R., 2007).

A fuzzy methodology for local entrepreneurial culture evaluation: evidence from post-soviet Kyrgyzstan was researched by Göleç, A. and Maksudunov, A.(Göleç, A., Maksudunov, A.,2019).

Representatives of the Western and Asian scientific community rarely consider indicators of financial security, focusing more on the assessment of its individual components: scientific works of such scientists as Ahmad S., Ng Ch., McManusc L. (Ahmad S., Ng Ch., McManusc L., 2014), Callahan, C. (Callahan, C. and Soileau, J., 2017), Cao Yu, Chen X. (Cao Yu, Chen X., 2012), Yu-Lun Chen (Chen, Y. and et.al.,2020), Dai L., Cooper K. (Dai L., Cooper K., 2007) and others; reliability of funding sources Kiss M., Breda G., Muha L. (Kiss M., Breda G., Muha L., 2019), Delas V. (Delas V., Nosova E., Yafinovych O., 2015), Krokhicheva G.E., Arkhipov E.L., Bazdikyan M.Yu., Istomin A.V. (Krokhicheva G.E., et.al, 2017), Zeng W., Koutny M. (Zeng W., Koutny M., 2019); indicators of financial autonomy have been studied by a number of economists such as B.Khodiev (Burkhanov, A.U., Tursunov, B.O., 2020), (Kalandarovna, A.G. and et.al., 2020), Tursunov B.O. (Tursunov, B. O., 2019), B. Yang (Yang, B., 2020) other.

Aspects of the national financial security strategy were studied by CIS scientists such as Bunevich G., Efimov V. (Bunevich G., Efimov V., 2015), Grosul V. Scientific works of

scientists Antonov E. (Grosul., Antonova, V., 2013), Rangel A. (Rangel, A., 2019) were devoted to the issues of ensuring and managing the security of enterprises. Schatz D. (Schatz D., Bashroush R., 2019), Grudz, V. (Grudz, V. and et.al., 2020) and others.

Analysis of scientific literature has shown that today there are two approaches to understanding the essence of the financial security of an enterprise. The first approach is based on the fact that financial security is considered as an integral part of the economic security of an enterprise. At the same time, it occupies a leading place in the composition of economic security. The second approach is based on the assumption that the financial security of an enterprise is an independent scientific concept and differs from economic security. The authors believe that for a deeper study, financial security should be considered as an independent scientific concept, but even if you look at it in the context of the most important component of economic security, the urgent task is to determine a set of indicators for its comprehensive assessment.

Methodology for assessing the financial security of textile enterprises

The current state of the economy of Uzbekistan, the development of market relations, the need to adapt the enterprise to changes in the external environment brings to the fore the solution to the problem of ensuring the financial security of enterprises. The mechanism for ensuring financial security must solve the main and complex problem - the implementation of enterprise management functions as a mechanism for balancing the internal components of the enterprise under the influence of environmental conditions.

The formation of the financial security system at the enterprise should provide for the relationship of clearly defined goals and objectives of each level of management. Horizontal and vertical levels of management should serve the same purpose as the overall management system. In our opinion, the financial security management system of an enterprise should be a complex of interrelated balanced solutions both in the field of ensuring the protection of the financial interests of a business entity and in the management of its financial activities.

From an economic point of view, the reliability of an enterprise reflects its stability, that is, such a financial and economic state in which economic activity ensures, in normal conditions, the fulfillment of all its obligations to employees, other organizations, the state due to sufficient income and the correspondence of income and expenses.

The formation of a mechanism for ensuring financial security is at the heart of strategic

planning, since the achievement of the desired result depends on a number of interdependent decisions. The first and main link in the development of such a mechanism is the formation of a methodology for assessing the financial security of an enterprise.

To assess the financial security of an enterprise, various methods can be used (Blazhevich., Kirilchuk, O., 2016):

• method based on analysis of cash flows;

• method based on the analysis of financial stability;

• methods of forecasting bankruptcy;

• scoring method;

• resource-functional method;

• method based on financial security analysis systems;

• graphic method;

• indicator method.

The methods have their limits of applicability, financial security with their help is considered from different positions. The effectiveness of the application of one method or another depends on the specific situation. The choice in favor of one of the assessment methods is made taking into account the purpose and objectives of the assessment, the specifics of the organization's activities, the availability of the necessary information, employee qualifications and other objective factors (Morozova., Morozov, A., 2021). A comprehensive assessment can be obtained using the indicator method. This article offers a mathematical model based on it.

