

Tetyana KorytkoInstitute of Industrial Economics of National Academy of Sciences of Ukraine,
Ukraine, <https://orcid.org/0000-0002-4251-1971>,  taniakorytko@gmail.com**Samira Piletska**

State University, Kyiv Aviation Institute, Ukraine,

 <https://orcid.org/0000-0002-3638-3002>,  508486185@ukr.net**Tetiana Kulinich**

Lviv Polytechnic National University, Ukraine,

 <https://orcid.org/0000-0003-0110-7080>,  tetiana.v.kulinich@lpnu.ua**Iryna Miahkykh**

Kyiv National University of Technologies and Design, Ukraine,

 <https://orcid.org/0000-0003-3868-9643>,  mred_1965@i.ua**Oleksandr Likhota**North Ukrainian Institute named after Heroes of Kruty of the Private Joint-
Stock Company „Higher Educational Institution „Interregional Academy of
Personnel Management”, Ukraine, <https://orcid.org/0000-0003-2948-4902>,  a-lihota@ukr.net

Formation of a Model for Assessing the Level of Financial Security of an Enterprise in a Changing External Environment

Opracowanie modelu oceny poziomu bezpieczeństwa finansowego
przedsiębiorstwa w zmieniającym się otoczeniu zewnętrznym

Abstract

The analysis of the development of approaches to assessing the financial security of an enterprise shows that there is no single methodology that confirms that certain problems exist and need to be solved. The working hypothesis adopted in the study is that financial threats are the factors that most destabilize financial security of an enterprise. The purpose of this article is to clarify the nature of the concepts of *financial security of an enterprise* and *financial security management* and to develop a methodological approach to assessing the financial security of an enterprise in a changing external environment. The methods used in the study of specific tasks were comparison and systematization; graphical; abstract and logical methods. The practical significance of the research results is that they substantiate the model for assessing financial security, which is an integral part of the overall enterprise management process. A model and algorithm for the formation and implementation of a strategy for ensuring the financial security of an enterprise are suggested.

Keywords: Model, Enterprise, Financial Security, Assessment Indicators, External Environment.**JEL:** G32, Q16, Q10, Q14

Streszczenie

Analiza rozwoju podejść do oceny bezpieczeństwa finansowego przedsiębiorstwa pokazuje, że nie ma jednej metodologii, która potwierdzałaby istnienie pewnych problemów i wymagała ich rozwiązania. Hipotezą roboczą badania jest założenie, że zagrożenia finansowe są najbardziej destabilizującymi czynnikami wpływającymi na poziom bezpieczeństwa finansowego przedsiębiorstwa. Celem artykułu jest wyjaśnienie treści pojęć „bezpieczeństwo finansowe przedsiębiorstwa”, „zarządzanie bezpieczeństwem finansowym” oraz opracowanie podejścia metodycznego do oceny bezpieczeństwa finansowego przedsiębiorstwa w zmieniającym się otoczeniu zewnętrznym. W badaniu poszczególnych zadań zastosowano następujące metody: porównawczą i systematyzacyjną; graficzną; abstrakcyjną i logiczną. Praktyczne znaczenie wyników badań polega na uzasadnieniu modelu oceny bezpieczeństwa finansowego, który jest integralną częścią całego procesu zarządzania przedsiębiorstwem. Zaproponowano model i algorytm tworzenia i wdrażania strategii zapewnienia bezpieczeństwa finansowego przedsiębiorstwa.

Słowa kluczowe: model, przedsiębiorstwo, bezpieczeństwo finansowe, wskaźniki oceny, środowisko zewnętrzne.**JEL:** G32, Q16, Q10, Q14

1. Introduction

One of the most important conditions for ensuring sustainable growth of an enterprise and positive results of its financial activity is the existence of an effective financial security system to guard against external and internal threats. The level of financial security of an enterprise determines the success of its operations in the current market conditions: the more secure the enterprise, the more competitive and attractive it is for investors. In a changing market environment, enterprises face the challenges of efficient use of available resources, searching for reserves to increase productivity, and optimizing their ownership structure. In order to solve these problems, the financial management services of an enterprise must manage its financial security. Thus, a mechanism needs to be devised to ensure the management of financial security of the enterprise and enable integration of the directions of its strategic development in the market.

The working hypothesis adopted in the study is that financial threats are the factors that most destabilize financial security of an enterprise.

The purpose of the study is to clarify the nature of the concepts of *financial security of an enterprise* and *financial security management* and further develop theoretical foundations and a methodological approach to assessing the financial security of an enterprise in a changing environment. The following methods were used in solving specific tasks: induction and deduction, comparison and systematization; method of analysis and synthesis of multiple correlation analysis; graphical method and abstract and logical method.

This study adds to the knowledge of the essence and methodology of assessing the financial security of an enterprise. This study emphasizes that financial security is a complex, dynamic system comprising interconnected elements. It is the result of the financial relations of the enterprise, and also depends on its production, sales, investment, financial and other activities. This is closely related to the specific nature of empirical research aimed at testing a hypothesis.

The second task is to obtain a greater understanding of the quantitative values obtained and used in economic research.

The third task is related to the need to implement modern achievements in the activities of enterprises.

The article is organized as follows: the introduction is followed by a review of the literature related to the management of financial security of enterprises in a changing environment. The next section describes the research methods used and presents the results of the study. The article concludes with the main conclusions.

2. Theoretical framework and hypothesis development

2.1. Essence and concept of *financial security of an enterprise*

The concept of *financial security* is a rather complex category, and thus there are various approaches to the interpretation of its economic essence. As there is no

single scientifically sound and officially approved approach to the definition of the concept of *financial security of an enterprise*, the optimal definition of this concept needs to be sought through comparing the scientific opinions of scientists, thus avoiding misunderstandings regarding the essence of financial security in the future.

