

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
KYIV NATIONAL UNIVERSITY  
CONSTRUCTION AND ARCHITECTURE**

Faculty of Construction

Department of construction management

*Educational qualification* **Master's degree**  
*level*

*Discipline* **07 "Management and  
administration"**

*Specialty* **073 "Management"**

*Specialization* **"Management of organizations and  
administration"**

**EXPLANATORY NOTE  
TO THE CERTIFICATE GRADUATION WORK  
FOR OBTAINING A MASTER'S DEGREE  
on the subject:**

**„ Directions for updating the construction project preparation system and  
their successful management..„**

**Executed**

**Yan Tao**

**groups 073.Man-23**

***Discipline* 07"Management and  
administration"**

***Specialisth* 073"Management"**

***Specialization* Management of organizations  
and  
administration**

***Head* Associate Professor, Candidate of  
Economic Sciences Petrukha N.M.**

***Reviewer* \_\_\_\_\_**

**Kyiv 2024**

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**  
**KYIV NATIONAL UNIVERSITY OF CONSTRUCTION AND**  
**ARCHITECTURE**

**Constructional faculty**  
Department of construction management  
Educational and qualification level "Master"  
Specialty 073 "Management"

"I APPROVE"

**Dean of the faculty**  
**Ph.D., Professor G.M. Ivanchenko**

" \_\_\_\_ " \_\_\_\_\_ 2024

**T A S K**

For the attestation graduation work of the student

**Yan Tao**

The topic of the work: " **Directions for updating the construction project preparation system and their successful management** and the head of the attestation final work of the Associate Professor, Candidate of Economic Sciences Petrukha N.M. .confirmed by the order of KNUBA from " \_\_\_\_ " \_\_\_\_\_ 2024 No. \_\_\_\_\_

2. **Deadline for submission of work by the student** \_\_\_\_\_
3. **Initial data for work:**  
*Scientific works of domestic and foreign scientists on issues related to modern models and approaches*  
*scientific and methodological principles of administrative management and initial data on the management system of the construction project and the results of the activities of the enterprises-stakeholders of the project; economic, marketing, functional and management characteristics of the project in residential construction*
4. **The content of the settlement and explanatory note - a list of issues that need to be worked out - (consisting of 3 sections):**  
*Chapter 1* –Theoretical and methodological aspects of choosing priorities and directions for updating the system of preparation of construction projects and their successful management.  
*Chapter 2* –The use of simulation and network models as the newest management tools of the pre-investment phase of a construction project in the conditions of overcoming the consequences of crisis phenomena and insufficient information certainty (on the example of the "Britainia Hall" residential complex project).  
*Chapter 3* -
5. **List of graphic material:** 15-17 slides *with a display of research on all sections of the explanatory note to the thesis.*

## 6. Consultants of sections of AVR

Section	Surname, initials and position of the consultant	Signature, date	
		task published	task accepted
Chapter 1	Associate Professor Petrukha N.M		
Section 2	Prof. I.S. Ivakhnenko		
Section 3	Prof. Pokolenko V.O.		
conclusions, literature, graphic part	Associate Professor Petrukha N.M		

## 7. CALENDAR PLAN

No s/p	The name of the stage of the graduation test robots (AVR)	The deadline for writing stages of AVR	Note
1	The student's choice of the AVR topic, submission of an application to the department and coordination with the academic supervisor		
2	Systematization of materials and preparation of initial data for AVR		
3	Approval of the content (plan) of AVR, preparation of an individual task		
4	Preparation of the introduction and section of AVR		
5	Preparation of the II section of AVR		
6	Preparation of Section III of the AVR, conclusions and a list of used sources		
7	Submission by the student of the completed AVR to the research supervisor		
8	Passing qualifying bachelor theses to check for the presence of textual borrowings		
9	Completion of the work, decision-making by the department on the admission of AVR to defense at AEK		
10	Preparation of the presentation (development of options for presenting the content of the research carried out in the AVR, on the sheets of the graphic part) and a report for the defense of the AVR. Agreement with the scientific manager.		
11	Final design and review of the work		
12	Preliminary defense of AVR at the department and its approval by the head of the department		
13	Submission of AVR to AEK		
14	Protection of AVR in AEK and assignment of qualifications to graduates		

8. Issue date of assignment "\_\_\_" \_\_\_\_\_ 2024.

Student \_\_\_\_\_ / Yan Tao /

Head of work \_\_\_\_\_ / Petrukha N.M /

Head of the department

of management in construction \_\_\_\_\_ / Ryzhakova H.M./

<b>RESUME</b> (summary) to the student's attestation graduation thesis:		<b>Yan Tao</b>	
<b>ZVO</b>	<i>Kyiv National University of Construction and Architecture</i>		
Topic	<b>" Directions for updating the construction project preparation system and their successful management "</b>		
Educational level	<b><i>MASTER's degree in the educational and professional study program</i></b>		
Faculty	<i>Constructional</i>		
Chair	<i>Management in construction</i>		
Specialty	<i>Management</i>		
Specialization	<i>Management of organizations and administration</i>		
<b>Head</b>	Associate Professor, Candidate of Economic Sciences Petrukha N.M		
Scope of work:	<b>explanatory note, p.</b>	<b>sections</b>	<b>Visual and graphic part (A4 format sheets)</b>
	<i>124 (with literature and appendices)</i>	<i>3</i>	<i>18</i>
<b>Chapter 1.</b> Theoretical and methodological aspects of choosing priorities and directions for updating the system of preparation of construction projects and their successful management.	<i>The first section of the work reflects the systematization of basic definitions and theoretical and methodological principles of research. processed the work of KNUBA specialists, in particular, teachers and scientists of the Department of Management in Construction, professors Yu.A. Chuprina, V.O. Pokolenko, and associate professors D.O. Prykhodka. and M.V. Horbacha The approaches and analytical tools reflected in the works of these specialists regarding individual stages of the construction and development project have changed the perception of the scope and structure of construction preparation works. As a result, the structuring of the preparation is based on requirements regarding the responsibility of the manager (developer) of the construction project to the customer for the progress of the project and its results. Therefore, the content and topology of the network model of construction preparation is subject to individual stages of the interaction between the lead contractor and the customer.</i>		
<b>Section 2.</b> The use of simulation and network models as the newest management tools of the pre-investment phase of a construction project in the conditions of overcoming the consequences of crisis phenomena and insufficient information certainty (on the example of the "Britannia Hall" residential complex project).	<i>The second section reflects the updated methodological principles</i> The use of simulation and network models as the newest management tools of the pre-investment phase of the construction project. <i>The following scientific and applied analytical preparations were used to justify the decisions of the "Britannia Hall" residential complex project</i> construction project and its administration system in its pre-investment phase: a) network model "Preparation-organization-standard" (developers Prof. V.O. Pokolenko, associate professor M.V. Horbach); b) simulation model "Preparation: stop-risk" (developers Prof. Yu.A. Chupryna and Associate Professor D.O. Prykhodko); c) simulation model "Stop-force majeure" (developers Prof. Pokolenko V.O., Ph.D. Prykhodko D.O.) Together, these models make up a simulation and network toolkit for modeling construction preparation in the development format.The specified models were developed in order to ensure the advancement of the construction organization mechanisms to the advanced, proven by European practice, the foundations of the development of construction projects		
<b>Section 3.</b> Effectiveness of implementation of modern construction	<i>In the third section of the final work</i> modern models of the formalized display of the pre-investment phase of the management cycle were applied to the conditions of the Britannia Hall project management cycle. An economic diagnosis of the investment cycle of the Britannia Hall housing		

preparation models in management practice of the Britannia Hall construction project in Lutsk.	project in Lutsk was conducted. The use of advanced management models of the preparation of construction projects reliably overcome the information uncertainty of the construction project regarding individual characteristics, identify the greatest dangers for the developer and the customer of the project during the preparatory phase of the project.
<b>Conclusions on the work:</b>	<p>Advanced analytical models of construction preparation are applied for the needs of improving the management of the project cycle, in particular, for the justification of economic and management decisions of the construction project Residential complex "Britannia Hall" in Lutsk. The content of the selected models and their algorithmic design should be aimed at overcoming the majority of the risks of the customer and the developer in the pre-investment phase of the construction project.</p> <p>The combination of simulation tools with the advantages of resource-calendar models of the type makes it possible to reliably overcome information uncertainty in crisis conditions, to identify the greatest dangers for the project customer in the preparatory phase of the project, to timely adjust the organizational and technological parameters of the preparatory phase works, and to carry out a more rational distribution of the customer's resources in the final version of the construction preparation .</p>
<p><b>Key words:</b> <i>construction project management cycle, analytical models of construction project preparation, simulation and scenario-stochastic modeling of the project cycle</i></p> <p><b>Keywords:</b> <i>construction project management cycle, analytical models of construction project preparation, simulation and scenario-stochastic modeling of the project cycle</i></p>	

**Compiler:** \_\_\_\_\_ / **Yan Tao** \_\_\_/

**Head:** \_\_\_\_\_/ **Associate Professor, Candidate of Economic Sciences Petrukha N.M** \_/

" \_\_\_\_\_ " \_\_\_\_\_ **2024**

## INTRODUCTION

**Relevance of the topic.** Ensuring the economic security of financial and credit institutions in the modern conditions of economic imbalances, primarily related to the pandemic, is the main goal and difficult task of the modern financial system. For the stable and effective economic development of the country, the activity of financial and credit institutions should primarily be based on the principle of security.

The development of an effective system for ensuring the economic security of financial and credit institutions must be given considerable attention, since the safe operation of the institution is a guarantee of its competitiveness and reliability in the financial sector. This is explained by the fact that institutions seek not only to obtain maximum profits from their activities, but also to minimize the impact of threats on their activities. The use of effective tools and methods of analysis of all aspects of their activity in the system of ensuring the economic security of financial and credit institutions will allow timely detection of threats and minimizing their impact on the economic security of the institution.

Accordingly, taking into account the strategic development plans of a financial and credit institution and the use of predictive models in the analysis of indicators of its economic security will allow comparing the primary tasks of the institution with the probability of the occurrence of certain adverse events. This will make it possible to timely adjust the development strategy of the financial and credit institution and ensure the minimization of the negative impact of threats.

The theoretical and practical foundations of the theories of security science, which are the basis for the formation of economic security at the macro and micro levels, belong to the works of such scientists as: Varnaliy Z.S., Vasylytsiv T.G., Horbulin V.P., Ilyash O.I. , S. V. Kavun, A. B. Kachynskyi, O. P. Koval, G. V. Kozachenko, O. M. Lyashenko, V. P. Martyniuk, I. P. Migus, A. I. Mokii, Momot TV., Shemayeva L. G., Yurkiv N. Ya. and others.

The scientific works of such leading domestic scientists as O.I. Baranovskyi, N.O. Babina, S.V. Vasylychak, N.M. Vnukova, N.I. Havlovska, O.I. Hrytsenko are devoted to the issue of economic security of financial and credit institutions. ., Dombrovskyi V.S., Yegorycheva S.B., Zhuravka O.S., Zachosova N.V., Kovalenko V.V., Kolodizev O.M., Kopytko M.I., Kyrychenko O.A., Krupka, I.M., Melnyk, S.I., Nagaychuk, N.G., Nedilska, L.V., Onyshchenko, V.O., Rudnichenko, E.M., Snishchenko, R.G., Svistun, L.A., Khudoliy, Yu. .S., Tsikanovska N.A., Shteyer O.M., Yavorska T.V., Yaremenko S.M. and others.

Scientific research by leading scientists plays an important role in determining the specifics of the activity and ensuring the economic security of financial and credit institutions. But in the context of the study of this issue, in most scientific works, a significant place is given to the financial component of economic security. Sharing the view that the financial component of the economic security of a financial and credit institution is the main one, we emphasize the need to understand and study the economic security of financial and credit institutions as a set of interrelated components, and not just to start off from the financial component. Therefore, further research requires the definition of theoretical and scientific approaches to understanding the essence of the economic security of financial and credit institutions.

## **SECTION 1**

### **THEORETICAL PRINCIPLES OF ENSURING THE ECONOMIC SECURITY OF FINANCIAL AND CREDIT INSTITUTIONS**

#### **1.1. The essence of economic security of financial and credit institutions**

Ensuring the economic security of the functioning of all economic entities is one of the key tasks, the solution of which guarantees the preservation of national sovereignty. The domestic economy, which has been under the influence of a significant number of negative factors since 2014, is not characterized by sustainable and safe development, which, in turn, causes increased attention to security problems at all levels of the economy in the context of global, geopolitical and internal economic threats. In this regard, the financial sector, which ensures the movement of capital in the national economy, also needs effective methods of management and forecasting, strategic tools aimed at maintaining an adequate level of economic security. Historical experience shows that in the case of effective functioning of financial and credit institutions (hereinafter referred to as financial institutions), a significant economic effect is achieved, which is manifested in the growth of investment resources in the country's economy, satisfying the needs of economic entities in the necessary capital.

The issue of ensuring economic security in the financial sector is complicated by the variety of financial risks generated by the activities of the PKU. It follows from this that the provision of economic security in the financial and credit sphere consists not only in the need for a timely response to problems that have already arisen, but also in the creation of a system of preventive actions aimed at preventing potential threats to financial stability.

Recently, in the financial sector of Ukraine, there has been a tendency to reduce the number of financial and credit institutions, in general, this market

underwent significant transformations at the institutional level. On the one hand, this is evidence that the state cares about the stable development of the financial sector, the formation of quality institutions, exercising the necessary regulatory influence on the functioning of institutions. On the other hand, this situation proves the existence of problems in the field of their economic security, which are not resolved in a timely manner and lead to the liquidation of financial and credit institutions, which, in turn, worsens the economic condition of their depositors and creditors.

According to the Law of Ukraine "On Financial Services and State Regulation of Financial Services Markets" [1], it is customary to define a financial institution as a legal entity that, in accordance with the Law, has the right to provide one or more financial services and other services (operations) that take place in the provision financial services, in those cases that are directly defined by the Law. The institution is entered in the relevant register in accordance with the legally defined procedure. The list of financial institutions should include: banks, insurance companies, credit unions, trust companies, pawnshops, leasing companies, investment funds and companies, accumulative pension institutions and other legal entities that provide exclusively financial services.

The same Law also defines the concept of a credit institution - it is a financial institution that provides financial loans at the expense of borrowed funds, at its own risk, in accordance with the law on the activities of a financial institution. In turn, a financial loan refers to funds loaned to legal entities or individuals, respectively, for a specified period and with interest. Therefore, a credit institution is clearly a type of financial institution, which allows us to reasonably apply the term "financial and credit institution", in addition, we will consider its right to provide credit by lending funds on terms, first of all, maturity and payment, to be a fundamental feature of the FCU.

However, the scientific literature contains other interpretations of the essence of such financial institutions. Yes, in the "Financial Encyclopedia" prepared by

edited by O. P. Orlyuk, a credit institution is defined as a state or private commercial organization authorized to carry out financial transactions in lending, depositing deposits, keeping current accounts, buying and selling currency and securities, providing financial services, etc. [2, p. 215]. It is believed that such a description of the activities of a credit institution is too broad, since calculations and trading of financial assets do not necessarily have to be combined with the conduct of credit activities.