Researchers in the field of enterprise management and analysis identify a number of key indicators characterizing the financial performance of a company, which can also reflect the current state of financial security. Such indicators are subdivided into 7 groups, consisting of a number of indicators (Table).

Table 1 - Indicators for assessing financial security

№	Indicator / group name	Standard
	Property status indicators	

1	Share of current assets in property	0,4-0,5
2	Share of receivables in property	0,2
3	Mobile assets ratio	0,67-1
4	Growth rate of enterprise property	1,1
	Liquidity and solvency indicators	
5	Absolute liquidity ratio (urgency ratio)	0,2-0,3
6	Adjusted (intermediate) liquidity ratio	0,7-0,8
7	Total liquidity ratio	1-2
8	Solvency ratio	0,5
	Financial soundness indicators	
9	Maneuverability of working capital	0,3
10	Growth rate of own working capital	1,1
11	Coefficient of providing current assets with own circulating assets	0,2
12	Equity capital flexibility	0,2
	Financial independence indicators	
13	Financial independence ratio	0,5
14	Funding ratio	1
15	Concentration ratio of stable funding sources	0,85
	Business activity indicators	
16	Asset turnover ratio	1
17	Turnover ratio of current assets	2
18	Inventory turnover ratio	4
19	Accounts receivable turnover ratio	12
20	Equity capital turnover ratio	2
21	Accounts payable turnover ratio	12
22	The duration of the production cycle	60
23	Financial cycle duration	45
	Profitability indicators	
	Return on equity	
24	Return on Total Equity (ROA)	0,07

25	Return on Equity (ROE)	0,1
26	Return on current assets	0,1
	Return on sales	
27	Gross profitability of products sold	0,2
28	Operating profitability of sold products	0,1
29	Net profitability from products sold	0,05
	Cash flow analysis indicators	
30	Growth rate of cash flows	1,1
31	Growth rate of cash payments	1,05
32	Ratio of receipts and payments	1,05
33	Net profitability of cash flows from operating activities	0,075
34	Operating profitability of cash flows from operating activities	0,1
35	Net profitability of total cash flows	0,05

In turn, within the framework of the indicator approach, three methods are also distinguished, which make it possible to interpret and analyze the obtained numerical values of indicators in different ways:

• a method for assessing the dynamics of the main indicators;

• method of indicator threshold values;

• method of using industry average indicators.

After receiving the actual values of the indicators, they are compared with the threshold values (using one of the methods or several methods simultaneously) in order to determine the level of financial security of the organization. Financial security levels are described in table 2.

Table 2 - Levels of financial security

№	Level name	Description
1	Normal	Financial security indicators are within the threshold values, and the degree of utilization of the available potential corresponds to technically sound standards for equipment and area utilization

2	Pre-crisis	Some indicators deviate from their threshold values in the direction of the deterioration of the financial condition of the organization, while others approach the corresponding values. At the same time, the technical and technological possibilities for improving the conditions and results of production by taking preventive measures against threats have not been lost. With this level of financial security, an immediate detailed development of the organization's financial recovery program is required.
3	Crisis	Most of the main indicators of financial security deviate significantly from the threshold values, there are signs of an irreversible decline in production and loss of potential due to the limited technical resource of equipment and areas. Here it is necessary to put into action the anti-crisis management system, including the study of the causes and nature of the development of the crisis, the development of methods, ways and means of overcoming the crisis phenomena.
4	Critical	For all indicators of financial security, there are irreversible gaps with threshold values, indicating that the organization is becoming insolvent for further activities. In this situation, the bankruptcy procedure is launched, provided for by the Federal Law “On Insolvency (Bankruptcy).

It can be seen from the description of the levels that the assignment of a company to one or another group is rather arbitrary. The boundaries between the levels are blurred, the permissible number of indicators with deviations from the standards, the value of the percentage deviation, which indicators are basic and which are of lesser importance are not indicated.

In this regard, the task of further deeper study of the importance of indicators and clarification of the definition of financial security levels seems to be an urgent task. It should also be noted that the existing levels of financial security have only one positive positioning of the company - "normal level", all other values indicate the presence of minor or critical problems in the company. This gradation does not indicate how far the company is before the transition from a normal state to a pre-crisis one.

The proposed division into levels of financial security assumes a reflection of the differences between the positions of the company in both negative and positive areas.