Thus, Danylyshyn and Halak (Danylyshyn and Halak, 2010) consider financial security as the most important component of economic security of an enterprise, since all activities of the enterprise depend on it. A similar point of view is held by (Pleskach and Kulyk, 2009), who identify the financial subsystem as the main one in the system of economic security of an enterprise. Soroka (Soroka, 2013) also recognizes the financial component as dominant in the system of economic security.

Financial security is a state of business protection against risks and threats associated with financial and economic relations of business entities in both the internal (business processes) and external (external business communication) environment (Delas et al., 2015).

In turn, approaches presented by N. S. Krasnokutska and H. M. Kopteieva are specific as they identify the concept of *financial security of an enterprise* according to key features: components; independent objects of management; states; activities; processes; systems; complexes (Krasnokutska, 2019). Scientists (Klymash and Solovey, 2016) propose defining the term *financial security of an enterprise* according to division into the categories: *strategic; resource; system; protective; integrated; approaches to harmonization*. However, the difference between the *protective* and *harmonization* approaches is not very clear, since they result in achievement of a balanced state of the enterprise, and this determines the nature of these approaches. Thus, the supporters of the protective approach are Kornienko and Ponomarenko (Kornienko, 2018; Ponomarenko, 2010), as well as other scholars who, when defining the category of *financial security*, emphasize the protection of financial interests at all levels and the ability to ensure that the economic system functions effectively as a whole. Regarding the resource approach, conceptual foundations are proposed by Mulyk, Nartova, and Kyrychenko (Mulyk, 2013; Nartova, 2012; Kyrychenko et al., 2023), who in their studies note that *financial security* is the availability of financial resources and the ability to ensure further development and financial security of an enterprise regardless of the environment. Under the systemic approach, *financial security* is interpreted as a system that ensures the stability of the main financial proportions of the enterprise's development or ensures that the enterprise's growth is sustainable, or a system of quantitative and qualitative indicators of the financial condition of the enterprise that reflect its financial stability (this approach considers *financial security of the enterprise*) (Lavrova, 2011; Kudrytska, 2011). Supporters of the integrated approach define *financial security* as an important complex characteristic that reflects the level of protection of the financial interests of the enterprise and their consistency with the existing potential of the enterprise. This makes it possible to withstand various destructive factors when conducting financial and economic activities (Krasnokutska and Kopteieva, 2019).

A detailed analysis of the different opinions of scientists (Davydenko et al., 2024; Dokienko et al., 2021; Hanushchak, 2017; Honchar et al., 2020; Nguyen and Nguyen, 2020; Sosnovska, and Zhytar, 2018) and their approaches to understanding

the concept of *financial security*" (fig. 1) was conducted to clarify the essence of financial security of an enterprise. This was done by grouping approaches to this concept. The aim was to identify areas for strengthening the financial security of an enterprise by identifying the relevant factors.

Studying and analyzing various interpretations of this concept and identifying the main features these interpretations have in common made it possible to formulate a definition of the *financial security of an enterprise*.

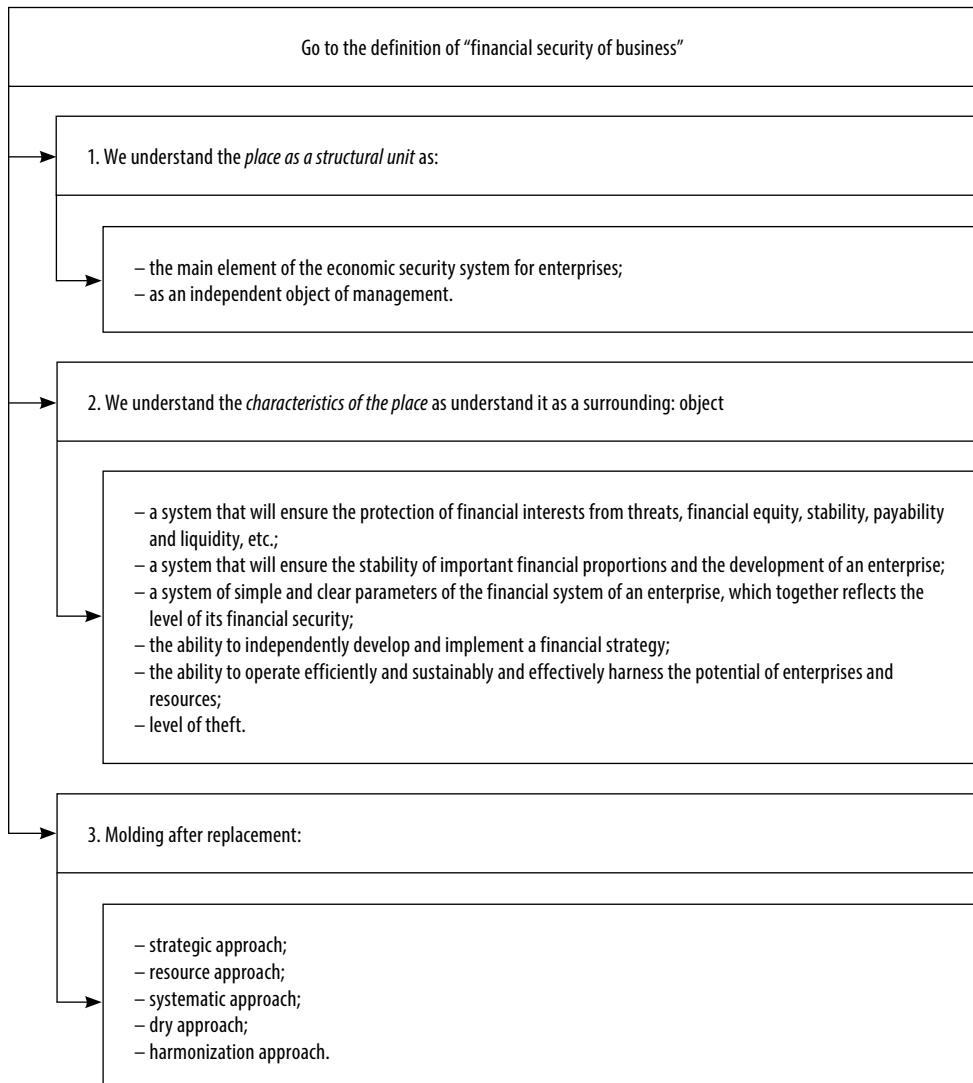
Thus, the *financial security of an enterprise* is enterprise financial system security that is stable and in which financial resources are put to efficient use; it is the ability to withstand various existing and potential threats due to the financial management of an enterprise, to make its operations sustainable and ensure further development and growth.