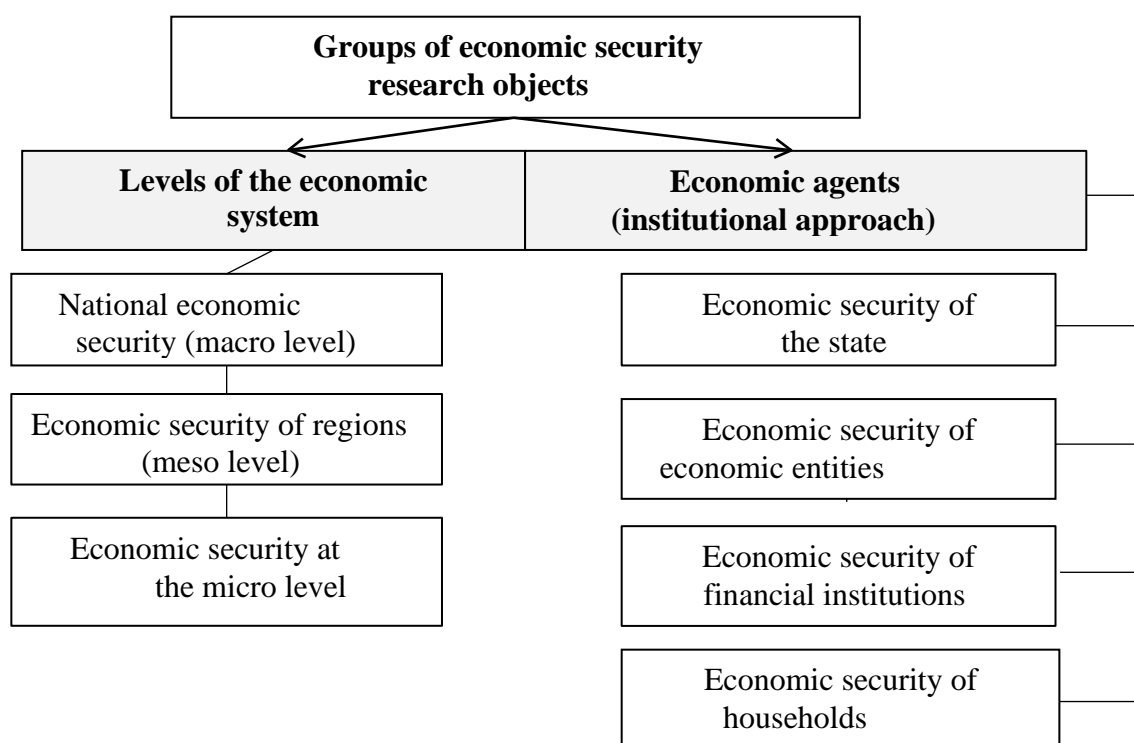
In addition, we fully agree with the opinion of M. E. Khutornaya and N. V. Tkachenko [3, p. 144] regarding the impropriety of assigning to the category of credit institutions only those that work on a commercial basis. After all, then such participants of the financial services market as cooperative banks and credit unions, which actively conduct credit activities, will not be able to be recognized as credit institutions, since they do not aim to make a profit.

Another debatable point, in our opinion, is the narrowing of the sources of formation of FCU resources only to the funds raised, which limits the composition of these institutions to banks and credit unions. The same opinion is held by E. S. Osadchy [4, p. 276-377]. It is believed that in this case, the concepts of financial intermediaries, which should really attract funds, and financial institutions, which provide financial services, are mixed. Therefore, financial and credit institutions should be understood as institutions operating on the market of financial services in accordance with legislation, providing financial loans at their own risk by transforming their own, borrowed and/or borrowed funds, as well as other financial services in order to meet the financial needs of consumers.

The given interpretation of the concept of PKU emphasizes the fact that such an institution is the subject of credit relations and has the right to provide other financial services. For the purposes of our research, we will include banks as well as non-banking entities – credit unions and pawnshops.

Financial and credit institutions carry out risky activities, and therefore the issue of economic security and security of property and resources is a priority for them, as they are responsible to their customers, depositors, creditors and owners. In modern conditions, together with the expansion of technological possibilities of providing financial services, the risks of the operation of the PKU increase proportionally and new types of threats appear, which leads to a weakening of economic security and the need to apply a set of measures to maintain it at the proper level.

It should be noted that the issue of economic security is in the center of attention of many scientific schools and individual scientists. These problems are considered in relation to different levels and subjects of the national economy (Fig. 1.1).



Rice. 1.1. Groups of research objects that form the basis of the interpretation of the concept of "economic security"

Source: compiled by the author

The economic security of the national economy is generally defined as its state that ensures resistance to external and internal threats,

a high level of competitiveness in the world economic arena is ensured and the potential of the national economy for sustainable and balanced development is preserved [5, p. 186]. So, economic security as a concept reflects a certain state of its object. In our opinion, we can single out the two most important signs of economic security: stability and progressive development. They are basic for determining the essence of economic security of all other economic agents. As a scientific category, economic security acts as a system of economic relations between certain subjects in order to ensure the conditions for the functioning and development of objects of economic security.

The study of significant scientific work in the field of economic security research allows us to make certain theoretical assumptions. First of all, security cannot be absolute, exclude the existence of challenges, dangers and threats as such. In addition, security is a necessary form of functioning of the object in the environment, which also creates threats. Finally, ensuring security is always about detecting, protecting against, and countering threats.

In our opinion, the study of the problems of economic security of the PKU should be based on a systemic approach to the essence of financial and credit institutions. First, they are socio-economic systems, as they receive both economic and social results, on which their further development depends, and are also affected by both economic and social factors. Secondly, they are open systems, as they constantly exchange financial resources and information with the external environment. Thirdly, financial and credit institutions are non-linear systems: external shocks cause destructive effects that can spread within them unpredictably and cumulatively, even minor influences can significantly change the nature of the institution's functioning. Finally, PKUs are dissipative systems that are in a state of dynamic equilibrium, that is, they constantly lose it and restore it due to self-organization, passing from an unstable state to a stable one. Accordingly, the processes of maintaining the existing economic security

consistent with the concepts of balance, stability, and stability, should be based on an understanding of the systemic essence of financial and credit institutions.

Modern ideas about the economic security of financial and credit institutions reflect the general level of research on security issues in all spheres of the economy. Undoubtedly, this concept is complex and multifaceted, therefore its definitions, which are available in the domestic literature, differ in a significant variety. Scientists, studying this issue, try to reflect as fully as possible all aspects of the processes of achieving and maintaining the economic security of the PKU.

However, it is worth paying attention to the fact that the main object within this direction of research remains commercial banks as such, which form the basis of the financial sector of Ukraine and which account for the majority of assets, volumes of operations and clients served. Only some scientists, including N.O. Babina, N.V. Zachosova [6,7,8] N.I. Havlovska, E.M. Rudnichenko [9], R.G. Snishchenko [10] consider economic security more comprehensively – in relation to financial institutions (or financial intermediaries, or financial market participants). In addition, some authors objectively study the security issues of specific types of financial institutions: insurance companies - N. G. Nagaichuk [11], T. V. Yavorska [12]; credit unions - O. I. Hrytsenko [13], S. B. Yegorycheva [14], non-state pension funds - N. A. Tsikanovska [15], pawnbrokers - N. M. Vnukova [16], L. V. Nedilska. [17]. Their findings are extremely important for our research.

At the same time, it should be noted that the range of problems investigated by domestic scientists is outlined by them with different concepts - security, financial security, economic security, financial and economic security, which requires the establishment of a certain subordination between these terms. Undoubtedly, the broadest concept is security, which, according to the explanatory dictionary, is a state in which nothing threatens anyone or anything [18, p. 83]. Such a condition of a financial and credit institution (in particular, a bank) is ensured not only by economic conditions

activities, as well as purposeful actions in such areas as combating fraud and abuse of office, raiding and terrorism; prevention of unfair competition and industrial espionage; ensuring physical protection of property and personnel; guaranteeing continuous activity of the PKU in crisis situations, etc. [19, p. 254].

Extremely often, authors in relation to financial and credit institutions focus their attention on the concept of "financial security", actually equating it with economic security. On the one hand, this seems legitimate, since the main type of activity of financial institutions, unlike other business entities, is financial activity, and it is this that determines certain results of the functioning of the institution, which is the basis of ensuring security, and generates the corresponding risks and threats. On the other hand, only financial processes, in our opinion, cannot fully guarantee the economic security of FKU from various types of threats. A significant role should be played here by other components of activities - personnel, technical and technological, information, compliance, etc., which in the complex form the content of the economic security of a financial and credit institution, i.e. maximum protection of its economic interests.

It is worth noting that economic interest means the determined desire of business entities to satisfy economic needs, which is an objective motivating motive for their economic activity. In the formation and development of economic entities, economic interests are the driving force [20, p. 48]. On the other hand, economic interests are appropriate actions and goals aimed at satisfying needs. Therefore, factors and events that contain a threat to the realization of economic interests, in the absence of an adequate reaction to them and neutralization, can be an instrument of blocking for financial and credit institutions the satisfaction of economic needs arising from their essence: the implementation of activities for the provision of financial services in order to receive income, increase

operational efficiency, availability of sufficient resources, increasing competitiveness, ensuring stable development, etc.

Finally, we believe that the concept of "financial and economic security" is a bit of a compromise, taking into account the fact that while focusing on a more comprehensive definition of "economic", at the same time it emphasizes the main field of activity of financial and credit institutions - financial.

Studying the works of domestic scientists [21; 22; 23; 24; 25; 26;27] allows us to formulate the main goal of economic security of a financial and credit institution - ensuring its continuous, stable and effective functioning with the possibility of rapid adaptation to changes in the internal and external environment, predicting and preventing possible threats and forming the potential for future sustainable development.

Some interpretations by modern scientists of the essence of the economic security of the PKU in chronological order of the appearance of publications are given in table A.1 (appendix A). As we can see, the vast majority of them refer, as we mentioned earlier, to the functioning of banks, although the main points can be generalized to the level of all types of financial and credit institutions. There is also a certain number of review articles in the domestic scientific literature, in particular, [43;49], in which these definitions are thoroughly analyzed and evaluated. However, in our opinion, attempts to find a "universal", "unified", "generally accepted" definition of the economic security of the PKU are not promising. Each definition is proposed by scientists in a certain context, serves to build a certain theoretical model and is necessary and reliable within its limits. In one form or another, most authors include the following elements in the content of economic (financial and economic) security of financial institutions: ensuring the best use of resources, creating conditions for efficient, stable functioning and maximum profitability of activities; protection of vital interests of the financial institution, interests of owners, managers, staff and clients; the ability to resist destructive actions and

threats and to provide survival in competitive environment; state, necessary and sufficient to realize the goals of functioning and sustainable development.

As a result, several aspects of the concept of "economic security of a financial and credit institution", which, in our opinion, do not contradict, but complement each other (Fig. 1.2).

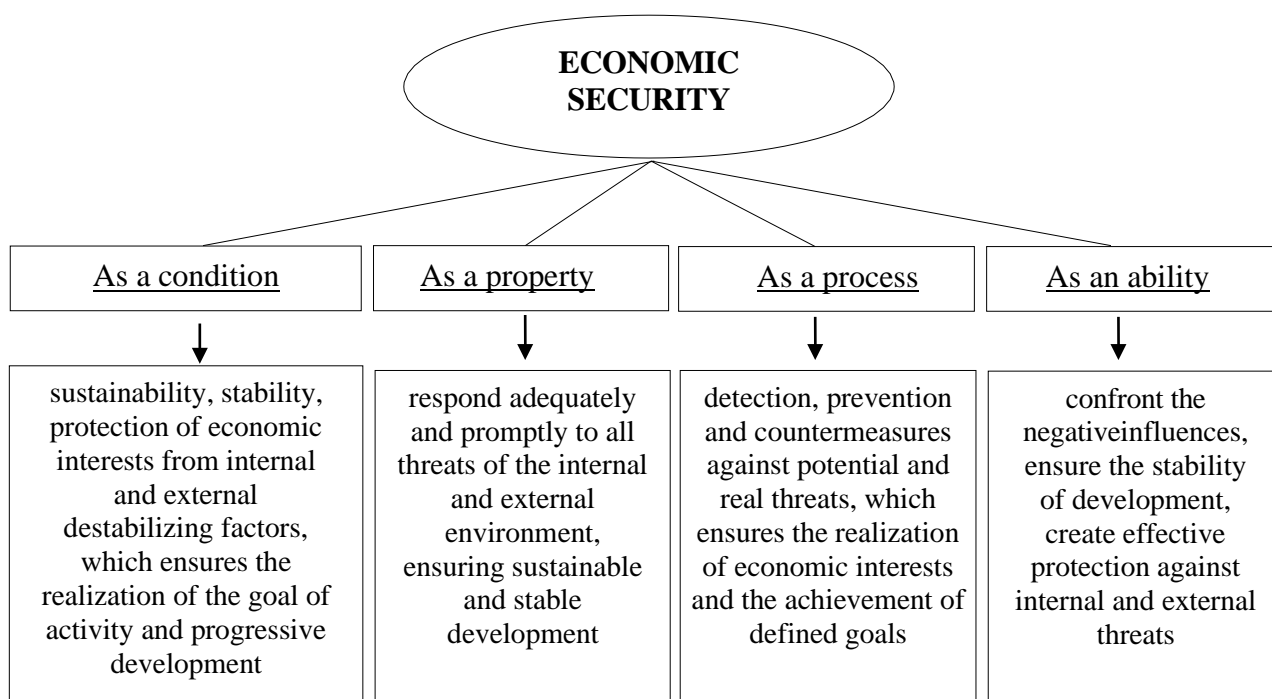


Fig. 1.2. Aspects of interpretation of economic security of financial and credit institutions

Source: author's development

The analysis of the definitions given in table A.1 (Appendix A) also leads to the conclusion that scientists use several methodological approaches when determining the essence of the economic security of FCU. From a sufficiently wide list of them offered by modern economic security [50, p. 480], we can single out exactly those that are used by scientists in the field of our research:

- resource approach, which connects economic security with the sufficiency of various types of resources (financial, material, technological, informational, personnel, etc.) required for the full functioning of the FCU, and the efficiency of their use. Without denying the extraordinary

the importance of having an appropriate material basis for ensuring economic security, we note that, in our opinion, the use of only such an approach does not provide a comprehensive idea of the content of economic security and ways of achieving it;

- an approach from the standpoint of stability, which reflects the ability of financial and credit institutions as open, non-linear, self-organizing systems to counteract the negative impact of external and internal threats, to withstand external shocks without disturbing the balance and stopping progressive development, to ensure continuous activity in crisis situations. This approach corresponds to the interpretation of economic security as a certain state of the PKU and is widely used in theoretical and empirical research;

- a process approach that equates economic security with the process of ensuring it, a set (system) of measures to achieve and maintain it. In this regard, we note that given the instability of the environment in which financial and credit institutions operate, their security in itself should be perceived as a dynamic phenomenon, acting as a flexible response to changes in the level and composition of threats that exist at any particular moment in time;

- a competitive approach, in which attention is focused on ensuring competitive advantages and survival in a competitive environment, which, in our opinion, in today's extremely complex and ambiguous business conditions, is too narrow a view of the issue of economic security of financial and credit institutions;

- a protective approach that forms the concept of economic security through the protection of the economic interests of financial and credit institutions against threats from the external and internal environment, which contributes to the preservation of their internal properties and successful functioning. It is believed that such an approach is able to fully reflect the essential characteristics of economic security. Security in this situation can be interpreted as a specific activity to detect and neutralize dangers and threats.

In addition, new and promising, in our opinion, is the approach according to which economic security is considered in relation to development - as a prerequisite for development and as such, which is provided by development. In this case, its guarantee is based on the processes of prevention and management, it is ensured to a greater extent not by means of protection, but by the effective implementation of the sustainable development strategy.

Therefore, according to the author's definition, the economic security of financial and credit institutions is a prerequisite for development, which ensures stable activity, protection of economic interests, resources, legal rights, and the ability to resist external and internal threats.

As for our vision of the researched issues, we support N.V. Zachosova's opinion that the specifics of various financial and credit institutions do not allow us to form a unified understanding of the essence of their economic security [51, p. 20-21]. We believe that it is extremely important to take into account the specific features of their creation and functioning.

Banks are the most powerful and diverse financial and credit institutions in the domestic financial market in terms of their spheres of activity. In accordance with the legislation, a bank is defined as a legal entity that provides banking services exclusively on the basis of a bank license. Banking services include: attraction of an unlimited number of legal entities/individuals in deposits (deposits) of funds and bankable metals; opening and maintaining current (correspondent) accounts of clients; placement of bank metals and funds involved in deposits (deposits), including current accounts, on one's own behalf, at one's own risk and according to one's own conditions [52].

Banks can be created in the form of a joint-stock company or a cooperative bank, however, the second organizational form has not yet been used in practice in Ukraine. Therefore, the economic interests of the bank as a financial and credit institution are complemented by a complex and contradictory set of group interests of owners (shareholders), management and employees. From this

point of view, the economic security of the bank can be defined as a state of protection of its economic interests, in harmony with the interests of all groups of internal stakeholders, which consist in ensuring stable and effective development based on the most complete use of its economic potential and timely detection, prevention and neutralization of threats to its activity .

A credit union is defined as a non-profit organization founded by individuals, trade unions or their associations, which carries out its activities on a cooperative basis. The main goal is to satisfy the needs of the members of the credit union in mutual lending and provision of financial services at the expense of joint monetary contributions [53]. The main types of financial activity of credit unions are: acceptance of introductory and mandatory share and other contributions of union members; providing loans to its members on terms of payment, term and security; attraction of its members' contributions to deposit accounts on contractual terms.