Table 3 - Modification of financial security levels

№	Level name	Description

	High	All financial security indicators are within the threshold values, most of the indicator values are significantly better than the threshold values, the degree of utilization of the available potential corresponds to technically sound standards for equipment and area utilization
	Normal	All indicators of financial security are within the threshold values, some indicator values are significantly better than the threshold values, the degree of utilization of the existing potential corresponds to technically sound standards for equipment and area utilization
	Satisfactory	All indicators of financial security are within the threshold values, the values of the indicators are slightly better than the threshold values, the degree of utilization of the available potential corresponds to technically sound standards for the load of equipment and areas
	Crisis	Some indicators deviate from their threshold values in the direction of the deterioration of the financial condition of the organization, while others approach the corresponding values. At the same time, the technical and technological possibilities for improving the conditions and results of production by taking preventive measures against threats have not been lost.
	Critical	Most of the main indicators of financial security deviate significantly from the threshold values, there are signs of an irreversible decline in production and loss of potential due to the limited technical resource of equipment and areas.
	Catastrophic	For all indicators of financial security, there are irreversible gaps with threshold values, indicating that the organization is becoming insolvent for further activities.

The assignment of a company to one or another level primarily indicates what actions should be taken by the management to avoid the emergence of financial difficulties. In this regard, a mathematical model can be used to determine the level of financial security of a company. Since there are no clear quantitative rules for determining the level of the company, the method of forming a fuzzy conclusion based on a fuzzy knowledge base can be used as a mathematical toolkit. Fuzzy inference is the approximation of the dependence $Y = f(X_1, X_2, \dots, X_n)$ of each output linguistic variable from the input linguistic variables and obtaining a conclusion in the form of a fuzzy set corresponding to the current values of the inputs using a fuzzy knowledge base and fuzzy operations. The linguistic variables are the input and output parameters of the system under consideration. addition (Kluchnikov M., and et.al., 2020).

To describe the process, a set of statements of the following type L_1 is given: if A_{11} and / or A_{21} and / or ... and / or A_{1m}, then B_{11} and / or ... and / or B_{1n},

L_2: if A_{21} and / or A_{22} and / or ... and / or A_{2m}, then B_{21} and / or ... and / or B_{2n},

.....

L_k: if A_{k1} and / or A_{k2} and / or ... and / or A_{km}, then B_{k1} and / or ... and / or B_{kn},

where A_{ij}, i = 1,2 ..., k j = 1,2, ..., m are fuzzy statements defined on the values of the input linguistic variables, and B_{ij}, i = 1,2 ..., k j = 1,2, ..., m are fuzzy statements defined on the values of the output linguistic variables. This set of rules is called a fuzzy knowledge base:

Thus, a company can be assigned to one of the above levels, to which it is proposed to assign numerical values:

Table 4 - Numerical assessment of the levels of financial security

Degree	Name	Assessment
1	High	+2
2	Normal	+1
3	Satisfactory	0
4	Crisis	-1
5	Critical	-2
6	Catastrophic	-3

The following three key criteria have an impact on the classification of a company to one level or another: assessment of the company **in relation to standards, assessment in relation to indicators of past periods, assessment in relation to average data for the industry.**

Criteria scores can be differentiated as follows:

• company assessment in relation to **standards**:

o all indicators are within the threshold values, most of them are significantly better;

o all indicators are within the threshold values, some are significantly better;

o all indicators are within the threshold values, some are marginally better;

o some indicators deviate from their threshold values towards the deterioration of the financial condition of the organization, the rest are approaching the corresponding values;

o most of the main indicators of financial security deviate significantly from the threshold values towards the worsening;

o for all indicators of financial security, there are irreversible breaks with threshold values.

• assessment in relation to the **indicators of past periods**:

o tendency to improve;

o maintaining a position;

o tendency to deteriorate;

• an estimate relative to the **industry average**:

o tendency to improve;

o maintaining a position;

o tendency to deteriorate.

Indicators for assessing financial independence can be divided into 7 groups (Table 1). Each group contains several indicators, for example, the “Property status indicators” group contains 4 indicators. In the existing model, for each indicator there are taken as standard values. For a more complete analysis, each of the indicators can be considered in the context of the three above-mentioned evaluation criteria: relative to standards, relative to indicators of past periods, relative to industry average data.

The influence of the values of these criteria on the classification of a company to a certain level of financial security can be described by a set of rules for a fuzzy knowledge base. The rules are formulated by a group of experts in the field of financial analysis and financial security analysis. The rules use logical functions AND and OR. The logical function AND denotes logical multiplication, and OR - The construction of the rule is an implication, the premise is indicated on the left, and the conclusion is indicated on the right. In Russian it corresponds to the form IF ... THEN. (Guseva A.I. and et.al.,2020).