2.2. The specific nature of enterprise financial security management

Financial security, and providing it are important components of effective strategic management of enterprises. Therefore, in our opinion, it is also advisable to identify a managerial approach. Under a managerial approach, the financial security of an enterprise should be considered either as an independent object of management or as an integral part of the economic security of an enterprise with appropriate management tools.

A significant group of scholars supports the perception of financial security management as actions to ensure protection of the enterprise in the financial sphere. The essence of this concept is...*a set of views aimed at ensuring financial security, as well as identifying and formulating ways to eliminate all possible threats* (Kartuzov, 2012). A number of authors specify security objects as ...*organization and management of finances, planning, control and analysis of finances, information resources, foreign economic activity, personnel, etc.* (Kim, 2009), which require special attention from personnel responsible for security.

Figure 1.
Approaches to the definition of financial stability of an enterprise



Source: author's own study.

Some authors propose defining financial security management as "a constant process of analyzing the financial condition and internal environment of the enterprise, as well as monitoring the implementation of a set of measures aimed at achieving the required level of financial security" (Marchenko, 2008). This approach involves the systematic monitoring of the internal and external environment of the enterprise to achieve and maintain the required level of security. Although the author does not mention the need to determine the impact of threats, systematic

monitoring and focus on maintaining the required level of security implies active measures on the part of security actors in relation to all destabilizing factors. According to (Yanioglo, 2015), financial security management of an enterprise is a system of management decisions related to ensuring the protection of the priority financial and economic interests of the enterprise. In this context, the definition provided by Kyrychenko and Kudria (Kyrychenko and Kudria, 2009) is rather convincing, as it considers management as a set of financial security relations implemented through the organizational structure and management functions, regulatory, legal, organizational and economic support, threat response processes and the availability of a decision-making model depending on the situation.

The study showed that management should be understood as a process in which the relevant functions are implemented and a system that implements these functions through the organizational system; a set of financial security relations implemented through the organizational structure and management functions, regulatory, legal, organizational and economic support, threat response processes and the availability of a decision-making model depending on the situation; a system of principles and methods for developing and implementing management decisions related to financial security management. Meanwhile, insufficient attention is paid to the formation of strategic alternatives to ensure the financial security of the enterprise.

2.3. Methodology for assessing the financial security of an enterprise

Despite a significant number of publications, certain aspects of assessing the financial security of an enterprise remain the focus of attention of many researchers. This is due to the complexity and multiplicity of features of financial security, the large number of indicators on which it depends, and rapid changes in the external environment, which is a source of new shocks and challenges.

The authors of this article (Guryanova et al., 2017) suggested a set of models for analyzing financial security based on multivariate statistical analysis, vector autoregression technologies and error correction models. Y. Krakos and R. Razgon (2008) proposed a scoring model for assessing the financial security of an enterprise based on five groups of indicators that reflect profitability, solvency, business activity, market stability and investment attractiveness of an enterprise. The components of the resulting index are calculated using the dynamic rating method. The disadvantage of this approach is that it enables the level of financial security to be determined relative to the importance of this characteristic on average in the industry, while it does not determine the actual level of financial security. This makes it difficult to interpret the results. The approach based on the rating assessment is presented in Azarenkova (Azarenkova et al., 2014). This approach involves determining the level of financial security in three classes by calculating a weighted score using the ratings of the initial indicators. The disadvantage of this method is that there are no reasonable limits for the values of indicators, which limits its use. In the assessment, a composite index is widely used based on a linear additive convolution of private composite indices (Blazhevych, 2010). These indicators reflect individual components of the financial security of the enterprise. This

approach determines the minimum level of financial security of enterprises, while under this method it is not possible to interpret the results. To assess the level of financial security (Bilomistna et al., 2010year?), regression models are proposed that can be used to identify the impact of the most significant factors on the final result. However, these models are of limited use, since the number of indicators included in the model is limited by the amount of initial data. In addition, they cannot be used to assess the level of financial security.

The results of this review allow us to develop our own approach to assessing financial security of enterprises. Its purpose is to eliminate the shortcomings inherent in the above methods, in particular to reduce the effect of compensation for exceeding the normative values of indicators, as well as to determine and justify the levels of financial security.

3. Methodology

3.1. Stages of developing a methodological approach to assessing the financial security of an enterprise

The research methodology is based on the process approach, which uses the following methods: induction and deduction, comparison and systematization in the study of the essential characteristics and evolution of the concept of *financial security of an enterprise*; analysis and generalization for critical study of published scientific works on financial security of enterprises; the multiple correlation analysis method to justify the choice of indicators; a graphical method for visual representation of theoretical and methodological material; abstract and logical methods for theoretical generalizations and conclusions of the study.