The essential characteristics of a credit union are cooperative principles of activity, the identity of owners and clients and, accordingly, the commonality of their economic interests, non-profit nature, when the activity is not carried out for the purpose of obtaining income, but for the purpose of mutual assistance [54, p. 121-122], determine the potential minimization of internal threats to economic security and contribute to the stability of the credit union's functioning. Therefore, in our opinion, the economic security of a credit union can be defined as the state of protection of the economic interests of its owners-clients, which consist in the most complete and effective satisfaction of their financial needs, based on the prevention and neutralization of threats in the process of stable development based on the observance of cooperative principles of activity .

A pawnbroker is a financial institution whose exclusive right is to provide financial loans to individuals. Lending is carried out at the expense of own or borrowed funds, at the institution's own risk, subject to the mandatory availability of collateral, with specified

terms and the corresponding interest fee. A pawnshop can provide related services that are a prerequisite for granting a financial loan or derive from it [55]. Pawn shops are allowed to attract only those funds that have been received on a reverse basis from customers. It is prohibited to carry out any other entrepreneurial activities, except those provided for them by the legislation. Practice shows that pawnshops are, as a rule, small in size, have a simple organizational structure and conduct sufficiently standardized activities, the key to success of which is the qualification and high moral qualities of the staff, as well as the reliable preservation of the values provided as collateral. To ensure the latter, pawnshops must have their own accounting and registration systems, carry out collateral insurance, in addition, they are prohibited from being located in small architectural forms, temporary or non-capital structures.

Based on the specified features of pawnshop activity, the economic security of these financial and credit institutions can be defined as the state of protection of their economic interests, which consist in profitable activity based on the sufficiency of resources and the prevention of internal and external threats, as well as the undisputed preservation of the material form and value of the pledged property .

Economic security of financial and credit institutions, as already noted earlier, is a complex concept that combines several elements, each of which contributes to the stability of the development of the financial institution. Some views of domestic scientists on the components of economic security of financial and credit institutions are presented in Table 1.1.

We support the scientific approach of the above-mentioned authors regarding the consideration of the components of economic security in terms of ensuring the activities of financial and credit institutions. However, there is another point of view - structuring the economic security of the institution into types of security for the implementation of certain operations or the provision of services (security of credit operations, deposit operations, payment and settlement operations, etc.). It is thought that this is another "plane" of research

economic security, when the above-mentioned components are used to secure certain spheres of operational activity of financial institutions. In particular, with regard to credit operations: provision of this area with appropriately qualified personnel, obtaining and analyzing information on the borrower's creditworthiness, compliance with the legal principles of drawing up a credit agreement, checking the quality of material collateral, forming financial parameters of the credit operation, etc.

Table 1.1

Systematization of scientists' views on the components of economic security  
financial and credit institutions

Constituents	Vorobyov I. A., Riznyk N.S. [5, p. 186]	Zachosov a N.V. [5, p. 241]	Melnyk S.I. [56, p. 151]	Steyer O.M. [57, pp. 102-103]	Havlovska N.I., Rudnichenko E. M. [49, p. 233]	Yaremenko S.M. [35, p. 143-144]
Financial	+	+	+	+	+	+
Informational	+	+	+	+	+	+
Technical and technological		+		+	+	
Personnel (intellectual personnel)	+	+	+	+	+	+
Legal	+	+		+	+	
Rynkova	+	+		+	+	
Interface				+		
Material (property)		+	+			+
Physical (strength)		+	+	+	+	

Source: compiled by the author based on the specified sources

As can be seen from the table. 1.1, most authors agree with the existence of financial, informational, technical and technological, personnel, legal, market and physical (power) components of economic security. The financial component is responsible for the provision of FKU with financial resources, the level of their use, directions of placement. It is embodied in the competent management of financial risks and cash flows to ensure the optimal ratio of profitability, riskiness and liquidity. Financial stability is the basis of economic security of a financial and credit institution.

The informational component of economic security includes, first of all, effective information and analytical support for the implementation of all business processes of a financial and credit institution, as well as the preservation of banking/commercial secrecy affecting all employees of the FCU. It is achieved by creating in the institution a system of collecting, processing and storing information, rules of access to it and its use, compliance with the rules of working with information, timely detection of attempts and possible channels of information leakage. The field of information security also includes issues of relevance, availability and reliability of information disseminated about the financial and credit institution in the media environment.

In modern conditions, such an element of information security as cyber security becomes especially important, taking into account the fact that the activity of financial and credit institutions, especially banks, is based on the use of computer technologies and is related to the preservation of huge amounts of information. Cyberattacks, hacking and digital espionage, as evidenced by already available experience, can cause irreparable damage to the functioning of the PKU [58, p. 86].

Cyber security is about maintaining the confidentiality, integrity and availability of information. The security of information resources and channels for receiving and transmitting information, computer systems and electronic communication networks in a financial and credit institution ensures the integrity and availability of information. All data about the provided services, money transfers, received analytical data or confidential information about customers and employees of the financial and credit institution is stored on electronic network servers. The importance of ensuring an appropriate level of cyber security is not only to protect information but to preserve finances, which is of course the main aspect. The "leak" of information about customers and employees causes irreparable damage to the image of a financial and credit institution. This can cause the loss of potential and existing customers, because a financial and credit institution that is unable to ensure its information security is not reliable.

The studied scientific works [59; 60] show that an important aspect in the matter of ensuring the cyber security of the FCU is not only protection from external illegal encroachments, but also from internal aspects. Communication between departments of a financial and credit institution is carried out through information networks, therefore licensed means of network protection, antivirus programs and attentiveness of employees during operations are of no less importance.

The technical and technological component of safety includes the stability of work processes, a sufficient level of technical equipment of the institution, the proper operation of technological resources, and the availability of modern technical safety equipment.

Such a component of their economic security as personnel is of particular importance for financial and credit institutions. First of all, because a certain part of employees constantly deals with highly liquid assets (cash, securities), erroneous or criminal actions with which lead to significant losses. In addition, FCUs are service organizations, i.e. those that work in the field of providing financial services, therefore the quality of personnel is a decisive factor in establishing relations with clients and expanding the scope of activities. Since there is a system of delegation of authority in financial organizations, the qualification of employees is extremely important from the point of view of making optimal decisions regarding the expediency and riskiness of operations. Finally, employees of financial and credit institutions have significant volumes of confidential data, have access to various software services, therefore their high moral qualities should be a guarantee of preventing fraud and information leakage.

Therefore, personnel safety should be considered as a set of measures to prevent risks related to personnel, their intellectual potential and moral qualities, and labor relations in general. It covers the processes of personnel selection, risk assessment of the activities of already working employees, and minimization of risks from their illegal actions.

Personnel security of a financial and credit institution is aimed at minimizing internal threats to its activity generated by its own personnel. Such threats include: unqualified management, errors in management decision-making, insufficient qualification of personnel, disclosure or use of confidential information for one's own purposes, irresponsibility, corruption, fraud, criminal activity, etc. All these threats, in the case of their implementation, are able to have a significant negative impact on the financial results, reputation and, in general, prospects of the existence of a financial and credit institution. Therefore, protection should be active, based on the prevention of dangerous events.

Legal (legal) security includes compliance with current legislation in relations with regulatory and other state bodies, counterparties, clients, staff, comprehensive legal support for the activities of a financial and credit institution, as well as the implementation of internal regulatory documents that determine the organization of business processes, duties, powers and responsibilities of employees and members of executive bodies.

Without denying the extreme importance of the legal component of the economic security of financial and credit institutions, we believe that in modern conditions it is worth expanding its content and interpreting it as compliance-security.

Compliance means ensuring the organization of activities, in particular, the bank's compliance with the requirements of the current legislation of Ukraine, regulations and legal acts of the National Bank, internal bank documents, market standards and standards of professional associations [61]. At the same time, financial and credit institutions pay special attention to compliance with countermeasures standards and prevention of legalization of illegally obtained income, financing of proliferation of weapons of mass destruction and terrorism. In modern conditions, the content of compliance is supplemented by such important components as security

compliance with the requirements of corporate ethics and settlement of conflict of interest situations and prevention of their abuse.

In our opinion, the interpretation of such components of economic security as material and physical (force) are closely related, so they should be combined into one - material and force. It consists in ensuring the physical safety of the employees of the financial and credit institution, first of all, managers, their protection from threats to life, health and well-being, as well as the preservation of the property of the financial institution, protecting it from criminal encroachments.

The market component of the economic security of the FCU, according to the definitions of scientists, is related to the model of market behavior of the institution, competitive strategy, pricing policy, choice of service delivery channels, innovation strategy. It reflects the growth of competition in the financial market, the weakening of the financial and credit institution's competitive positions and ability to resist competitive pressure, and the reduction of its adaptive capabilities. All these problems are related to the marketing function of management, therefore, in our opinion, it is more appropriate to call the above-mentioned component marketing. Its content should also include aspects that O. M. Steyer, in particular, calls the interface component. The concept of "interface" (English interface - place of contact) should be understood as a suitable set of tools, when using which two systems interact. So, the interface component characterizes the reliability of the FCU's interaction with economic counterparties, first of all, customers, which is also the content of marketing activities. Preserving and strengthening customer trust is one of the cornerstones of ensuring the economic security of financial and credit institutions.

In addition to the above, we suggest highlighting one more component of the economic security of the PKU, which is becoming relevant in today's conditions of global aggravation of problems with energy resources - energy security. Financial and credit institutions, especially large ones, are significant consumers of energy resources, primarily electricity, without the use of which practically no technological activity can be carried out.

process. A constant increase in the cost of energy carriers, a possible decrease in their quality, supply interruptions pose a serious threat to the continuity of the PKU's activities, mean an increase in costs, a potential possibility of information loss, and therefore reduce the level of economic security.

The author's vision of the components of economic security of financial and credit institutions is shown in fig. 1.3.

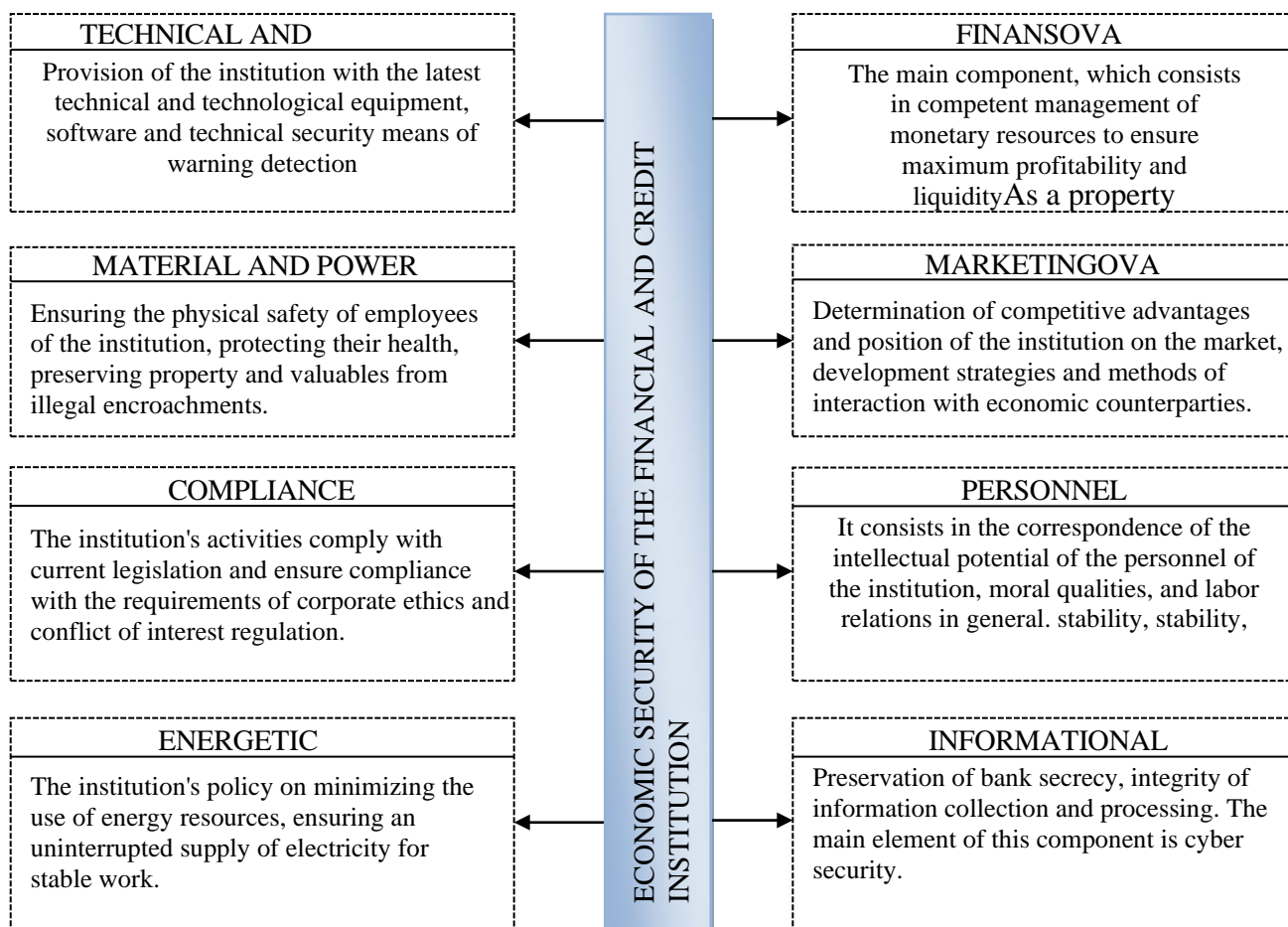


Figure 1.3. Components of economic security of a financial and credit institution

Source: author's development

Thus, the development of scientific approaches to the interpretation of the essence of economic security of financial and credit institutions and the identification of the content of its components allows, in our opinion, to more reasonably determine the strategic directions of ensuring and increasing economic security. This will be facilitated by the systematization of theoretical ideas regarding the identification of threats to the economic security of financial and credit institutions.

## **1.2. Scientific approaches to the identification of threats to the economic security of financial and credit institutions**

In the process of considering the essence of the security of financial and credit institutions from the position of a protective approach, threats are the main, initial concepts as certain processes and phenomena that occur in the external and internal environments, as well as the actions of other subjects, which under certain conditions can negatively affect the activity these institutions. Since the operating environment of organizations is formed as a result of efforts to realize a large number of economic interests of various subjects, in addition, there are numerous objective circumstances that may be unfavorable - natural, technical-technological, informational factors, etc., various threats arise and act constantly, determining the need to achieve and maintain a state of security.

The economic security of financial and credit institutions ensures their resistance to identified threats, characterizes the ability to self-reproduce and self-organize to ensure the satisfaction of the needs of external and internal stakeholders. In our opinion, guaranteeing security is precisely in detecting threats, countering them, neutralizing them, and, if possible, eliminating them. Competent countermeasures can only be made against what has been recognized and studied. This determines the importance of identifying threats to the economic security of financial and credit institutions.

In addition, despite the fact that threats exist constantly, their composition and intensity of impact change periodically. In particular, domestic financial and credit institutions are currently facing such types of threats that could not have been predicted even hypothetically a few years ago. Accordingly, new types of risks appear, and traditional ones become more intense. The relevance of these issues requires paying attention to the essence of threats, identifying their classification features and sources of occurrence.

The concept of threat has been the object of study of domestic security for a long enough time and is quite often found in scientific works

using the concepts of risk, danger and threat. Despite this, there is still a wide range of points of view in scientific circles regarding the definition of the essence of these concepts. Some of them are presented in the table. B.1 (Appendix B). A correct understanding of these concepts allows you to form an appropriate reaction to them and, first of all, this concerns the effectiveness of ensuring economic security.

The analysis of the given interpretations shows that almost every one of them reflects the danger of inflicting or causing certain damage to the subject, creating obstacles in the realization of his interests, achieving his goals and ascertained negative impact on stable activity. Summarizing, we can say that security threats are actually any internal or external conditions and factors that have a negative impact on the development process and require a reduction in their quantitative or change (mitigation) of their qualitative characteristics in order to restore it. At the same time, according to Z. S. Varnaly, the most common signs of threats are concreteness, reality, validity, creation of economic danger [25, p. 64].

However, it is worth paying attention to a certain relativity of threat characteristics. The same events or factors in one case (for one subject) can be favorable, and under other conditions (for another subject) - not at all. Thus, the strengthening of the national currency poses a threat to the economic interests of exporters, means for them not to achieve the planned financial result, at the same time it is favorable for importers, and also reduces the currency equivalent of the state debt, which positively affects the state's debt security. In addition, what in the short term appears to be a danger, a threat - for example, increased competition in the financial market due to the appearance of FinTech companies - can be seen as a positive opportunity in the long term - a way of innovative development of financial and credit institutions through the creation of strategic alliances with them.