To assess the level of financial security of a company, experts in this field have built the following rules:

1. **IF All** indicators of financial security are within the threshold values, **most of the indicator** values are significantly **better than** the threshold values AND there is a tendency for improvement relative to the previous period **AND** the company's indicators are better than the

industry average, **THEN** the company complies with the **High** level of financial security;

2. **IF All** financial security indicators are **within the threshold** values, **some** indicator values are significantly **better than** the threshold values **AND** ((there is a tendency for improvement relative to the previous period **AND** the company's indicators are at the level of the industry average) **OR** (the position of the previous period is preserved, the company's indicators **AND** the company's performance is better than the industry average), the company meets the Normal level of financial security;

3. **IF All** financial security indicators are **within the threshold** values, the indicator values are **slightly better** than the threshold values **AND** the position of the previous period is preserved, and the company's indicators **AND** the company's indicators are at the level of the industry average, **THEN** the company meets the **Satisfactory level** of financial security;

4. **IF Some** indicators deviate from their threshold values towards the deterioration of the financial condition of the organization, the rest approach the corresponding values **AND** ((there is a tendency for improvement relative to the previous period **AND** the company's indicators are at the level of the industry average) **OR** (there is a preservation of the position of the previous period indicators the company **AND** the company's indicators are better than the industry average), the company meets the **Crisis level** of financial security;

5. **IF Some** indicators deviate from their thresholds towards the deterioration of the financial condition of the organization, the rest approach the corresponding values of **AND** ((there is a tendency for deterioration relative to the previous period **AND** the company's indicators are worse than the industry average, **THEN** the company meets the **Critical Level** of Financial Security;

6. **IF most** of the main indicators of financial security deviate significantly from the threshold values towards the worsening **AND** (there is a tendency for deterioration relative to the previous period **OR** the company's performance is worse than the industry average), THEN the company meets the **Critical Level of Financial Security**;

7. **IF** there are irreversible breaks with thresholds for all financial security indicators, **THEN** the company meets the **Catastrophic level of financial security**.

To obtain a numerical assessment of the available data on the criteria, 10-point scales can be used. For example, the lowest score (zero) according to the criterion “Assessment of the company relative to standards” will be put down with the maximum degree of confidence (equal to one) by the expert if the company's position is characterized by the fact that there are irreversible breaks with threshold values for all financial security indicators. The better the

indicators are in relation to the standards, the higher the score is assigned by the expert with the corresponding degree of confidence in this.

After receiving the final graph, you can proceed to the last step - defuzzification. To do this, find the "center of gravity of the graph".

If the set $A = \frac{\sum_{i=1}^{n} x_i}{\mu_A(x_i)}$, then the center of gravity is determined by the formula:

$$a = \frac{\sum_{i=1}^{n} x_i \cdot \mu_A(x_i)}{\sum_{i=1}^{n} \mu_A(x_i)} \quad (2)$$

where x_i is the value along the abscissa axis, and $\mu_A(x_i)$ is the corresponding value of the graph along the ordinate axis.

The graphs can be used to assess the expert's confidence that the company has an appropriate level of financial security. With a confidence of 0.335, the expert will classify this company as a "Normal" level of financial security; with confidence 0.97 to the "Satisfactory" level, with confidence 0.475 to the "Crisis" level, with confidence 0 to all the others. Judging by the obtained result, the expert will be sure that the analyzed company belongs to the "Satisfactory" level in terms of the considered indicator.

After conducting a similar analysis procedure for all seven groups of financial security indicators, the manager can study the results and, on their basis, make informed decisions on issues related to the development of the enterprise.

The proposed methodology was implemented in assessing the financial security of the company "PromTekstil" (name changed). As a result, a summary diagram was built that clearly illustrates the position of the company.

The use of the proposed method made it possible to obtain a multilateral view of the state of the company's financial security, the resulting diagram clearly showed which aspects require more close attention and prompt intervention. These aspects were the focus of management, and as a result of further deliberate action of an operational and strategic nature, after a year, four of the seven indicators under consideration were improved by one conditional point, and another indicator (the indicator of "business activity") by two points at once.

Conclusions

A review of the most important characteristics of financial security shows that this category is a complex concept that needs more in-depth study. The existing methodological

approaches to assessing the financial security of industrial enterprises are insufficiently developed both in theoretical and organizational aspects. The financial security management process is defined as a set of works to ensure the maximum level of the company's solvency and the liquidity of its working capital, to increase the quality of planning and implementation of financial and economic activities of industrial enterprises. However, at the level of business entities, the aggregate study of the term "financial security" as an independent object of management has not yet been reflected in modern literature, and it is recognized only as one of the elements of economic security.