The processes characterizing the formation, use and development of an enterprise are the basis for managing its financial security. The creation of a system for ensuring the financial security of an enterprise involves an active search for strategic opportunities and resources, as well as the identification and mobilization of internal reserves in order to make the enterprise more competitive (Piletska and Myagkykh, 2023).

The success of an enterprise is a key factor in ensuring its financial security. The level of performance directly affects the continuity and efficiency of its operational and production processes.

Ensuring the financial security of an enterprise means planning, organizing, and controlling its financial resources that are necessary for its production and economic activities, while also providing sufficient equity capital to maintain an adequate level of liquidity and overall financial stability of the enterprise. Determination of financial security and its quality management is the main need of a company and a condition for it to operate effectively.

It is important for businesses to understand the main trends in the industry, the structure and requirements of the market, and the factors that have a significant impact on their operations. Enterprises can be made to operate more efficiently

through strategic management. Strategic management of a company's financial security includes the following stages:

Stage 1. Formation of goals. The main goal of financial security management is to maintain the financial balance of the enterprise during its strategic and effective functioning and development. This goal is achieved through the rational and efficient use of resources, maintaining adequate levels of liquidity, financial stability, and solvency, as well as through the continuous stimulation of the enterprise's existing potential to support sustainable development.

Stage 2. Formation of management objectives. Management objectives are defined based on research into development directions and on enhancing the utilization and continuous development of the enterprise's internal potential.

The main task is to ensure that the procedure for such calculations enables sufficiently reliable results to be obtained that can be relied on when choosing an economic alternative. In addition, the mechanism of financial security formation should be based on the intra-systemic features of the enterprise, i.e. the financial and economic system itself should contain *built-in* mechanisms for preventing external and internal threats.

Stage 3. Strategic analysis and strategic choice. In order to determine the prospective directions of development of enterprises and formulate strategic objectives, it is necessary to take into account the impact of external and internal factors of their activities. The use of PEST analysis will reflect the degree to which external factors influence various dimensions of the enterprise's environment, namely political, economic, socio-cultural, and technological aspects (Ribeiro Ramos, 2022). Thus, based on a strategic approach to ensuring the financial security of the enterprise, the interaction of the external and internal environment is taken into account. The influence of internal factors is assessed on the basis of a SWOT analysis, and external factors – on the basis of a PEST analysis (Vasylyshyn et al., 2021).

The result of the mutual influence of the internal environment and the financial security of the enterprise is the ability to ensure its efficiency, i.e. the efficient use of resources, and create organizational conditions to develop and ensure integration activities.

Stage 4. Choosing a strategy. This stage provides a transition to the *strategy of ensuring the financial security of the enterprise*, which should be aimed at achieving the required level of financial security of the enterprise while balancing various parameters of limited growth of operating activities.

The choice of a strategy aimed at ensuring financial security is based on the use of the method of hierarchy analysis (MAI). This method is based on the principle of identity and decomposition, which reflects the procedures for synthesizing multiple statements, prioritizing criteria, and finding alternative solutions (Piletska and Korytko, 2023).

Stage 5. Ensuring the implementation of the strategy. At this stage, the strategy is put into action through a set of specific measures aimed at achieving the defined strategic objectives and performance benchmarks. Achievement of strategic benchmarks and criteria to implement the strategy effectively is ensured by the financial security management mechanism.

In accordance with the chosen strategy, in conditions of economic instability, the company should adhere to a conservative type of financial policy, the methods and style of management decision-making of which are focused on minimizing financial risks. While ensuring a sufficient level of financial security of the enterprise, this type of financial policy cannot provide sufficiently high final results of its financial activity.

Stage 6. Control over strategy implementation. Control over the implementation of the chosen strategy for ensuring the financial security of the enterprise is exercised on an ongoing basis in terms of quantitative and qualitative characteristics that meet the goals set.

Thus, the system of ensuring the financial security of an enterprise is a complex process of objective and reasonable influence on its components in order to achieve financial growth and financial stability; the aim is to increase the economic and social efficiency of its activities.

As in any system, in the process of ensuring the financial security of an enterprise, subsystems can be identified which ensure effectiveness of the system as a whole, provided that the subsystems function. The system consists of four subsystems: target, supporting, managed and controlling.