Studying the scientific literature on security issues, one can find many points of view of scientists on the essence and content of economic security at the level of a business entity/financial and credit institution. Some of them are listed in table. B.2

(Appendix B). We agree with G.V. Kozachenko. and Yu.S. Pogorelov, that the lack of a clear definition of the meaning of the concept of "threat" provokes the emergence of a false comparison of the consequences of the realization of threats and threats as such, which leads to errors in the definition of vectors and benchmarks of security activities of the economic entity [81, p. 163-164].

As a result of the analysis of the given definitions, it can be said that the interpretation of security threats for economic entities offered by I.P. Migus [76] and Orlyk O.V. [80, p. 251], is somewhat generalized, as they do not contain clarifications regarding the content of the events taking place and the nature of their impact on the activity of the subject, which is decisive in the process of operational identification of threats.

In our opinion, most of the processes and phenomena in the external environment of financial and credit institutions, which are the result of the activities of a large number of subjects who pursue their interests, in particular, macroeconomic processes, are by their nature indifferent to the functioning of the FCU and cannot be clearly seen as threats or enabling factors. And only a certain internal state of the FCU, the peculiarities of its resource base, assets, business processes, technical support, personnel, etc., forces us to identify certain of them as threats. When the characteristics of the state of the institution change, such events or phenomena may lose their threatening character.

Using the previous example with the change in the exchange rate of the national currency, we can state that the devaluation of the hryvnia during the financial crisis of 2008-2009 became a threat to the activities of most domestic banks that had a portfolio of foreign currency mortgage loans, as it significantly reduced the solvency of borrowers. In order to prevent such situations in the future, in the middle of 2009, at the legislative level in Ukraine, it was prohibited to issue all types of foreign currency loans to individuals (hence, there was a change in the state of assets). The same banks that at the beginning of the crisis had a large long position in foreign currencies, on the contrary, received additional profits due to the growth of their exchange rate.

Another matter is the deliberate actions of the subjects of the external environment, which have direct or indirect interaction with financial and credit institutions, and therefore influence their activities (the state, regulators, competitors, partners, clients, etc.). Here, the source of threats can be not only such direct aggressive actions as an attempted raider capture or an information attack, but also objective disagreements between the economic interests of these subjects and the FKU.

As for the internal environment of financial and credit institutions, here the source of threats is mainly unqualified management, as well as intentional and unintentional actions of personnel.

Most scholars characterize the threat as an actual or potential event, which is certainly appropriate. The specificity of threats to the economic security of a financial and credit institution is precisely that the phenomena of the external and internal environment can be both real, which are realized with a certain probability, and potential, which do not occur in reality (in particular: rumors about the merger or acquisition of institutions; consideration a draft law containing the strengthening of activity norms or the prohibition of certain activities; predictions of analysts regarding the dynamics of macroeconomic processes, etc.), but they provoke panic, volatility in the financial market and also lead to certain negative consequences, even without being implemented. Distinguishing these sources of threats is of practical importance, since the measures applied to counter them and to neutralize them must be somewhat different.

In our opinion, one of the difficulties associated with the neutralization of threats, the development of effective protective measures, is the diverse manifestation of their essence. Almost any element outside or inside the organization, from the point of view of ensuring economic security, can act in different roles:

- the subject (means, method, tool) of ensuring security;
- object of ensuring economic security (element to be protected);
- the source (subject or object) of the threat.

At the same time, the elements here can mean any objects, animate and inanimate, material and immaterial, in particular, the personnel of a division of the

institution, individual employee, funds, contract, client, settlement document, transaction, business process, etc.

It is especially important to focus on the negative nature of the impact of the specified actions or events on the financial and credit institution, primarily due to the impossibility of realizing its economic interests, causing financial losses or material damage, loss of capital. However, we support the opinions of N. O. Grebenyuk. [85, p. 56] and Zubka M.I. [86, p. 18] that non-financial or image-related, moral consequences can be no less devastating for PKU: a decrease in reputation, loss of customers, dismissal of leading employees, malfunctions of information systems, etc., which over time are also reflected in financial results.

The generalization of the approaches of scientists to the concept of "threat" made it possible to form the following definition of it: a threat to the economic security of a financial and credit institution should be understood as such phenomena, processes or actions/inactions that occur in the external and internal environment of its activity and directly or indirectly increase the probability of disrupting the stable functioning of the FCU, its failure to achieve its goals due to the infliction of any type of damage on the financial and credit institution.

According to the provisions of modern safety science, concepts such as "danger" and "risk" are related to the concept of threat. A number of scientific publications [76; 87; 71; 73; 88; 85] were devoted to the analysis of the relationship of these terms, based on various interpretations of their essence, the study of which allowed us to make the following generalizations.

Regarding the concept of "danger", there are at least three points of view on its content in the literature:

- danger, based on the etymology of this word, is interpreted as a situation opposite to security, that is, as a lack of security; therefore, they are opposite in meaning: the state of insecurity of the subject's interests and, accordingly, the state of protection;

- danger is considered as a potential threat, the stage of the emergence of the latter, as a certain negative situation that does not cause harm in itself. Danger acquires a negative manifestation under the appropriate conditions, under which it transforms into a threat and acquires a message for negative action [86, p. 17]; therefore, the threat is interpreted as the stage of transition of danger from the status of "possibility" to the status of "actuality";

- danger is considered a specific, higher form of manifestation of a threat, when the destructive influence of the latter on the activity of an economic entity begins to be observed; thus, the situation becomes dangerous when the threat acquires real forms of manifestation.

It is the last point of view that seems to us to be the most acceptable, as it reflects the real dynamics of the process, the movement from safety to danger due to increased threats to the activity of an economic entity.

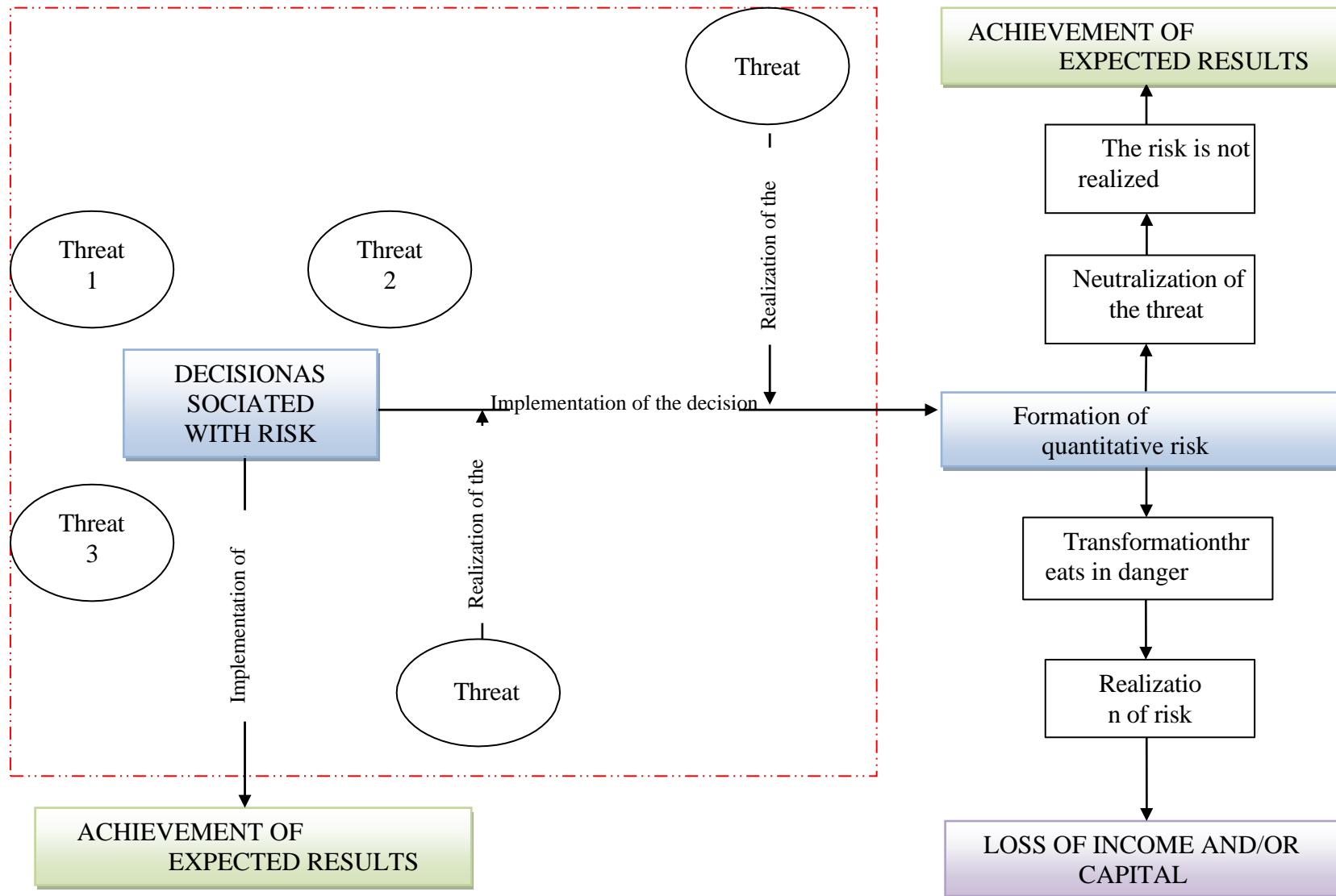
Regarding the understanding of the concept of "risk", there are also a large number of different approaches. We agree that risk is an objective characteristic of the activity of any business entity, which is inherent in any management decision in conditions of uncertainty. According to this understanding, risk is measured by the probability of not receiving expected results. In this case, it means the probability of missing out on benefits, material or financial losses, failure to receive profit. The immanence of such a feature as riskiness in commercial activity is emphasized even by the legislative definition of entrepreneurship as an independent, systematic, at-your-own-risk activity. Similarly, in relation to banks, one of their basic operations consists in placing funds involved in deposits on their own behalf, at their own risk and on their own terms. Therefore, risk is a form of functioning of business entities in a dynamic, probabilistic environment.

The uncertainty of the environment consists precisely in the presence of destabilizing factors, threats, dangers that may not manifest or act more or less intensively. If they did not affect a certain process or operation, then the risk is not realized and the results expected by the subject are achieved: favorable conditions

allow you to achieve your goals and make a profit. And vice versa, the influence of a threat is a risky situation that began to be realized according to an undesirable option.

So, it can be noted that the threats exist objectively, and the risk makes it possible to provide an assessment of the degree of influence of the threat on the state and results of the activity of the financial and credit institution. If a threat is a probable possibility of an obstacle to the economic interests of the FCU, then the risk, in turn, is the level of this threat and gives a mathematical representation of the expression of the possibility of the occurrence of obstacles. These considerations can be illustrated using the example of an operation common to all the investigated financial and credit institutions - issuing a loan to an individual. When granting a loan, PKU incurs a credit risk, which consists in the possibility of partial or complete non-repayment of the loan and non-payment of interest. The implementation of a negative scenario depends on the fact of the transition of threats that are, in general, known (a decrease in the borrower's solvency, a significant deterioration in his health, fraud attempts, a decrease in the value of the collateral, etc.) from a potential state to a real one (in particular, as a result of the borrower losing his job). Therefore, the probability of financial losses of the PKU increases, but it can be minimized by neutralizing the threat (indirectly - by the borrower receiving unemployment benefits, or directly - by selling the collateral). And only when the threat increases to the level of danger (there is no income, the collateral is lost) the credit risk is fully realized, the loan turns into a non-working, problematic state, which causes the need to form reserves and reduces the capital of the financial and credit institution. If the threats are not realized, the risk does not manifest itself, and the PKU receives the expected financial results.

Our understanding of the relationship between the concepts of "threat", "security", and "risk" is visualized in fig. 1.4.



Rice. 1.4. Interrelationship of threats, dangers and risks in the activity of financial and credit institutions

Source: compiled by the author

The process of ensuring the economic security of financial and credit institutions begins precisely with the identification of threats to their stable functioning. Identification (from Latin *identicus* – identical), according to the dictionary of foreign words, means identification, equating, assimilation, that is, establishing the identity of a certain object with a known one based on the coincidence of features. The term "diagnosis" (from the Greek. *diagnosis* - recognition) has an almost similar meaning. The main tasks of identification (diagnosis) of threats to economic security are their timely detection, investigation of the nature and direction of influence on the economic interests of the financial and credit institution, assessment of the probability of realization and prevention of potential crisis situations.

Various methods are used for identification, which fall into the following four classifications:

1. Methods of expert assessments, which are described in sufficient detail in the literature [89]. Let's just remind that these methods are divided into two large groups: individual (personal) expert evaluations, which involve obtaining opinions from individual experts isolated from each other, and group (collective) evaluations, when the evaluations of experts are connected in a certain way. The forms of conducting individual examinations are an interview and an analytical note, and the methods of collective examinations are the commission method and the Delphi method. Experts in the situation of identification of threats to economic security are leading employees of the financial and credit institution, as well as external specialists. The main requirements for them are a high level of qualification, competence, indifference to the result, psychological independence.

2. Economic and statistical methods consist in the analysis of statistical data while ensuring the economic security of the PKU. These methods are used to monitor the external and internal environment, assess the impact of threats, and select the most significant ones among them. These include the correlation method, regression analysis, index method, etc.

3. Mathematical methods are the study of economic processes using mathematical models. It is clear that their application requires

highly qualified and experienced specialists, therefore it is advisable only in commercial banks. Such methods include the theory of games, the theory of fuzzy sets, optimization methods, the method of hierarchies, etc.

4. Economic methods, which are methods of researching economic indicators, processes and systems inextricably linked with each other. They are used, in particular, to estimate the amount of losses that a financial and credit institution can receive as a result of the threat's realization. Such diagnostic methods include: trend analysis, factor analysis, coefficient method and others. To identify threats, it is also worth using well-known methods of strategic analysis: SWOT-analysis, PEST-analysis, SNW (abbreviation from the English strength, neutral, weakness) - for analyzing the internal environment of the PKU [84, p. 140-146].

From the point of view of the number and level of danger of threats, the external environment for the activity of a financial and credit institution can be characterized in its "pure form" as follows:

- a neutral environment that practically does not affect the functioning of the institution; such a situation occurs when the interests of economic subjects do not overlap and they act relatively independently of each other;
- a favorable environment that facilitates the development of economic entities, brings positive changes in their functioning;
- a hostile environment is characterized by a cumulative negative impact on the institution, its economic interests, causes stagnation and decline of the organization.

We agree with the opinion of Z.S. Varnalia regarding the fact that the content of the threat is directly related to its form. According to the scientific point of view, the form of the threat should be understood as its external expression. The form determines the limits of the threat and gives its content factual certainty in the objective world. The threat acquires the status of being available for research and assessment precisely because of the form. [25, p. 65]. There are threats to the economic security of financial and credit institutions

extremely diverse, they constantly appear and disappear over time, change and transform, therefore their identification should be based on a scientifically based classification. For its formation, in our opinion, it is appropriate to use the classifications of threats proposed by scientists who conduct research on the economic security of various subjects (state, region, enterprises, banks, financial institutions) (Appendix B), since the approaches to the selection of classification signs are quite general.

First of all, scientists are unanimous in the fact that according to the sources of origin (scope of occurrence), threats are divided into external, generated in the external environment of the financial and credit institution, and internal, which are the result of the organization and functioning of the institution. However, in the future, the list and explanation of the content of these threats differ significantly depending on the focus of research, which is certainly not a disadvantage and indicates an almost infinite number of types of threats that can be identified. In connection with that, we will also note that, in our opinion, the improvement of the classification should consist not so much in the addition of new features, but in a critical analysis and a clearer interpretation of the existing ones.

Thus, the authors of the textbook "Security of banking activity", understanding threats as potential or real actions of certain subjects capable of causing material or moral damage to a specific bank, consider the types of threats by the scope of occurrence precisely from the "subject" point of view. Sources of external threats are called competitors; persons engaged in criminal activities, criminal groups; bank clients, potential and existing partners; control and supervisory bodies; mass media, etc. Political threats, natural disasters and man-made accidents and disasters are also mentioned. Internal threats to the bank, according to M.I. Zubka. and S.M. Yaremenko, caused by unprofessional work of employees, dishonest attitude and conflict, illegal actions and criminal behavior. In addition to the mentioned aspects, internal threats may arise as a result of the use of imperfect or ineffective banking technologies

production and information support, inadequate banking intra-object mode of activity in institutions [19, p. 73-77].