In conclusion, we can conclude that in order to ensure financial security at an enterprise, a system of quantitative and qualitative indicators should be determined to assess the current and future level of financial condition. Each aspect of the financial condition of the enterprise will correspond to normal limits on the values of quantitative indicators and a set of qualitative indicators that ensure stable protection of financial interests from identified real and potential threats of external and internal nature. It is more expedient to present quantitative indicators in the form of indicators that correspond to the characteristics of the object under study and allow for diagnostics and in-depth analysis of the financial security of the enterprise.

The proposed method for assessing the level of financial security of industrial enterprises makes it possible to assess the financial security of an industrial enterprise not only statically, at a certain moment, but also in dynamics, in the process of conducting economic activities, which is very important for adjusting the business development strategy. The knowledge base formed from a set of fuzzy rules makes it possible to assess the financial security of textile enterprises, however, the proposed methodology can be used not only in textile enterprises, but also in all other industries with a slight adjustment of the proposed rules. The technique allows the management to make informed decisions when choosing the optimal strategy for the further development of the enterprise in conditions of uncertainty.

References:

1. Ahmad S., Ng Ch., McManusc L., 2014. Enterprise risk management (ERM) implementation: Some empirical evidence from large Australian companies. *Procedia - Social and Behavioral Sciences* 164. pp. 541 – 547.
2. Blazhevich., Kirilchuk, O., 2016. *Assessment Of The Financial Security Of An Enterprise*

And Identification Of Ways To Improve It. 1st ed. Ukraine: Scientific Bulletin: Finance, Banks, Investments, pp.40-48.

3. Bogomolov and others, V., 2009. *Economic Security: Textbook. Manual For University Students Studying In Economics And Management.*. 1st ed. Moscow: UNITI-DANA, p.295 p.
4. Bunevich G., Efimov V., 2015. The main directions of the national strategy of financial security. Bulletin of the Moscow University named after S. Yu. Witte. *Series 1: Economics and Management*. 3 (14). S. pp. 68-74.
5. Burkhanov, A.U., Tursunov, B.O., 2020. Main indicators of textile enterprises' financial security assessment Vlakna a Textil, 27(3), pp. 35–40. Retrieved from http://vat.ft.tul.cz/Archive/VaT_2020_3.html.
6. Callahan, C. and Soileau, J., 2017. Does Enterprise risk management enhance operating performance?. Advances in Accounting, 37, pp.122-139. http://dx.doi.org/10.1016/j.adiac.2017.01.001
7. Cao Yu, Chen X., 2012. An agent-based simulation model of enterprises financial distress for the enterprise of different life cycle stage. *Simulation Modelling Practice and Theory* 20, pp. 70–88.
8. Chen, Y., Chuang, Y., Huang, H. and Shih, J., 2020. The value of implementing enterprise risk management: Evidence from Taiwan's financial industry. *The North American Journal of Economics and Finance*, 54, p.100926. , https://doi.org/10.1016/j.najef.2019.02.004
9. Dai L., Cooper K., 2007. Using FDAF to bridge the gap between enterprise and software architectures for security. *Science of Computer Programming* 66, pp. 87–102.
10. Delas V., Nosova E., Yafinovych O., 2015. Financial Security of Enterprises. *Procedia Economics and Finance* 27, pp. 248 – 266.
11. Göleç, A., Maksudunov, A. (2019) A fuzzy methodology for local entrepreneurial culture evaluation: evidence from post-soviet Kyrgyzstan. *South African Journal of Industrial Engineering*, 30(1), pp. 110–123
12. Goryacheva K.S., 2006. Mekhashzm upravlshnya fshansovoy bezpekoyu shdpriemstva: author. dis. on the science. steps of cand. econ. Sciences: spec. 08.06.01 / K. S. Goryacheva. - K., 17 p.
13. Grosul., Antonov, V., 2013. *Basic Approaches To Assessing The Financial Security Of An Enterprise Based On The Study Of Its Cash Flows.*. 1st ed. Moscow: Bulletin of SSTU.,

pp.278-282.