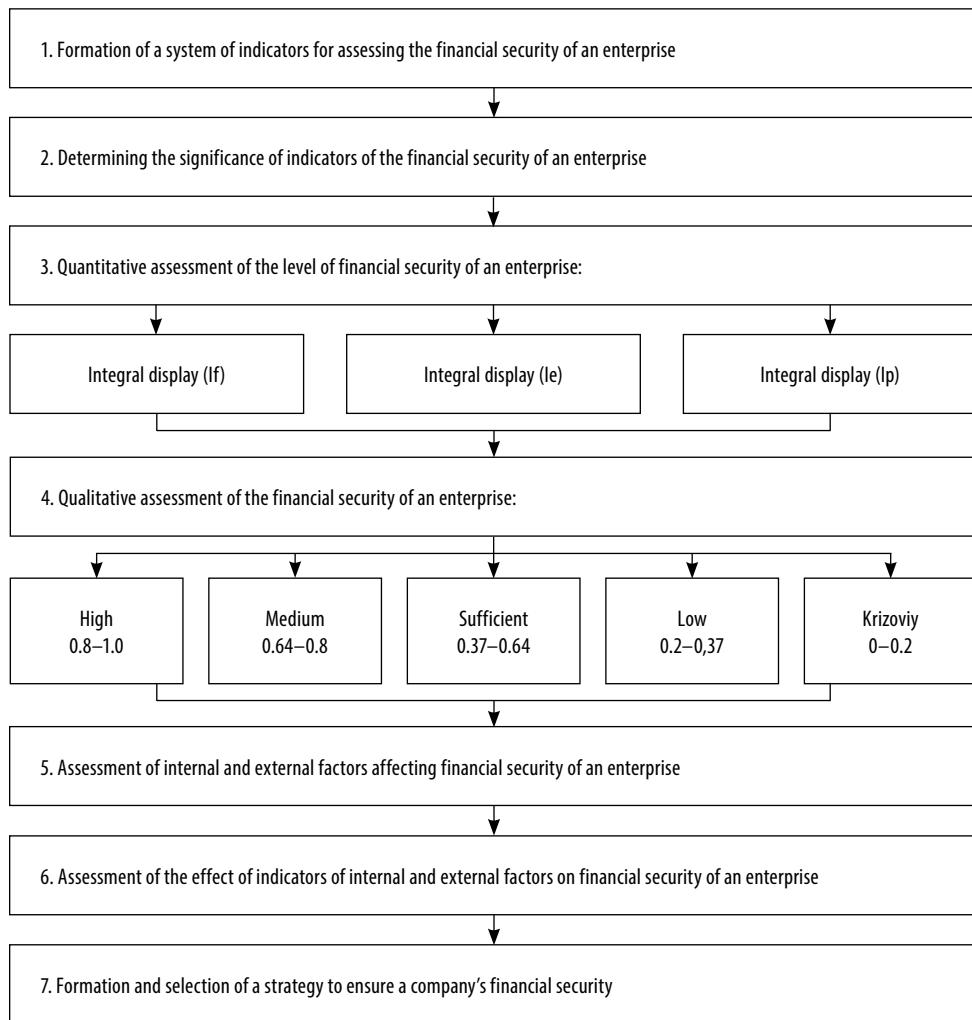
The target subsystem of financial security of an enterprise consists of two components: optimal use of the existing level of security, and pursuing the directions in which it can be improved. After setting the targets, it is necessary to determine the components of the support subsystem. The controlling subsystem defines specific areas of the enterprise's activities in terms of creating innovations, and acquiring and implementing those innovations.

The management subsystem is the fundamental and coordinating subsystem, which includes personnel management, development and adoption of management decisions on financial security, and coordination of measures for its use and development. These components determine the quality of all other financial security subsystems of the enterprise.

The controlling subsystem is crucial, as its scope covers all major subsystems, reflects the multidimensional nature of financial security, and focuses on identifying internal reserves, developing mechanisms for their effective use, and ensuring the enterprise's adaptability to changing environmental conditions.

Creating conditions for effective financial security allows the enterprise to maintain solvency and increase added value, and thus its market value. This which will help to satisfy the financial interests of shareholders, creditors, other stakeholders and external entities evaluating investments in the enterprise concerned.

As noted above, the process of strategic provision of financial security of an enterprise is determined by the appropriate model for assessing financial security (fig. 2).

Figure 2.*Model for assessing financial security of an enterprise in a changing external environment*

Source: author's own study.

The financial security assessment model is an integral part of the overall enterprise management process. Ensuring the financial security of an enterprise directly depends on the effectiveness of the management system. This process is determined not only by the availability of resources, but also by the way in which they are distributed and used, and by timely replenishment. This model is specific due to its constant development, while it should be progressive and aimed at supporting the sustainable growth of the enterprise's efficiency.

The basis of the model for assessing the financial security of an enterprise is the principles, goals and factors that regulate the internal and external environment. The formation of a system of factors influencing the financial security of an

enterprise is grounded in the principle of identifying specific areas of influence on the key components of the enterprise's financial security. This system of factors helps to improve financial security and will mean that the financial resources necessary for the successful operation of the enterprise will be put to more efficient use. Internal variables, being situational factors within the enterprise, have a significant impact on the financial security of the enterprise (Zinchenko et al., 2022).

The purpose of the financial security assessment model is to determine the level of integration and differentiation between its elements and links, which will ensure maximum efficiency of the enterprise as an open system.

3.2. Formation of a model for assessing the financial security of enterprise

Assessment of financial security of an enterprise is a complex dynamic process focused on maximizing interaction with the external environment and ensuring high quality of implementation, while it is important to determine the factors that affect the level of balance and efficiency of the use of financial resources.

The system of indicators is devised using multiple correlation analysis, which makes it possible to take into account the interrelationships of many indicators, which corresponds to economic realities and systemic interrelationships in economic processes. The use of multiple correlation analysis allowed us to identify significant indicators for each group.

Since the indicators have different dimensions, it is advisable to normalize the indicators characterizing the financial security of the enterprise.

The assessment of the financial security of an enterprise is based on the calculation of an integral indicator, which is defined as a geometric mean.

Financial, production and performance indicators are used for the calculation (1).

Table 1.
Indicators for assessing the financial security of an enterprise

Group of indicators	Indicators
Financial indicators	Current liquidity ratio (K_1)
	Coefficient of financial stability (K_2)
	Coefficient of maneuverability of own capital (K_3)
	Coefficient of maneuverability of own capital (K_4)
Integral indicator (If)	$If = \sqrt[4]{K_1 \cdot K_2 \cdot K_3 \cdot K_4}$
Performance indicators	Asset turnover ratio (K_1)
	The turnover ratio of working capital (K_2)
	Profitability of sales (K_3)
	Profitability of assets (K_4)
Integral indicator (Ie)	$Ie = \sqrt[4]{K_1 \cdot K_2 \cdot K_3 \cdot K_4}$

Group of indicators	Indicators
Production indicators	Fund return (K_1)
	Dynamics of revenue volume (K_2)
	Staff turnover (K_3)
	Labor productivity (K_4)
Integral indicator (I_p)	$I_p = \sqrt[4]{K_1 \cdot K_2 \cdot K_3 \cdot K_4}$
An integral indicator of financial security (IFB)	$IFB = \sqrt[3]{I_f \cdot I_e \cdot I_p}$

Source: author's own study.