In turn, Zveryakov M.I., Kovalenko V.V., Sergeeva O.S., analyzing the management of the financial stability of banks, single out such external threats to their security as global banking crises, the peculiarities of the use of monetary instruments by the NBU, the imperfection of banking supervision and regulation, public distrust of banking and monetary systems, competitive environment, processes of legalization of criminal income and financing of terrorism, unfavorable macroeconomic conditions. The authors refer to internal threats as follows: imperfection of the financial management system; imperfect organization of basic banking operations; non-compliance with liquidity by the banking institution; weakness of the bank's marketing policy; insufficient qualification and honesty of bank personnel, etc. [92, p. 246-247].

Some types of external and internal threats to the security of financial and credit institutions, identified by the Basel Committee on Banking Supervision, are reflected in Appendix G.

An additional type of threats based on the field of occurrence is offered by I.I. Mantsurov. and Nusinova O.V. [93], dividing external threats into "threats of external pressure" arising outside the boundaries of the economic entity without its participation, and

"reputational threats" associated with the formation of a negative opinion of the enterprise among external counterparties; they arise outside the enterprise, but are determined by its actions and results. Given that reputational threats are extremely dangerous for financial and credit institutions, we consider it appropriate to include them as a subtype of external threats to the activity of the PKU.

Many scientists, along with the division of threats to economic security into external and internal, also note their types, such as objective and subjective [94, p. 29], calling this feature "by attitude to threats", "by the cause of occurrence", "by source of origin". Threats are explained as those that arise beyond the will and without the participation of the economic entity (objective), and those that are created

as a result of the actions of such a subject (subjective). There is also an opinion that objective threats are natural, and subjective threats are artificial [95, p. 78]. In our opinion, such interpretations of this sign practically duplicate the content of the sign "by the sphere of occurrence", since objective threats are external to the subject, and subjective threats are internal. In addition, only the operation of economic laws and the occurrence of natural phenomena are objective, everything else - politics, legislation, management mechanisms, etc. is the result of conscious actions of people.

Next, in almost all classifications there is a division of threats into potential and real ones, while the following is indicated as a feature: by the possibility of implementation, by the level of formation, by the form of manifestation. It is thought that, based on the previous considerations regarding the relationship between threats and risks, it would be most appropriate to call this feature "by the form of existence". A threat can be considered already existing if its essence is formulated and it is taken into account when making commercial decisions. Another thing is that until a certain time it does not affect the processes, in particular, of the financial and credit institution and is potential; accordingly, when it is activated, it becomes real (for example, the threat of non-recognition of the non-profit status of domestic credit unions became a reality due to the adoption of changes to the Tax Code of Ukraine [96, p. 54]).

Some scientists [87;97] propose to divide threats into hidden and overt, but, in our opinion, such a division is identical in meaning to the above sign.

An important and often mentioned sign of threats to economic security is characterized as "by the nature of occurrence", "by the sphere of direction", "by type", "by essence" and according to which they are divided into economic, political, social, legal (legislative), informational, technological, environmental, etc. We suggest calling this criterion "by nature of origin", which, in our opinion, more accurately conveys the essence of the specified types of threats. In addition, instead of legal threats, institutional ones should be considered as reflecting influence

not only legal norms, but also the activities of various institutes (organizations). Economic, institutional and information threats are particularly relevant for financial and credit institutions among the threats identified by the scope of occurrence.

Practically all authors in one form or another mention a sign of threats related to the duration of their action, but as types they indicate either temporary and permanent, or with a more detailed gradation in time - short-term, medium-term, etc. In our opinion, during the identification of threats, due to the rapidity of the environment, it is very difficult to determine the time of their action in the future. Therefore, it is impractical to talk about any more or less long periods of time, therefore, it is worth leaving such types of threats as temporary and permanent in the classification.

This feature is closely related to the division of threats according to the systematicity of their manifestation [98, p. 132]. Despite the unconditional presence of a certain semantic aspect, the authors of this point of view explain systematic threats as those that exist constantly (or for a long enough time), and unsystematic threats as those that affect the activity of the subject stochastically or with a defined period of occurrence, that is, in fact identify them with permanent and temporary.

According to the sign of predictability, predicted threats are distinguished, which can be predicted and their consequences localized in time, or at least be prepared for them, as well as unforeseeable (in other versions of the classification – foreseeable and force majeure). Forecasting of threats is carried out based on the results of monitoring the economic security of the financial and credit institution for the further formation and application of management measures of a strategic, tactical and operational nature. Unforeseen threats, as already understood, cannot be prevented, because they appear out of the blue, which makes the process of their neutralization extremely difficult.

Quite often in the analyzed classifications there is a feature "by nature of direction", "nature of influence" or "mechanism of influence", according to which threats are divided into direct and indirect (indirect). In our interpretation, direct threats to the security of a financial and credit institution directly affect its economic interests and can be formed, including, by targeted

intentional activity of other subjects. Indirect threats create an unfavorable operating environment for many economic agents and indirectly affect the activity of the PKU (in particular, the negative dynamics of macroeconomic indicators - the volume of GDP, the level of inflation, incomes of the population, etc.). We consider the more accurate name of the sign to be based on the nature of the effect.

Scientists note the degree of danger or significance of threats as another classification feature. We agree that threats to economic security can have a more or less powerful influence on its level, which is established during the identification of threats to the PKU. However, it is quite difficult to determine the degree of its real impact before the threat is realized, therefore, in our opinion, it is worth using such indicative types as dangerous and especially dangerous, the identification of threats to which is determined on the basis of previous activity experience.

Next, we need to dwell on the classification features available in the literature, in which, in our opinion, the essence of threats and their consequences, as well as threats and risks, are somewhat mixed up, which confirms the already mentioned opinion of G.V. Kozachenko. and Yu.S. Pogorelova [81, p. 163-164]. So, when using the signs "by the scale of damage" (insignificant, significant, catastrophic), "by the degree of severity of consequences" (insignificant damage, marginal damage, significant damage), "by the degree of impact on safety" (significant, permissible, minimal) in fact it is not the threat itself that is characterized, but the consequences of its implementation. The analysis is carried out upon the occurrence of an adverse event, based on the results of the negative impact, since it is impossible to predict the degree of significance of the damage caused in advance.

Scientists offer such a classification feature as "according to the degree of manageability" [99, p. 66] or "preventable", distinguishing between managed and unmanaged threats. According to these authors, this feature characterizes the ability of the management of the organization to independently localize the consequences. It should be noted here that threats cannot be objectively managed, they can only be countered, and the consequences of their implementation in any situation are

the responsibility of the financial and credit institution, with the exception of cases of transfer of risks to third parties, which is a component of managing risks rather than threats.

Therefore, in our opinion, it is necessary and sufficient to use the features shown in the table to reflect the main characteristics of threats to the security of financial and credit institutions. 1.2.

Table 1.2

Classification of threats to the economic security of financial and credit institutions

Sign	Types of threats
By field of occurrence	External (including reputational), internal
According to the form of existence	Potential, real
By nature of origin	Economic, political, social, institutional, informational, technological, environmental, etc.
By duration of action	Temporary, permanent
By the nature of the influence	Direct, indirect (indirect)
According to the degree of danger	Dangerous, especially dangerous
Predictably	Predicted, unpredicted

Source: compiled by the author based on the processing of information in Appendix B

The result of conducting a diagnosis of threats to the economic security of a financial and credit institution is an assessment of the level of security of the institution in general and in terms of individual security components, identification of the most vulnerable business processes, divisions and resources. Next, there is the question of developing a mechanism for preventing and neutralizing threats, which is the basis of stable and progressive development of the PKU. In order to form an effective response to threats, a financial and credit institution must rely on reliable information data, versatile results of the analysis of the external and internal environment of activity. Proper informational and analytical provision of the economic security of financial and credit institutions is the necessary basis for making informed management decisions.

### **1.3. Informational and analytical provision of economic security of financial and credit institutions**

Achieving the necessary level of economic security of financial and credit institutions requires an adequate and timely response to the entire range of threats to their economic interests, and this necessitates the continuous receipt of reliable and complete information not only about the threats themselves, but also about the possibilities of neutralization and effective influence on them. Fulfillment of this complex task is the main goal of the organization of information and analytical support of economic security (IAZEB), and among the necessary prerequisites for its achievement it is worth noting: continuous exchange of reliable information between subjects of security maintenance; establishment of sustainable information relations between persons whose activities are related to ensuring security; stability of information connections between technical components involved in security maintenance. An effective IAZEB is an information basis for decision-making in the system of ensuring the economic security of financial and credit institutions.

As noted by A.L. Balanda, the existing approaches to understanding the information and analytical provision of the economic security of business entities are mainly divided into two directions:

- 1) an approach to the process of creation and protection of the informational component of economic security of the subject;
- 2) approach as a system for forming the information resource of the subject's activity in order to ensure the functioning of the economic security system [100, p. 152].

Our study is based on the second approach. We consider information and analytical provision to be a component of the mechanism for ensuring the economic security of the FCU, along with its other components, such as regulatory, methodological, personnel, financial and other provision.

The concept of information and analytical provision of economic security of a financial and credit institution includes two interrelated components -

informational (receiving, collecting, extracting, processing, accumulating and storing information) and analytical (processing information with subsequent rendering to it capable of providing new knowledge). In order to most thoroughly determine the essence and meaning of the information and analytical security support of the PKU, we will consider the content of these components separately.

First of all, information is information and data of any nature that can be stored on physical media with subsequent display on electronic resources. [101]. Information support of management processes is considered by scientists at different levels of the economic system. Investigating the issue of information support for the decision-making process in public administration, Ulyanchenko Yu. and Hnatenko A. suggest that under information support we mean information that is in the database of information systems or on other media, and is important for the management of economic processes, the creation of stable information conditions functioning of the national system, provision of necessary information, inclusion in the system of means of searching, receiving, saving, accumulating, transmitting, processing for obtaining high-quality information, organization of data banks according to certain types of functioning of the processes of economic activity of the state [102, p. 230-231].

Considering information provision in the context of enterprise management, Savchenko O.R. defines it as a process of permanent and purposeful search and selection of relevant information data, which serve as a basis for planning, analysis, evaluation and control, organization of preparation and implementation of effective management decisions in all areas of activity of the economic entity [103, p. 86].

Kharchenko V.V. comes to the conclusion that information support is considered by some authors as an information base, and by others as a set of information base, technical and software, information technologies, etc. The scientist considers it expedient to interpret information support as a system that includes receiving, storing, processing,

transmission, protection and updating of information, as well as a separate element of other systems (providing these systems with information) [104, p. 146].

At the same time, if we analyze information provision as one of the supporting subsystems of maintaining economic security, we can distinguish three points of view found in the economic literature. It is considered as:

- a set of information (databases, statistical reports, documents, orders and information arrays), that is, all information resources that are taken into account when developing and making relevant management decisions;
- the process of collecting, storing, processing, searching and issuing the necessary information to users at their request;
- the information product created in the subsystem of information support, as well as the process of functioning of such a subsystem.

It is believed that in order to provide a comprehensive view of the researched issues, it is worth following the last point of view.

The information system, as a rule, covers all areas of activity of a financial and credit institution: administrative, operational, financial, acts as a connecting link in the development of a strategy for the development of the PKU and the quality of management of the institution and personnel. It contains information related to plans, the state of financial flows, contractual activities, business reputation, financial and management accounting data, market information (about the competitive environment, average prices for services, etc.). The importance of comprehensive information systems for ensuring economic security is that such information can be used by owners, investors, creditors and customers to assess the stability of a financial and credit institution and its actual financial condition, as well as auditors and tax authorities when checking the correctness of accounting and tax deductions. In addition, objective market information helps to timely orientate on emerging threats and adapt the functioning of the PKU to the new realities of the external environment.

However, a certain part of such information is strictly confidential, and its loss may be critical for the work of a financial and credit institution, therefore the organization of users' work with the information contained in the system requires special protection measures that ensure confidentiality, integrity, but at the same time , and data availability.

The classification of information for the purposes of ensuring the security of financial and credit institutions is shown in fig. 1.5.

CLASSIFICATION OF INFORMATION	<i>By sources of income</i> external; internal
	<i>In relation to the subject of research</i> main; auxiliary
	<i>By processing stages</i> primary; secondary
	<i>By frequency of receipt</i> permanent; periodic; one time
	<i>By content</i> accounting; reporting; normative; planned; market
	<i>By volume</i> sufficient; insufficient
	<i>By display method</i> textual; digital; graphic
	<i>By area of distribution</i> confidential; public
	<i>By coverage time</i> current; retrospective

Rice. 1.5. Classification of information for the purposes of ensuring the security of financial and credit institutions

Source: author's own development

The information used to ensure the economic security of financial and credit institutions is subject to the following requirements:

- relevance – compliance of the received message with the information request;
- reliability - information should reflect real processes and indicators;
- completeness - the usefulness of information depends on its completeness, because its partial completeness leads to false results of information and analytical work;
- comparability - information related to the same process must be identical, regardless of the source;
- efficiency - information has value only when it is relevant;
- efficiency - the effect of gathering and analytical processing of information should exceed the costs of its implementation;
- convenience – information should be provided in a practical and user-friendly form;
- expediency - information is considered useful when it is necessary for analytical calculations. It is extremely necessary to prevent overloading of the information and analytical support system with extraneous information unrelated to the economic security of the financial and credit institution [105; 106].

The functioning of the information support subsystem determines the formation of various information flows in financial and credit institutions, among which the following stand out:

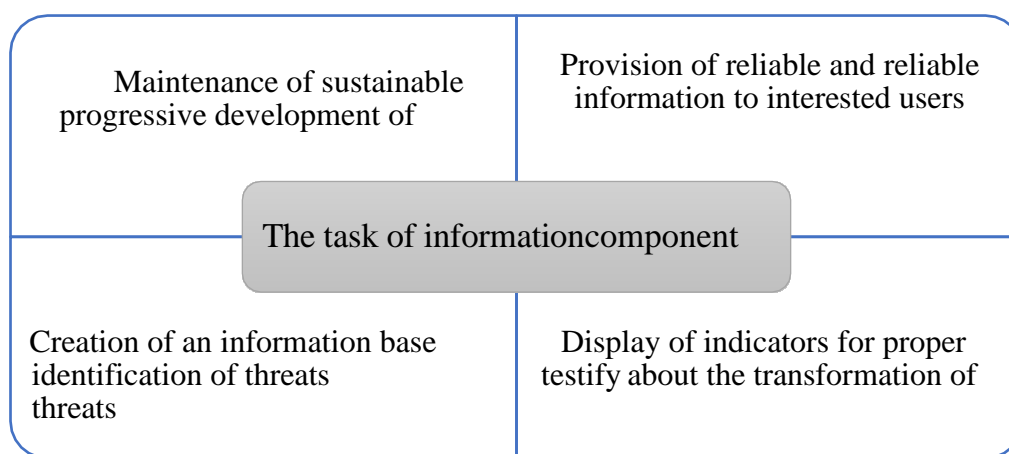
- external flows of information - the receipt of information from regulatory and other government bodies, customers, counterparties, other FCUs, rating and analytical agencies, mass media, etc., which, as

as a rule, is the basis for determining external threats to the security of a financial and credit institution;

- internal information flows – the movement of information between structural divisions, employees in the process of FCU activity, which, on the one hand, provides an idea of the presence of internal threats, and on the other hand, is the basis for making management decisions about ways to counter threats. It should be taken into account that internal information is confidential and employees can provide and receive it only within the limits of their competence;

- ascending, descending and horizontal information flows, which differ in the direction of information movement: from ordinary employees to leaders and top managers; from managers to executors; between employees of the same hierarchical level of the financial and credit institution's organizational structure. Thanks to these information flows, actions are coordinated to maintain the economic security of the FCU.

In our opinion, the information subsystem of ensuring economic security performs the tasks shown in fig. 1.6.



Rice. 1.6. Tasks of the informational component of informational and analytical provision of economic security of financial and credit institutions

Source: author's own development

However, the description of IAZEB would be incomplete without consideration of its active transformative component - analytical activity, which is carried out using accumulated and systematized information and is

formation by relevant specialists on the basis of scientifically based methods of new knowledge regarding threats to the economic security of financial and credit institutions and risk management, which are activated by them. Available information is a collection of certain facts, in which their relationship is contained in a hidden (implicit) form. Identifying these connections is an analytical activity. The specificity of the analytical work in the field of security of the PKU is determined by the need for a comprehensive approach to the study of economic and social factors that must be taken into account when determining ways to counter threats.