14. Grudz, V., Grudz, Y., Zapukhliak, V., Chudyk, I., Poberezhny, L., Slobodyan, N., & Bodnar, V., 2020. Optimal Gas Transport Management Taking into Account Reliability Factor, *Management Systems in Production Engineering*, *28*(3), 202-208. doi: https://doi.org/10.2478/mspe-2020-0030
15. Guseva A.I., Matrosova E.V., Tikhomirova A.N., Matrosov N.N., 2020. MULTICRITERIAL MODEL FOR ANALYSIS OF CLIENT LOYALTY // *Fundamental research*. No6. pp. 31-37.
16. Kalandarovna, A.G., Gaibnazarovich, G.S., Turgunovna, S.N., Shuxratovna, F.D., Ortikmirzaevich, T.B., 2020. Methodical aspects of establishing a control system over compliance with principles of decent work and social security in textile enterprises. *Journal of Advanced Research in Dynamical and Control Systems*, 12(5), pp. 73–81.
17. Kiss M., Breda G., Muha L., 2019. Information security aspects of Industry 4.0. *Procedia Manufactoring*. 32, pp. 848–855.
18. Kluchnikov M., Matrosova E., Tikhomirova A., Tikhomirova S. 2020. Development of an Optimal Production Plan Using Fuzzy Logic Tools. In: Samsonovich A. (eds) *Biologically Inspired Cognitive Architectures 2019. BICA 2019. Advances in Intelligent Systems and Computing*, vol 948. Springer, Cham.
19. Krokhicheva G.E., Arkhipov E.L., Bazdikyan M.Yu., Istomin A.V., 2017. Identification of Risk Situations in the System of Economic Security // Naukovodenie Internet Journal Volume 9, No.4. http://naukovedenie.ru/PDF/95EVN417.pdf (free access). Title from the screen. Yaz. rus., eng.
20. Morozova A.K., Morozov A.Yu., 2017. An integrated approach to managing the financial stability of an enterprise // *Russian Economic Internet Journal. No2.* / [Electronic resource]: READera. URL: https://readera.ru/142111398
21. Morozova., Morozov, A., 2021. *Criteria And Methods For Assessing The Financial Security Of An Organization*. 1st ed. Moscow: http://www.e-rej.ru/upload/iblock/cf3/cf3a78bfa2aeb0851539258e149bcdbd.pdf
22. Oleinikova, E., 2005. *Economic And National Security: A Textbook For University Students Studying In The Specialty "Nat. Economy "And Other Economy.*. 1st ed. Moscow: Examination, p.766 p.
23. Papekhin, R., 2007. *Factors Of Financial Stability And Security Of The Enterprise.*. 1st ed. Volgograd: abstract of thesis. [hello sciences. stup. Cand. ek. Sciences]., pp.21p.

24. Protsenko E.A., 2010. Threats to financial security of an enterprise and methods of neutralizing their influence. Protsenko. Electronic resource. Access mode: http://www.rusnauka.com/ 13_NPN_. Economics. 65 824.doc .htm.
25. Rangel, A., 2019. *Why Enterprises Need To Adopt 'Need-To-Know' Security*. 1st ed. USA: Computer Fraud & Security., pp.9-12.
26. Schatz D., Bashroush R., 2019. Security predictions—A way to reduce uncertainty. Journal of Information Security and Applications 45, pp. 107–116.
27. Senchagova, V., 2013. *Innovative Transformations As An Imperative For Sustainable Development And Economic Security Of Russia / Ed.*. 1st ed. Moscow: Ankil, p.688
28. Sudakova, O., 2008. *Modeling The Processes Of Managing The Economy-Free Enterprise*. 1st ed. Uzbekistan: Economics of Budivnstva and Myskogo State., p.4.
29. Tursunov B., Umarova, Yusupov, Bekmuradova, B., 2020. Methods for optimizing decision making in eliminating subjective psychological factors as a tool for ensuring the economic security of textile enterprises. *Journal of Advanced Research in Dynamical and Control Systems*, 12(5), pp.330-341.
30. Tursunov, B. O., 2019. Methodology for assessment the efficiency of production capacities management at textile enterprises. Vlakna a Textil, 26(2), pp. 74–81. Retrieved from http://vat.ft.tul.cz/Archive/VaT_2019_2.html
31. Yang, B., 2020. Construction of logistics financial security risk ontology model based on risk association and machine learning. *Safety Science*, 123, p. 104437, https://doi.org/10.1016/j.ssci.2019.08.005
32. Zeng W., Koutny M., 2019. Modelling and analysis of corporate efficiency and productivity loss associated with enterprise information security technologies. Journal of Information Security and Applications 49. 102385.