It is recommended to evaluate the compliance of financial security based on the Harrington Preference Scale. The integral indicator of financial security of an enterprise should be interpreted and the level determined on the basis of table 2.

After completing a comprehensive analysis of the financial security of an enterprise, the optimal strategy for ensuring financial security is selected. Given the rapidly changing environmental conditions, impacted by various factors, a strategy should be developed to adapt to these changes. In this regard, the financial security strategy should be flexible and able to respond to new challenges and threats arising in the external environment. In addition, the strategy should take into account the strengths and weaknesses of the enterprise, its opportunities and threats, market development forecasts, and changes in legislation.

Table 2.
Qualitative assessment of financial security of an enterprise

Level of financial security	Value	Content
High	0.8–1.0	An enterprise can mobilize financial resources from internal sources and attract financial resources from external sources
Average	0.64–0.8	The enterprise can mobilize financial resources from internal sources, but its financial condition and the level of financial risk do not allow it to attract financial resources from external sources on favorable terms. Stable financial condition, high financial flexibility, stability, solvency, a high level of financial security. Most of the true values of indicators exceed the normative values.
Suf-ficient	0.37–0.64	The enterprise can mobilize financial resources from internal sources, but its financial condition and the level of financial risk allow it to attract financial resources from external sources only to cover cash gaps in current operations. Balanced structure of assets and liabilities, current financial flexibility, stability, solvency, acceptable level of financial security. Most of the true values of indicators correspond to the optimal (normative) values.
Low	0.2–0.37	The enterprise can mobilize financial resources from internal sources, but its financial condition and the level of financial risk do not allow it to attract financial resources from external sources on favorable terms. The value of the integral indicator is closer to the lower limit of the designated interval. The smaller portion of true values of indicators corresponds to optimal (normative) values. There is a probability of increasing financial security to the average level by implementing strategic changes
Critical	0–0.2	The enterprise does not have the capability to mobilize financial resources at the expense of internal sources. Its financial condition and the level of financial risk prevent it from attracting financial resources from external sources on favorable conditions

Source: author's own study.

Thus, the selection and implementation of an effective financial security strategy is an important task for any enterprise seeking sustainable development in a constantly changing environment.

4. Results

The authors have proposed a methodological approach to assessing the financial security of an enterprise. To solve this problem, the authors calculated and evaluated indicators (financial, production and performance) based on the example of one enterprise.

Transport, being a part of the sphere of material production and one of the sectors of the economy, connects producers of goods and services with their consumers. Transportation is essentially a material flow of goods and passengers, the capacity and directions of which are determined by the needs of the global and national economy. The suggested methodological approach was tested on the example of the transport enterprise LLC "Avtobudcomplex-K" (a fragment of the initial data is given in the appendix). This company is a large enterprise that specializes in comprehensive support of the construction industry. The company provides a wide range of services, including road transportation of construction materials across Ukraine, management of transport assets, and production of high-quality ready-mixed concrete and construction mixes.

The results of calculation of the integral indicator of the financial security of the enterprise are given in table 3.

Table 3.
Development of the indicator of financial security of an enterprise

Indexes	2021	2022	2023
Financial indicators			
Flow liquidity ratio (K_1)	0.25	0.15	0.11
Coefficient of financial stability (K_2)	0.45	0.43	0.41
Equity maneuverability ratio (K_3)	0.38	0.25	0.14
Coefficient of autonomy (K_4)	0.43	0.40	0.38
Integral index (If)	0.368	0.283	0.221
Performance indicators			
Asset turnover ratio (K1)	1.25	0.89	1.01
The turnover ratio of working capital (K2)	1.33	1.12	0.84
Profitability of sales (K3)	0.05	0.03	0.04
Return on assets (K4)	0.08	0.06	0.07
Integral index (Ie)	0.286	0.206	0.221
Production indicators			
Fund return (K1)	0.33	0.84	0.91
Dynamics of revenue volume (K2)	0.83	0.18	0.04

Indexes	2021	2022	2023
Personnel turnover (K3)	3.44	5.03	5.61
Productivity (K4)	0.33	0.86	0.45
Integral index (Ii)	0.747	0.899	0.85
An integral indicator of financial security (IFS)	0.530	0.478	0.451

Source: author's own study based on LLC "Avtobudcomplex-K".

The obtained result indicates a decrease in the integrated indicator of financial security of the enterprise from 0.53 to 0.451, which is a negative trend. The obtained value indicates that the company has the ability to mobilize financial internal sources, but its level of financial security allows it to attract financial resources from external sources only to cover cash gaps in current operations. The company has a balanced structure of assets and liabilities, current financial flexibility, stability, solvency, and an acceptable level of financial security. At the same time, most of the true values of the indicators do not always correspond to the optimal (normative) values.

Financial security can be improved by using the enterprise's resources more efficiently. In order to improve the effectiveness of financial security, all aspects that optimize economic resources of the enterprise and overall development should be considered.

To manage financial security more effectively, it is necessary to consider all possible levers that have a positive impact on the provision of resources of the enterprise and its overall development. The main function of ensuring the financial security of the enterprise is the optimization of its financial resources.

5. Discussion and Conclusions

This article examines the essence of managing the financial security of an enterprise. The conclusions obtained are confirmed by studies of scientists who deal with the issues of the essence of the financial security of an enterprise (Krasnokutska, 2019; Danylyshyn, 2010; Pleskach, 2009; Soroka, 2013) and conduct research into the financial management of security of an enterprise (Davydenko, 2024; Dokienko, 2021).