Despite the "analytical" characteristic, this activity actually encompasses the closely related analysis of information and the synthesis of its results. Information analysis is the process of processing available information, it involves dividing information into elements and their special study. It involves the understanding of all information and its separate parts, the selection of main and secondary, important and non-essential information, the detection of false information or misinformation. And information synthesis is a purposeful process of generalization, creation of a logically complete system of necessary information and transformation of individual researched elements into organized knowledge that reflects:

- assessment of the state of the financial and credit institution's external environment and its impact due to the set of identified threats on the level of its economic security;
- characteristics of the internal environment of the PKU and potential threats related to it;
- actual assessment of the level of economic security of a financial and credit institution.

For analytical processing of information about threats and their level, well-known methods of economic analysis are used, in particular: coefficient, factor, trend, correlation-regression, as well as methods of applied statistics, economic-mathematical modeling, etc. The conditions for improving the quality of analytical activity are the improvement of software

the technical basis for its implementation, the availability of qualified personnel, as well as the adequacy of scientific and methodological support. To the latter, scientists include definitions of: the system of indicators for assessing the state of economic security; a set of generalizing characteristics-indicators for evaluating processes related to economic security; periodicity of the display of phenomena and processes, interaction with other indicator systems; a set of rules, techniques and methods of analysis, intended for evaluating information and preparing a basis for making managerial decisions on the problems of ensuring economic security [107, p. 159].

At the same time, it is worth agreeing in advance the principles of conducting analytical activities in financial and credit institutions with the requirements for its results on the part of decision-makers in the field of economic security (Table 1.3).

Table 1.3

Reciprocity of requirements for analytical information in the field of provision  
economic security with principles of economic analysis

Requirements for summary information	Principles of economic analysis in financial credit institution
Value for users	Practical significance, timeliness, essentiality. Predictive value (the ability to predict the state of security in the future based on the analysis). Cost-effectiveness (costs for carrying out analysis should be significantly less than the obtained effect).
Reliability, reliability	Reliability of used methods and techniques, as well as indicators. Possibility of verification. Reasonableness and evidence. Objectivity (impartiality). Compatibility of reporting indicators and analysis results.
Completeness, sufficiency for making management decisions	Systematicity, complexity, continuity, dynamism, science
The possibility of qualitative interpretation analysis results	Comparability with data for previous periods, with data for other FKU, with averages for the relevant market sector

Source: developed by the author using [108]

Thus, information and analytical support is an integral and extremely important component of the process of maintaining the economic security of financial and credit institutions, the content of which is interpreted somewhat differently by domestic scientists.

Thus, the authors of the article [109, p. 82] believe that information and analytical security of the enterprise is provided by obtaining and

information processing with subsequent provision of the necessary information to management. The tasks of the analyst in the process of processing a multi-layered array of data and forming reliable information are reduced to evaluating information (determining the degree of its probability); information processing ("filtering" of information and sifting out incorrect and redundant information); carrying out a forecast of the possible development of the situation, taking into account the received information (on which this information has or will have an impact).

Goryachkivska I.V. understands the information and analytical provision of the economic security of a business entity as a set of actions aimed at searching, collecting and organizing information related to threats to the normal activity of the business entity and risks in its work, and the mechanisms of its processing, assessment, inspections with the aim of obtaining complete, objective and reliable data for making rational management decisions regarding the areas of effective provision of economic security of the subject of economic activity [110, p. 28].

According to the authors of the textbook "Banking Security", information and analytical work (IAR) involves the collection, summarization and processing of open access information, the development of the necessary information package of documents and its direct transfer to the management of the institution (bank). That is, IAR is primarily work in the environment of accessible and open information data, which involves the collection of information, analytical analysis and the formation of a package of relevant information documents. The final stage of IAR is informing the bank's management [108, p. 28-29]. In our opinion, it is hardly possible to agree that the IAR is limited to the collection and processing of only open information, because in this case the internal environment of the PKU, information about which is, as a rule, confidential, remains overlooked.

Information and analytical provision of economic security of the bank is determined by I.P. Moiseyenko. and Martyniuk O.A. as a system of interaction of subjects and their use of special methods, means and forms of obtaining,

accumulation and analysis of information, formation of forecasts, development of information and analytical documents and direct participation in the creation of banking products. The main goal of the information and analytical provision of the bank's economic security is defined by scientists as the identification of threats and risks at an early stage in order to prevent economic losses; ensuring planning, preparation and implementation of anti-crisis measures [111, p. 208].

Zachosova N.V. and Goryachkivska I.V. interpret IAZEB as an interconnected process of searching, collecting and recording information, its further distribution and accumulation, conducting analysis, saving the obtained results and transferring the obtained information. The obtained data relate to the subject's various spheres of activity, its current state of affairs and the protection of corporate resources from various manifestations of destabilizing factors [106, p. 343]. Here it is worth noting that information and analytical support, in our opinion, should not only reflect the existing and retrospective state of the economic security of the PKU, but also provide guidelines for its evaluation in the future. Therefore, IAZEB should have an inherent function of forecasting, i.e. predicting events (processes) in the field of economic security of the FKU for the future, as well as promising opportunities for ensuring its security at the appropriate level. It is possible to single out a number of tasks that can be solved at the same time:

- evaluation of possible ways of development of the activities of financial and credit institutions in the context of ensuring economic security;
- predicting the direction of development and quantitative parameters of internal and external threats to the security of the PKU and their negative consequences;
- assessment of the potential impact of positive and negative factors (processes and events) on the future development of the PKU in the context of ensuring its safety;
- formation of an idea about the forecast options for the development of events in the field of economic security in connection with the implementation of certain measures aimed at increasing its level.

We believe that the presence of an element of forecasting as part of information and analytical support will make it possible to more systematically maintain the appropriate level of economic security of financial and credit institutions in the current and prospective periods.

Systematizing all of the above, we suggest that information and analytical support for the economic security of financial and credit institutions should be understood as a purposeful and continuous process of searching and collecting information related to external and internal threats to the safe operation of the institution, the mechanisms of its verification, evaluation and analysis in order to obtain complete, objective and reliable data regarding the existing and prospective threats to the realization of its economic interests for the adoption of reasonable management decisions regarding directions and specific measures to effectively ensure the economic security of the FCU.

Therefore, the main goal of information and analytical provision of the economic security of financial and credit institutions is to provide an opportunity to solve the issue of protection against threats and, which is no less important, to warn the institution about the presence of certain conditions that may lead to the emergence of these threats and their potential consequences .

For the rational organization of information and analytical provision and effective performance of the above-mentioned tasks, financial and credit institutions should rely on certain principles of information and analytical activity, which should be formulated, relying on the scientific work of domestic scientists [86; 111; 112; 113]:

- systematicity, which involves the formation of IAZEB as a complex dynamic system, that is, a set of elements (information, methods and methods of analysis, source documents, specialists, etc.), which are interconnected, interdependent and create the appropriate integrity;
- compatibility, according to which information interfaces must be formed when creating IAZEB and rules for interaction with other

components of the security system and the organizational and management system of the financial and credit institution in general;

- flexibility (adaptability), which consists in the possibility of rapid adaptation of IAZEB to changes in the external and internal environment without significant modification of methods and means of gathering information and conducting analytical work;

- reasonableness, which requires providing reasoned results of analytical work based on the use of modern scientific approaches, analytical techniques and information technologies, etc.;

- proactivity, according to which the operation of the IAZEB should be aimed at conducting research and forming results regardless of specific user requests, which involves anticipatory work with elements of forecasting;

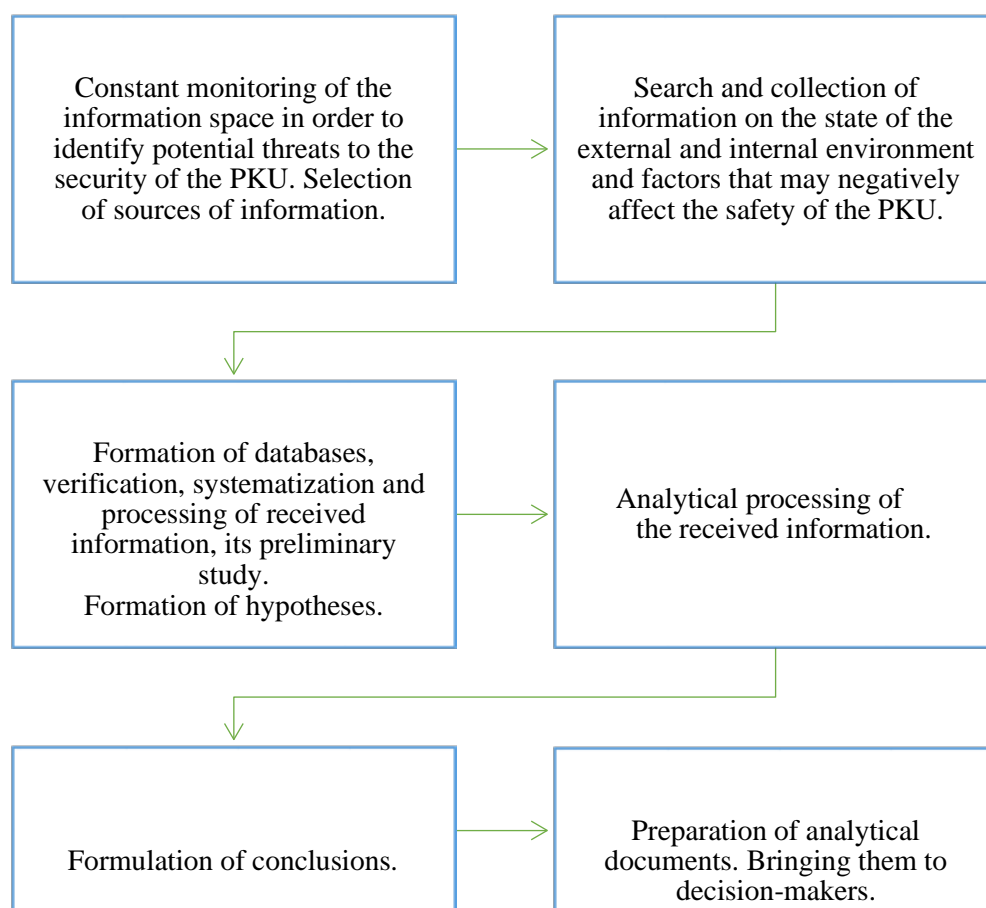
- of uniformity (standardization), which assumes that in the process of information and analytical activity for its optimization, it is advisable to use typical, standardized elements, solutions, processes, and application programs to solve the widest possible range of tasks;

- constant development, which requires, along with the use of standardized elements, regular updating of IAZEB on the basis of the latest achievements of science and information and computer technologies without disrupting the process of its functioning;

- a unified information base, which consists in the fact that information, once entered into the system, becomes available to all users and can be used multiple times;

- the principle of efficiency, which provides for the achievement of an optimal ratio between costs and target results of the operation of IAZEB.

In our opinion, the information and analytical provision of economic security of a financial and credit institution is implemented in the sequence of stages shown in fig. 1.7.



Rice. 1.7. Stages of implementation of information and analytical provision of economic security of a financial and credit institution

Source: author's own development

In financial and credit institutions, functions of informational and analytical support of economic security are performed by various structural divisions, depending on the diversity and scale of activities of the FCU, their organizational structure and corporate management. The ability of FKU to resist external and internal threats, maintain an appropriate level of stability, develop and obtain a positive financial result depends on their coordinated work.

As for commercial banks, the main units that carry out information and analytical work in the field of ensuring economic security are the bank security service (department), risk management units, financial monitoring unit and internal audit unit. One of the functions of the security service is development and implementation

preventive measures aimed at detecting illegal encroachments on the bank's activities, namely: research into the causes and motives that prompt the commission of illegal encroachments on banks; identification of the security objects most exposed to illegal actions and assessment of the degree of their protection against threats of illegal encroachments; development of means and methods of increasing the reliability of protection of specific areas of the bank's activity.

Risk management units accumulate and analyze information on the macroeconomic environment and the situation in various sectors of the financial market, monitor the state of credit and investment portfolios of banks, analyze the creditworthiness of borrowers to prevent the occurrence of credit, currency, market risks, liquidity risks, interest rate changes to ensure stable of the bank's activities. The financial monitoring unit, analyzing financial transactions, detects threats related to the possibility of customers using the bank's services for the purpose of legalizing criminal income and financing terrorism. Finally, the internal audit service analyzes the bank's internal information and draws conclusions regarding the adequacy and effectiveness of measures and the system of internal control, risk management, completeness, expediency and reliability of reporting, compliance with the basic principles and internal accounting process, compliance with regulatory requirements.

As for credit unions, in accordance with the law, they must form a credit committee and elect an audit commission, which in a certain way perform the functions of information and analytical support for the economic security of the credit union. In addition, an employee responsible for financial monitoring must be appointed. The credit committee controls the quality of the credit portfolio, analyzes the causes of credit risks and resolves other issues related to credit activity as the main area of active operations of the credit union. The audit commission exercises control over the financial and economic activities of the credit union and, accordingly, at its request, any materials, accounting and other, are provided

documents together with an explanation from the officials of the institution. The importance of its conclusions is evidenced by the fact that the audit commission can temporarily terminate the authority of any official in the event that violations were detected that could lead to a deterioration in the financial stability of the credit union. The reason for convening an extraordinary general meeting is the immediate presence of a threat to the existence of the credit union [53].

As for pawnshops, they can operate as single small institutions with a staff of 5-7 people or as network, multi-branch institutions. In the first case, the director actually takes over the functions of information and analytical support or transfers them to the manager, if he is available in the pawnbroker's staff. In the second case, risk management and internal audit divisions can be created in the central office, the tasks of which include risk identification, determination of the pawnbroker's risk profile, identification of significant risks, constant monitoring of risks; control over the level of risk acceptable for the institution; conducting modeling and forecasting of processes and future results of the institution's activities based on information analysis and risk assessment. In addition, in any case, an employee responsible for financial monitoring is appointed.

Therefore, in modern conditions, information and analytical work should be considered as an intellectual and creative activity, which is difficult to formalize, for the collection, processing, analysis and interpretation of information to support management decision-making. It should be recognized as an important element of the system of ensuring the economic security of the business entity, and include at the applied level measures and methods of competitive intelligence, marketing research, financial audit and legal support of contractual activities, which determine the content of information and analytical work. Specialists in information and analytical work must possess the theoretical foundations and practical methods of ensuring effective search, analysis and

information visualization when solving business intelligence tasks using modern information technologies and software tools.

## SECTION 2

### DIAGNOSTICS OF THE ECONOMIC SECURITY OF FINANCIAL AND CREDIT INSTITUTIONS IN UKRAINE

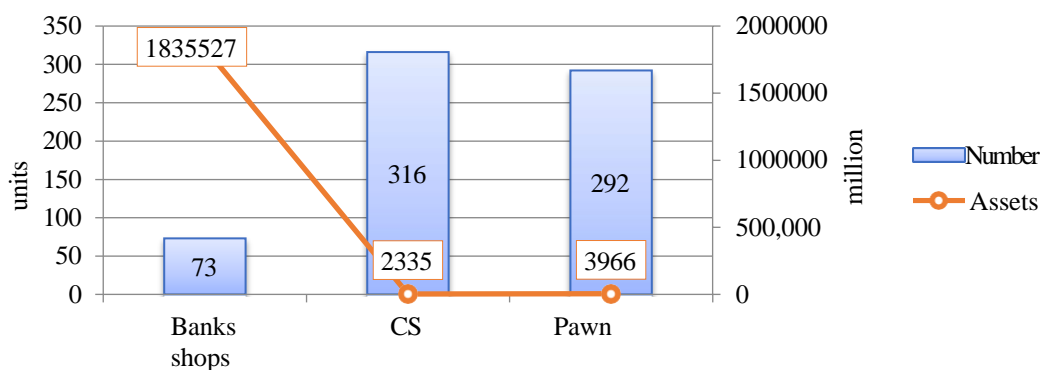
#### **2.1. Analysis of trends in the development of financial and credit institutions of Ukraine and threats to their economic security**

In the conditions of uncertainty and economic instability in Ukraine, the ability to quickly respond to dynamic changes in the financial market is extremely relevant. In order to ensure a high level of their own economic security, financial and credit institutions must constantly monitor the state of the financial sector and its trends. Such diagnostics is carried out with the aim of identifying threats at their initial stages, followed by assessment of the level of the corresponding risk and implementation of countermeasures and minimization of their impact on the development of the financial and credit institution.