Performing the first task clarifies the nature of the concepts of *financial security of the enterprise* and *financial security management* (fig. 1). As a result of the analysis of existing developments in the management of the financial security of the enterprise, the problem of inefficient use of tools to ensure it was identified. Due to performing the second task, the feasibility was determined of implementing the suggested methodological approach to assessing the level of financial security of the enterprise in the external environment (fig. 2, table 1). In this study, a conclusion was made regarding the qualitative assessment of financial security (table 2) due to which the third task was performed.

A positive direction for the development of the study should be the suggested methodological approach to assessing financial security, enabling informed management decision-making.

The main task of ensuring the proper level of financial security of an enterprise is the optimization of financial flows, which, in turn, helps to increase profits. The results obtained solve most of the current problems that exist in the implementation of innovations, technologies and innovative tools for managing the financial security of an enterprise to ensure the effective operation and sustainable development of the enterprise, and make it more competitive.

The suggested model can be applied in enterprises, but is not suitable for banking organizations and budgetary institutions to determine financial security. In addition, the results of the study solve problems (Kyrychenko, 2009; Marusyak, 2022); the authors only outlined the main patterns for assessing the level of financial security of an enterprise.

This further emphasizes the value of the results of this study. The limitation of this study is the inability to apply the results to business entities outside the production sphere.

The main drawback of the study is the non-objectivity of the systematization of information on the use of methods and techniques for determining financial security. This drawback of the study should be taken into account in the case of further study of the outlined issues when developing this topic. Thus, the hierarchical analysis method can be applied to determine the influence of external and internal environmental factors on the management of the financial security of an enterprise.

Acknowledgements

The authors would like to thank anonymous referees for their valuable comments that helped improve the quality of this paper.

References

Arefieva, O., Tytykalo, V., & Kovalenko, N. (2023). The Economic Mechanism of Ensuring the Financial Security of Enterprises in Case of Instability of the External Environment. *Adaptive Management: Theory and Practice*, 16(32). [https://doi.org/10.33296/2707-0654-16\(32\)-03](https://doi.org/10.33296/2707-0654-16(32)-03)

Azarenkova, G. M., Bondarenko, I. I., & Azarenkov S. G. (2014). Zabezpechennia finansovoї bezpeky pidpryiemstva yak osnovy yoho efektyvnoi diialnosti (Providing Financial Security of the Enterprise as a Basis for Its Effective Activity). *Finansovo-kredytyna diialnist. Problemy teorii i praktyky*, 1(16), 168–176.

Bilomistna, I., Bilomistnyi, O., & Oliynyk, O. (2014). Diahnostuvannia finansovoї bezpeky pidpryiemstva. *Socio-Economic Problems of the Modern Period of Ukraine*, 1, 623–636.

Blazhevich, O. G. (2010). Finansovaya bezopasnost predpriyatiy: Opredelenie minimalno neobhodimogo urovnya. *Finansyi. Banki. Investitsii*, 3(8), 25–31.

Danylyshyn, T. R. (2010). Financial Security as a Component of Economic Security of Enterprises. *Economics*, 12, 13–15.

Davidenko, N., Vasilevskaya, N., Titenko, Z., & Wasilewski, M. (2024). Justification of the Mechanism for Neutralizing Risks in Managing the Financial Security of Agricultural Enterprises. *Sustainable Development*, 16(3), 1159. <https://doi.org/10.3390/su16031159>

Delas, V., Nosova, E., & Yafinovych, O. (2015). Financial Security of Enterprises. *Procedia Economics and Finance*, 27(91), 248–266. [http://doi.org/10.1016/S2212-5671\(15\)00998-3](http://doi.org/10.1016/S2212-5671(15)00998-3)

Dokienko, L., Hryniuk, N., Nakonechnaya, O., & Mykhailyk, O. (2021). The System for Evaluating the Financial Security of the Operational Activities of the Enterprises of the Oil and Fat Industry. *Economics of agriculture and resources: International Scientific Electronic Journal*, 7(4), 138–159. <https://doi.org/10.51599/are.2021.07.04.08>

Ganushchak, T. (2017). Dynamics of Development of Financial Safety of the Enterprise as a Complex Economic Security of the State. *Baltic Journal of Economic Studies*, 4, 32–37. <https://doi.org/10.30525/2256-0742/2017-3-4-32-37.14>

Gonchar, O., Khachatrian, V., Ostapchuk, O., & Bitiy, A. (2020). Financial Security Assessment in Enterprise Potential Management. *Studies of Applied Economics*, 4. <https://doi.org/10.25115/eea.v38i4.4026>

Guryanova, L. S., Klebanova, T. S., Milevskiy, S. V., Nepomnyaschiy, V. V., & Rudachenko, O. A. (2017). Models for the Analysis of the State's Financial Security Indicators Dynamics. *Finansovo-kredytyna dialnist. Problemy teorii i praktiky*, 1(22), 254–264.

Kartuzov, E. P. (2012). Definition of Financial Security of the Enterprise: Concept, Content, Meaning and Functional Aspects. *Current Problems of the Economy*, 8, 172–181.

Kim, Y. G. (2019). Management of the Financial Security System of the Enterprise: Autoref. Thesis for Obtaining Sciences. *Candidate Degree Economy Sciences*, 21.

Klymash, N. I., & Solovei, K. V. (2016). Scientific Approaches to Defining the Essence of the Concept of "Financial Security". *Scientific Bulletin of Kherson State University*, 16(1), 120–123. http://www.ej.kherson.ua/journal/economic_16/1/31.pdf

Kornienko, T. O. (2018). The Essence and Evolution of the Concept of "Economic Security". *Economic Horizons*, 1(4). <http://eh.udpu.edu.ua/article/view/113118/128930>

Krakos, J. B., & Razgon, R. A. (2008). Upravlinnia finansovoiu bezpekoiu pidprijemstv. *Ekonomika ta upravlinnia pidprijemstvamy mashynobudivnoi haluzi*, 1(1), 86–97.