Solving the problem of timely identification and detection by financial and credit institutions of threats, the implementation of which will have a negative impact on the state of their economic security, is currently extremely urgent and requires attention. The relevance of this issue is also evident in the fact that FCUs are in close interaction with other strategically important sectors of the economy that depend on credit funds [114, p. 282].

In the world, there is a trend towards the development of non-banking financial services, while the Ukrainian financial sector is bank-centric: the participation of banking institutions in the assets of the financial sector is the largest. In order to carry out clear control and regulation of the activities of financial and credit institutions, from 2020 the regulator of their activities is the National Bank of Ukraine. Prior to that, the regulator of the activities of pawnshops and credit unions was the National Commission, which carries out state regulation in the field of financial services markets.

Since 2017, the financial sector has seen a tendency to reduce the number of financial and credit institutions, which is shown in the table. D.1 (Appendix D). This undoubtedly affects the level of economic security of Ukraine. Thus, as of 2020, the financial market has the largest number of credit unions, but a significant share of market assets is in banks (Fig. 2.1).

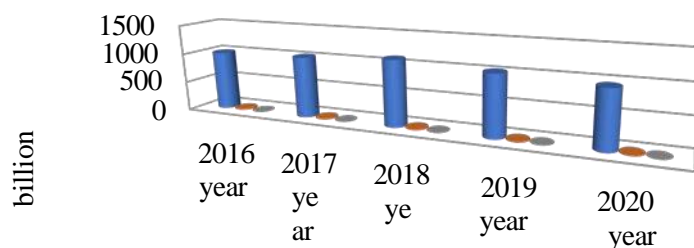


Rice. 2.1. The number of FCUs and their assets in 2020

Source: compiled by the author based on data [115]

As we can note, according to the statistical data of the table. D.1 (Appendix D), the years 2016-2017 were difficult for banking institutions, and only starting from 2018 did the banking sector make a profit and increase its assets. Also, the decrease in the volume of loans granted by financial and credit institutions in 2020 (Fig. 2.2) can be characterized as a consequence of the impact of an external threat - the pandemic - on FKU.

Taking into account the specifics of the FKU's activity, during the problematic period for banks, pawnshops and credit unions ensured their profitable activity and increased their client base. The indicated data confirm our opinion that the reaction of financial and credit institutions to various manifestations of threats will also be different. This does not reduce the level of responsibility of the FCU for ensuring the appropriate level of its economic security. Moreover, banks have a "typical" reaction to destabilizing factors and, occupying the largest share of the market, have a greater influence on the level of development of the entire financial system, compared to pawnshops and credit unions.



	2016 year	2017 year	2018 year	2019 year	2020 is the year
■ Banks	1005.9	1036.7	1118.9	1033.4	960.6
■ Pawn shops	16.4	16.4	18.2	16.5	12.8
■ Credit unions	1.8	1.9	2,2	2.5	2,3

Rice. 2.2. Volumes of loans granted by financial and credit institutions in the period from 2016 to 2020

Source: compiled by the author based on data [116]

Considering the significant share of banks' assets in the financial sector, the decrease in the number of market participants leads to an increase in concentration in the banking system. This can be a catalyst for increasing the power and efficiency of the banking market, but it can also cause the emergence of banks "too big to fail." This may lead to a threat to the integrity and fair competition in the market of economic services, since the very existence of banks "too big to fail" contradicts the concept of activity in the market of financial services of only independent financial and credit institutions capable of solving their own problems.

However, this same aspect of reducing the share of banking institutions in the market will serve as a kind of "push" for the development and establishment of pawnshops and credit unions. As an alternative to bank lending, there are services of pawn shops and credit unions. However, the contribution of their activities to the scale of the country's financial market is insignificant, therefore the main attention in the analysis and assessment of economic security will be focused on the activities of banking institutions.

For a comprehensive analysis of threats to the economic security of financial and credit institutions, we suggest conducting an analysis of market trends

financial services, in accordance with the selected components of economic security, namely: financial, information, personnel, technical and technological, compliance, material and power, marketing. A comprehensive analysis of these components will allow to fully determine the situations and factors threatening the financial and credit institution.

The resource base of the banking sector of Ukraine has a growing tendency [115]. During the analyzed period, the total amount of liabilities increased by 22.7% and their significant structural changes took place. If in 2016 the share of equity in the structure of liabilities was 9.85%, and the share of liabilities was 90.15%, then with an increase in the share of equity in the structure of liabilities to 11.49% in 2020, the share of liabilities liabilities decreased to 88.5%. However, with the reduction of liabilities, the share of funds of individuals increases (from 38.6% to 42.26%) and the share of funds of business entities (from 32.66% to 40.01%).

So, the analysis shows that the main source of resources of the banking sector until 2021 was mainly short-term funds of individuals and corporations, but in 2019, the funds of business entities and their share in the liabilities of banks increased by 29.78%, which significantly reduces the risk of non-compliance with banks' liquidity and, at the same time, increases the level of their financial security.

The standard of adequacy of regulatory capital is one of the main economic standards of bank activity. During the analyzed period, it constantly increased - up to 21.44% as of 2020, which is more by 8.75 percentage points. than in 2016. This shows that the share of risk assumed by bank owners is growing, attracting depositors and guaranteeing them the safety of their funds.

An important indicator of protection for the bank and clients against the influence of negative external and internal factors is the absolute size of banks' own capital. In 2016, as a result of the measures taken by the regulator, the decrease in the amount of equity capital of the banking system stopped, and as of January 1, 2020, its absolute amount was UAH 209.46 billion.

In 2018, the NBU began an annual assessment of the stability of banks [117] and conducted stress testing of 24 of the largest. The results of the assessment showed the capital adequacy of most banks, as well as their ability to generate profit under current conditions. At the same time, a number of institutions did not have sufficient capital reserves in case of crisis phenomena. At the same time, according to the NBU, the share of the authorized capital of banks with state participation in the total amount of authorized capital of solvent banks as of January 1, 2017 was 44.1%, and as of January 1, 2018, it increased to 62.3%. Therefore, the banking sector of Ukraine is properly capitalized. However, if unfavorable factors are realized, credit, interest, and currency risks can reduce the capital adequacy of banks and their safety [115].

The main part of banking operations is lending to various sectors of the economy with significant credit risk. The main indicators of the credit security component of the banking sector are given in the table. E.1 (Appendix E). During 2016-2020, the assets of the banking sector increased by UAH 566.54 billion, or 45.1%, while loans during this period decreased by 4.51%. It is important that, compared to the previous year, in 2020 the rate of growth of assets increased by 22.07%, while the growth rate of loans significantly decreased by 7.06%.

The slow growth of lending to the economy is due to the narrowing of the resource base of banks, the influence of unstable macroeconomic factors and the forced strengthening of requirements for lending conditions by the National Bank of Ukraine. Therefore, there is a tendency to reduce loans from 2016 to 2020. This happened mainly due to a significant decrease in the rate of growth of loans granted to economic entities, which occupy the largest share in the loan portfolio of banks (about 80-84%) and decreased by 11.54% in 2020. The share of personal loans in the credit portfolio of banks decreased somewhat by 6.86% in 2020. But in the total credit mass of the banking sector in the analyzed period, loans to business entities prevailed with a significant gap.

At the same time, in 2016-2020, the depth of penetration of lending into the economy decreased significantly. Thus, the ratio of loans to GDP decreased by 25.3% in 2020 compared to 2016. The share of long-term loans in the total amount of loans granted was the most significant in 2020 and amounted to 54.5%. However, this indicator has a steady tendency to decrease, which negatively reflects the level of the financial security component of banks. At the same time, during the entire analyzed period, hryvnia loans prevail.

The indicator of the concentration of credit risks based on the ratio of the volume of loans granted to the volume of attracted deposits is steadily decreasing from 131.2% in 2016 to 67.9% in 2020. This shows that the vulnerability of domestic banks to crisis phenomena has increased, and therefore their financial component of economic security is decreasing.

The high share of overdue debt is the result of the credit expansion of the past years and low standards for assessing borrowers' solvency. Another reason is lending to related parties who stopped servicing loans during the crisis. Today, the level of coverage of these loans by reserves is constantly increasing and is about 95%. Accordingly, non-performing loans do not have a significant impact on the financial results of banks. However, they are a big burden for the banking system - in particular, about 45% falls on PJSC CB "Privatbank" [115].

The risk for the security of banks from the increase in the share of overdue loans is that borrowers stopped servicing loans, and banks did not receive accrued interest; secondly, banks were forced to form reserves for credit risks, their expenses increased, which negatively affected the profitability of banks.

The characteristics of bank security will be incomplete without an assessment of its investment component (Table 2.1). The size and scope of investments determine the dynamics and quality of transformations in the economy. This is a prerequisite for solving acute social problems. Investment activity of domestic

of banks increased due to the increase in the rate of growth of investments in securities. The years 2016 and 2017 saw the greatest growth due to investments in domestic government loan bonds, which are attractive at their rates and 100% guaranteed by the government.

Table 2.1

Indicators of the investment security component of the banking sector of Ukraine for the period 2016-2020

Indicators	2016 year	2017 year	2018 year	2019 year	2020 year	Growth rates/ deviation, %	
						2020 / 2016	2020 / 2019
General assets, billion hryvnias	1256.3	1333.8	1359.7	1494.5	1822.8	45.09	21.97
Investing in valuables papers, billion hryvnias	238.1	458.4	517.7	564.7	493.4	107.22	-12.63
Share in assets, %	18.95	34,37	38.07	36.06	27.07	8,12	-8.99

Source: compiled by the author based on data [115]

The investment component of security is characterized by the imperfect investment activity of financial and credit institutions, as well as the underdevelopment of the domestic stock market.

One of the indicators of the state of the financial security component of banks is the dynamics of their income and expenses, which is shown in the table. Zh.1 (appendix Z). Analysis of the components of income and expenses of the banking system allows to describe its financial condition, profitability, scale of operations and main areas of activity.

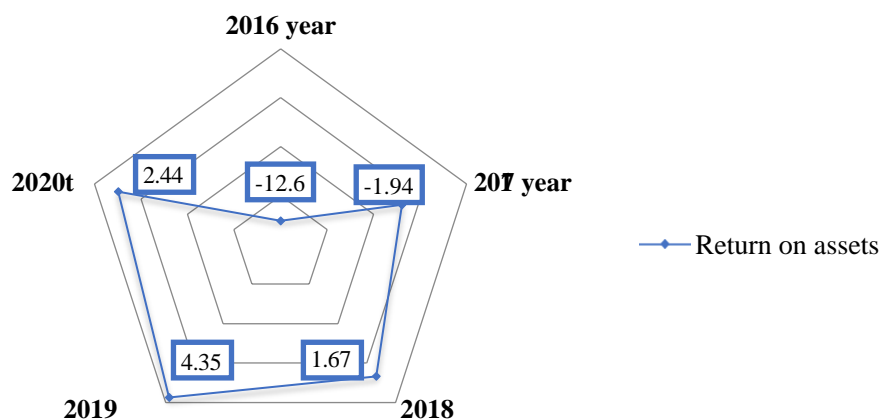
So, we can note that positive results appeared in 2018, previous periods were characterized by unprofitability. This situation arose due to economic, political shocks and military conflicts, which resulted in a systemic banking crisis. The refinancing of banking institutions did not give the expected result, a lot of foreign exchange reserves were lost. In the period 2014–2016, 90 banking institutions were declared insolvent.

Bank losses reached their maximum in 2016. The main reason for the unprofitability of Ukrainian banks in 2016-2017 was the formation

insurance reserves for problem loans. And only in 2018, the financial result of banks became positive - UAH 21.7 billion. In 2019, the profit of banks was the highest for the entire analyzed period - it increased 2.7 times compared to 2018 and amounted to UAH 59.6 billion, although more than half of all profits were received by PJSC CB "Privatbank" [115].

There have been changes in the structure of income and expenses of the banking sector. In particular, the share of commission income is steadily growing - from 16.45% in 2016 to 28.24% in 2020, while traditionally interest income occupies the majority share. The level of security of income and expenses of the banking sector is also evidenced by profitability indicators.

Return on assets (ROA) until 2018 has a negative value, which reflects the inefficiency of the use of assets by banking institutions, and leads to a negative trend of financial results. However, the value of this indicator became positive in 2018 - 1.67% and will increase to 2.44% in 2020 (Fig. 2.3).



Rice. 2.3. Dynamics of changes in the profitability of bank assets in 2016-2020

Source: compiled by the author based on data [115]

The return on equity (ROE) shows that the banking system made a net loss during 2016-17, indicating its instability. However, positive developments during the last two years may indicate a gradual exit from the crisis of the banking system, which was ensured

rapid increase in operating income. Deductions to banks' reserves decreased by 84.35% to UAH 31.03 billion.

So, we can conclude that the crisis of 2014-2015, the annexation of Crimea and the beginning of the military conflict provoked the emergence of a financial and economic crisis in Ukraine, which negatively affected the security of the financial sector. However, as of today, banks are ensuring their financial security and restoring stability. This is evidenced by positive trends in resource and investment potential and a positive financial result of activity. However, there is still a serious threat to the banking system - a high level of non-performing loans. That is why, in order to eliminate the mentioned threat, it is necessary to develop and implement appropriate effective measures at the state level.

We consider it appropriate to investigate the financial stress index (FIS), which indicates the level of tension in the financial sector. It remains at a low level. A short-term increase in the sub-indices of both government and corporate securities caused the presence of index volatility in the last half-year. Corporate securities, in turn, reacted to the dynamics of the increase in the yield of risk-free assets on the world market and the aggravation of the situation related to Russian troops on the territory of Ukraine. The confirmation of this is the stabilization of sub-indices after the reduction of tension on the border [118].

It is significant that the stress level of the sub-index approached its historical minimum in the banking sector. The IFS characterizes only the current state of the financial sector and does not determine future risks in the long or short term.

The second and third waves of strengthening quarantine requirements caused uneven economic development of key trade business partners. Mutations of the virus, the threat of the continuation of the pandemic continue to threaten economic recovery and remain a factor affecting the economic security of financial and credit institutions.

The information component of the economic security of financial and credit institutions is considered from the point of view of cyber threats and incidents such as ransomware attacks. Every year, these factors become an increasing problem for financial and credit institutions, negatively affecting their economic security. Since the beginning of the COVID-19 pandemic, cyber threats have intensified. Remote working conditions and the increase in the provision of financial services using digital channels, which especially applies to banks, have expanded the range of possible channels of influence. This means that attackers, who are becoming more sophisticated, have more access points to information systems. An important point in ensuring the integrity of information systems is the verification of access points with third-party partners. Cyber security measures must take into account the threat from external partners, because if the information channels of one of the users are weakly protected, the entire network is at risk.

A factor that negatively affects the level of economic security of financial and credit institutions is the general level of stability of the country's economy. This is explained by the fact that the level of economic security of institutions directly depends on general economic trends. Thus, the interest rate on bank loans depends on the level of inflation (the main trends of changes in the level of inflation are shown in Fig. 2.4).

Accordingly, the purchasing power of nominal wages exceeds the inflation rate in only three periods (2017, 2019 and 2020). A somewhat insignificant decrease in purchasing power is noted in the first half of 2021. So, the negative dynamics of the index of real wages allows us to say that the population does not have the opportunity to accumulate their income with the subsequent opening of deposit accounts in banks or credit unions. Such dynamics negatively affect the level of economic security of credit institutions, as there is no possibility to make financial investments.