Krasnokutska, N. S., & Kopteva, H. M. (2019). Definition of the Concept of "Financial Security of the Enterprise": Main Approaches and Features. *Business Inform.*, 7, 14–19. <https://doi.org/10.32983/2222-4459-2019-7-14-19>

Kudrytska, Zh. (2012). The Financial Security Management System of the Enterprise. *Efficient Economy*, 1. <http://www.economy-nayka.com.ua>

Kyrychenko, O. A., & Kudrytska, I. V. (2009). Improving the Management of Financial Security of Enterprises in Crisis Conditions. *Investments: Practice and Experience*, 22–26.

Lavrova, Y. V. (2011). Financial Security of the Enterprise: Classification of Threats. *Economic Analysis*, 9(2), 274–277.

Lyakhovich, O. O., & Seredyuk, O. S. (2023). Integrated Assessment of the Level of Financial Security of the Financial Security of the Enterprise. *Bulletin of the NUVHP*, 2(102). <https://doi.org/10.31713/ve2202311>

Marchenko, O. M. (2008). Management of Financial Security of Agro-industrial Production in Conditions of Economic Transformation of Ukraine: Autoref. Thesis for Obtaining Sciences. *Candidate Degree Economy Sciences*, 25.

Marusia, N. L., & Bak, N. A. (2022). Financial Security of the Enterprise and Threats of Its Loss in the Modern Economic Environment. *Economy and the State*, 2, 109.

Melnichenko, A. (2020). Is Artificial Intelligence Ready to Assess the Financial Security of an Enterprise? *Financial Risk Management*, 13(9), 191. <https://doi.org/10.3390/jrfm13090191>

Mulyk, Y. I. (2013). The Essence of the Concept of "Financial Security of the Enterprise": Systematization of Scientific Views. *Collection of Scientific Works of VNAU*, 3(80), 195–206.

Nartova, I. V., & Kirichenko, Y. O. (n.d.). The Essence of the Definition of "Financial Security" and Related Categories and Concepts. http://www.rusnauka.com/6_PNI_2012/Economics/3_102433.doc.htm

Nguyen, V. C., & Nguyen, T. N. (2020). Financial Security of Vietnamese Businesses and Its Influencing Factors. *Journal of Asian finance, economics and business*, 2, 75–87. <https://doi.org/10.13106/jafeb.2020.vol7.no2.75>

Piletska, S. T., & Korytko, T. Y. (2023). Formation of a Strategy for Ensuring the Financial Security of the Enterprise. *Ukrainian Journal of Applied Economics and Technology*, 8(2), 224–230. <https://doi.org/10.36887/2415-8453-2023-2-32>

Piletska, S. T., & Myagkikh, I. M. (2023). The Mechanism for Ensuring the Financial Security of Enterprises In the Conditions of the Knowledge Economy. *Economy and Society*, (53). <https://doi.org/10.32782/2524-0072/2023-53-29>

Pleskach, V. L. (2009). Methodological Principles of State Regulation of Financial and Economic Development. *Finances of Ukraine*, 10, 27–35.

Ponomarenko, O. E. (2010). Theoretical Aspects of Financial Security of Enterprises: Autoref. Thesis Ph.D. *Economy of Science*.

Ribeiro Ramos, O., Myronenko, Ye., Britchenko, I., Zhuk, O., & Patlachuk, V. (2022). Economic Security as an Element of Corporate Management. *Financial and Credit Activity: Problems of Theory and Practice*, 42, 304–312. <https://doi.org/10.55643/fcptp.1.42.2022.3698>

Soroka, L. S. (2013). Accounting and Information System in the Management of Economic Security for Various Behavioral Models of the Enterprise. *Accounting and finance*, 1(59), 51–55.

Sosnovska, O., & Zhytar, M. (2018). Financial Architecture as the Base of the Financial Safety of the Enterprise. *Baltic Journal of Economic Studies*, 4, 334–340. <https://doi.org/10.30525/2256-0742/2018-4-4-334-340>

Titenko, Z. (2022). Theoretical Foundations of Financial Security of the Enterprise. *Economy and Society*, (44). <https://doi.org/10.32782/2524-0072/2022-44-76>

Vasylyshin, S., Ulyanchenko, O., Bochulia, T., Gerasimenko, Y., & Gorokh, O. (2021). Improving Analytical Support for Managing the Economic Security of Agricultural Enterprises. *Agricultural and Resource Economics: International Scientific Electronic Journal*, 7(3), 123–141. <https://doi.org/10.51599/are.2021.07.03.08>

Yanioglo, A. (2015). A Complex System of Ensuring the Economic Security of the Enterprise. *Economics of Agriculture and Resources: International Scientific Electronic Journal*, 1(1), 69–79. <https://doi.org/10.51599/are.2015.01.01.07>

Zinchenko, O. A., & Malyshko, U. D. (2016). The Development of Methods for Analyzing the Microenvironment of an Enterprise on the Example of an Institution in the Pharmacy Industry. *European Journal of Management Issues*, 7, 280–286. <https://doi.org/10.15421/191631>

Appendix – Data fragment for calculation

Indicator	2022	2023
Fixed assets	621581	579023
Non-current assets	641608	631931
Stocks	6032	6741
Accounts receivable	23945	32530
Balance currency	676706	680939
Equity	179044	134321
Long-term liabilities	406770	424799
Accounts payable	43426	11076
Current liabilities	90892	121819

Source: author's own study based on LLC "Avtobudcomplex-K".