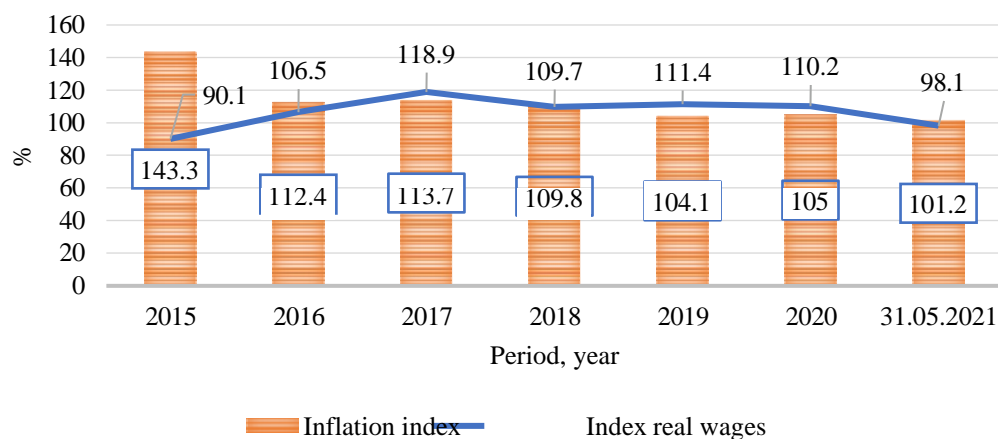
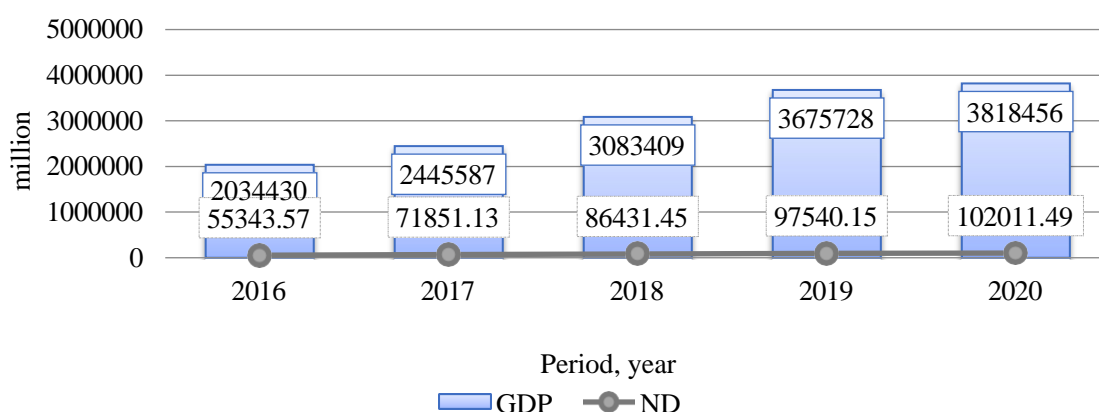


Fig. 2.4. Dynamics of changes in inflation indices and real wages in Ukraine for the period 2015-2021

Source: compiled by the author based on data [115]

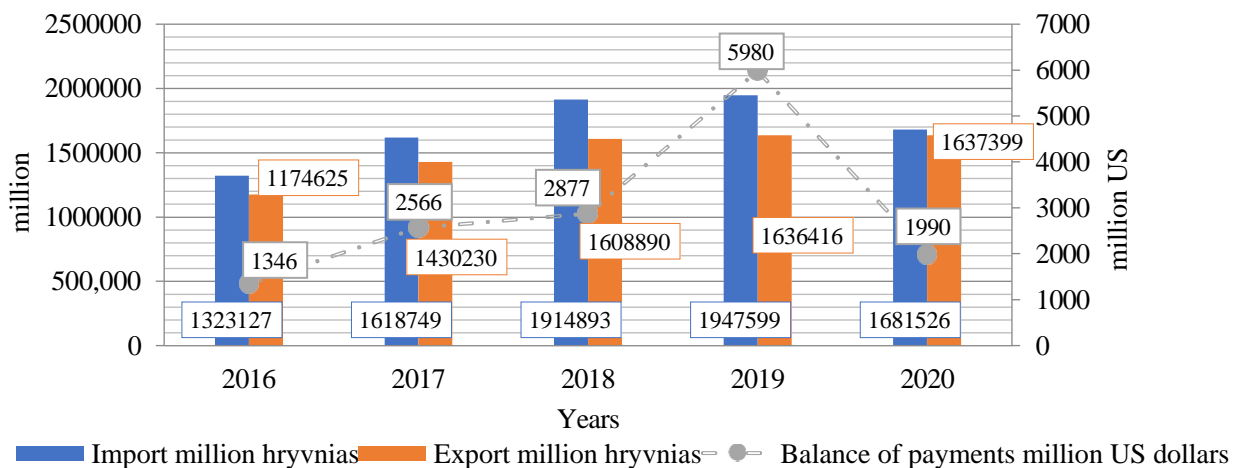
An important indicator in ensuring the financial component of the economic security of financial and credit institutions is the level of GDP, which according to analytical data of the National Bank of Ukraine in the first half of 2021 amounted to UAH 978,343 million. per capita, which is a quarter of the annual real GDP in 2020 (3818456 million hryvnias). Starting from 2016, a slight but stable tendency to increase this indicator along with an increase in national income (ND) per capita has been observed (Fig. 2.5). The high rates of recovery of consumer demand contrast somewhat with the results of the GDP analysis.



Rice. 2.5. Dynamics of changes in gross domestic product and national income in Ukraine in 2016-2020

Source: compiled by the author based on data [116]

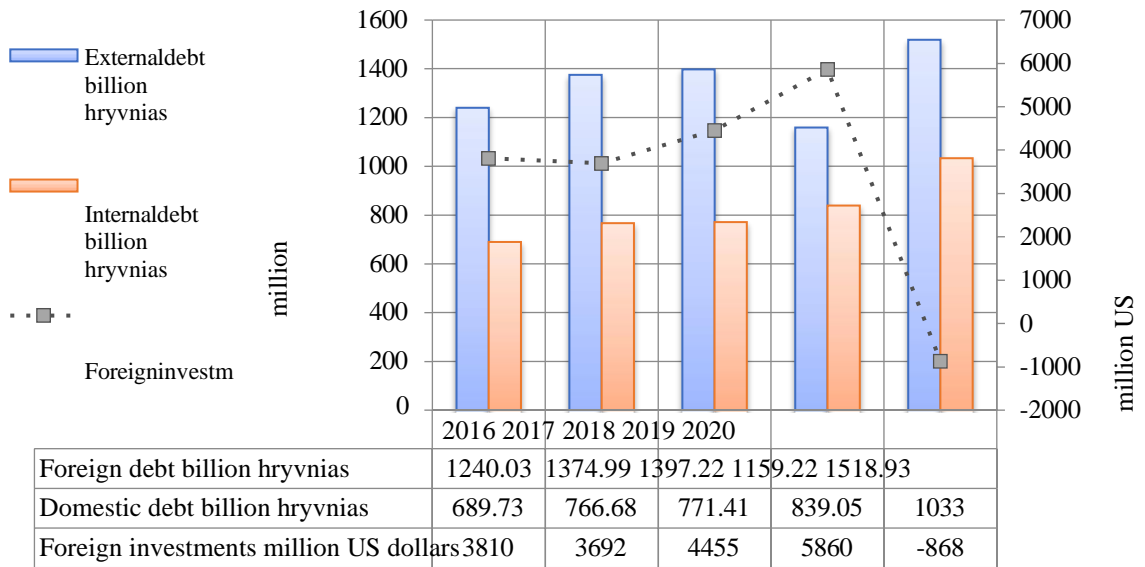
The rapid restoration of import relations, insufficient investments and a decrease in export volumes negatively affected GDP. Quarantine measures implemented on the territory of Ukraine became an auxiliary factor that had a negative effect on the balance of payments (Fig. 2.6).



Rice. 2.6. The dynamics of changes in the volumes of imports, exports and balance of payments of Ukraine in 2016-2020

Source: compiled by the author based on data [115].

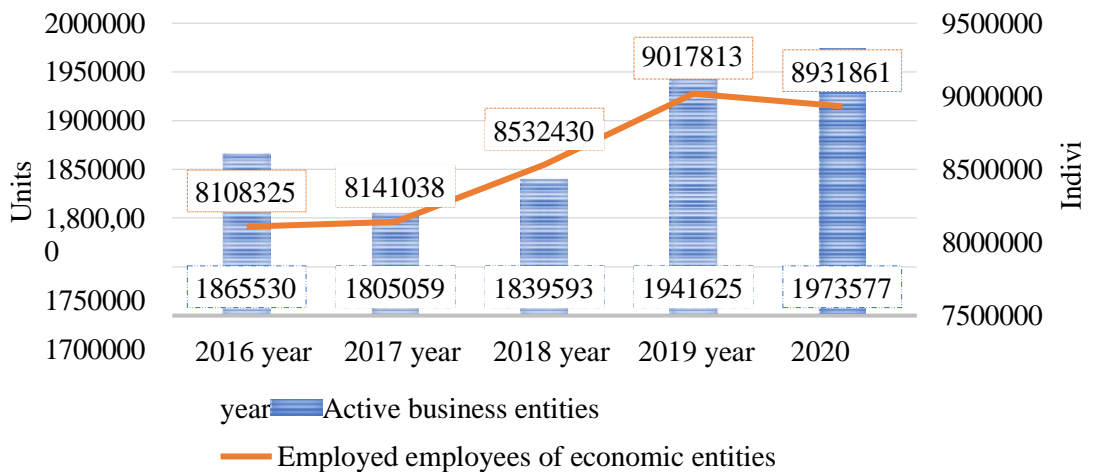
The threat of a new quarantine remains constantly relevant, while the trends towards an increase in the incidence of COVID-19 remain. But, given the long period of the pandemic, which is not clear when it will end, it allowed the economy to adapt to work in the new quarantine conditions to some extent. The introduced quarantine restrictions have greater flexibility for business representatives. But the pandemic affected not only Ukraine, that is why the growth of external and internal debt can be traced with the simultaneous significant outflow of investments from Ukraine (Fig. 2.7). Each country tries to ensure its economic security, stability and social equality as much as possible, therefore it accumulates its own funds to support the economy in the domestic market.



Rice. 2.7. Dynamics of changes in foreign direct investments, internal and external public debt of Ukraine for the period 2016-2020

Source: compiled by the author based on data [115]

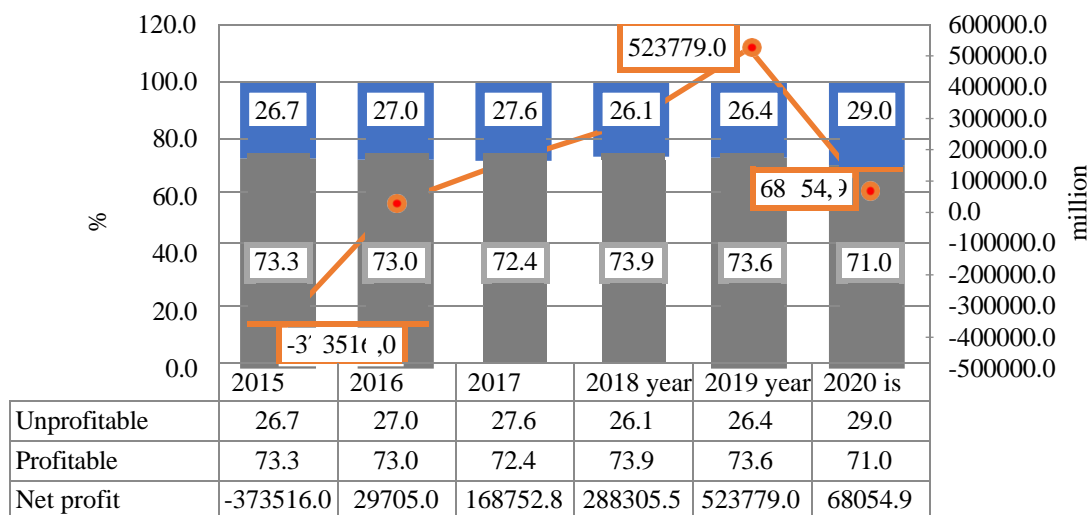
All subjects of the financial market are interconnected, and therefore the tendency to decrease the number of active economic subjects on the territory of Ukraine, and therefore the number of employed workers, will have an impact on the level of economic security of the FCU. The main trends are shown in fig. 2.8 and they show the possibility of threats related to the non-return of loans for banks.



Rice. 2.8. Dynamics active subjects management and employed persons in Ukraine in 2016-2020

Source: compiled by the author based on data [118].

According to the given data in fig. 2.9, the maximum profit of business entities was recorded in 2019 in the amount of UAH 523,779 million. However, after the aggravation of the pandemic, the net profit decreased significantly and amounted to UAH 68,054.9 thousand.



Rice. 2.9. Results of business entities in 2015-2020

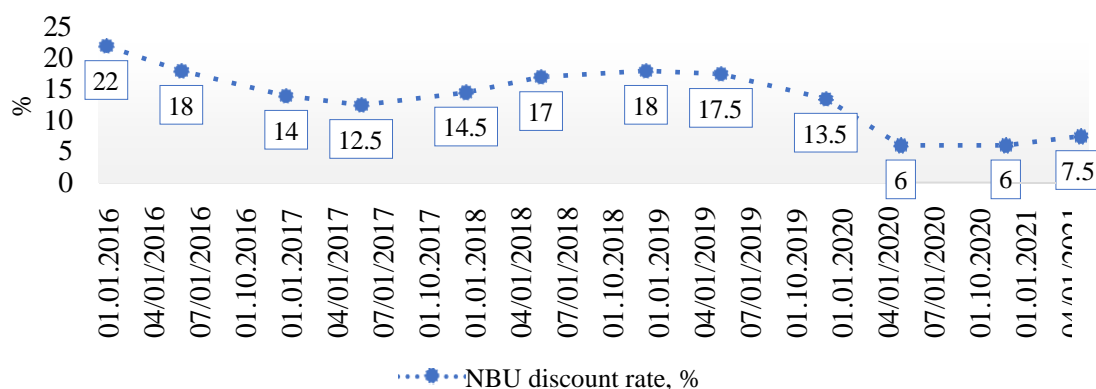
years

Source: compiled by the author based on data [118].

The instability of the national currency and changes in the NBU's discount rate act as a "shock factor", since the value of financial resources and, accordingly, the financial results of the FCU's activity depend on them (Fig. 2.10). A sharp outflow of financial resources threatens the loss of liquidity, a decrease in profitability and a significant decrease in the level of economic security of FKU.

It is worth noting that the threat of loss of liquidity by financial and credit institutions will always be relevant, since even minor changes in the domestic financial sector and at the international level can cause catastrophic consequences for the level of economic security of institutions.

All these factors have a significant impact on individual components of the economic security of financial and credit institutions. Proof of this is their indicators, summarized in the table. I.1 (Appendix I).



Rice. 2.10. Dynamics of the NBU discount rate in 2016-2020

Source: compiled by the author based on data [115].

According to the Financial Stability Board (FSB) [119], such cyber operations as phishing, the distribution of malicious software (so-called viruses) and ransomware (blocking work with the condition that it be restored upon meeting the requirements) increased from below 5 thousand (February 2020) to more than 200 thousand per week (end of April 2021).

Cyber threats were relevant even before the mass transition of financial and credit institutions to online mode of operation. For example, in 2017, a powerful cyber attack was carried out on computer systems by the Petya encryption virus. According to the data of the international company of antivirus programs ESET (Essential Security against Evolving Threats) [120], which develops antivirus software, Ukraine accounts for 75.2% of the total number of infections in the world. In Germany, the percentage is 9%, in Poland - 5.8%, in the Czech Republic - 0.82%, and for other countries of the world in the aggregate - 2.94%.

Operational data of the National Bank of Ukraine show that a third of Ukrainian banks have been affected by this virus. One of the reasons for such vulnerability of financial and credit institutions is explained by the formal attitude to ensuring information security and non-fulfillment of requirements for its control.

Among the main factors that provoke the emergence of cyber threats in a financial and credit institution, we suggest highlighting the following:

1. low level of staff training in case of unauthorized access to the internal network/virus attack;
2. lack of an action plan in the event of a cyber attack - ensuring the "uninterrupted operation" of financial and credit institutions, especially banks;
3. low-quality information systems and software;
4. targeted input of false data by customers in operational mode (introduction of abbreviations, errors in the data of 3rd parties, different formats when integrating data from different information systems).

Accelerated digitalization increased the efficiency of financial and credit institutions, but also drew attention to the greater intensity of cyber threats and new variants of their manifestation, which are becoming more frequent and sophisticated [121, p. 94]. The rapidly developing crypto-asset markets also pose threats to the economic security of financial and credit institutions in terms of impact on its financial component. The rapid development of cryptocurrencies can cause:

- a threat to the stability of the banking system due to the outflow and replacement of deposits with crypto currencies;
- the threat of displacement of traditional banking (which will have a positive effect on the activity of pawnshops and credit unions due to a decrease in competition);
- the threat of the spread of financial pyramids and fraud, which will lead to the loss of investments/savings of the population;
- threat of confidence in the financial market as a whole due to misunderstanding of the system of crypto currencies or loss of expediency in the services of financial and credit institutions.

Effective response to a cyber incident and recovery after it is an important element in the system of ensuring the information component

economic security of financial and credit institutions. The number of cyber attacks has increased significantly, especially since the pandemic. Financial and credit institutions need to consider improving their cyber threat management, cyber incident reporting, response and recovery processes [122, p. 206].

The informational component of the economic security of financial and credit institutions is related to the personnel component. Quite often, threats in the information environment of the institution are caused by the employees themselves.

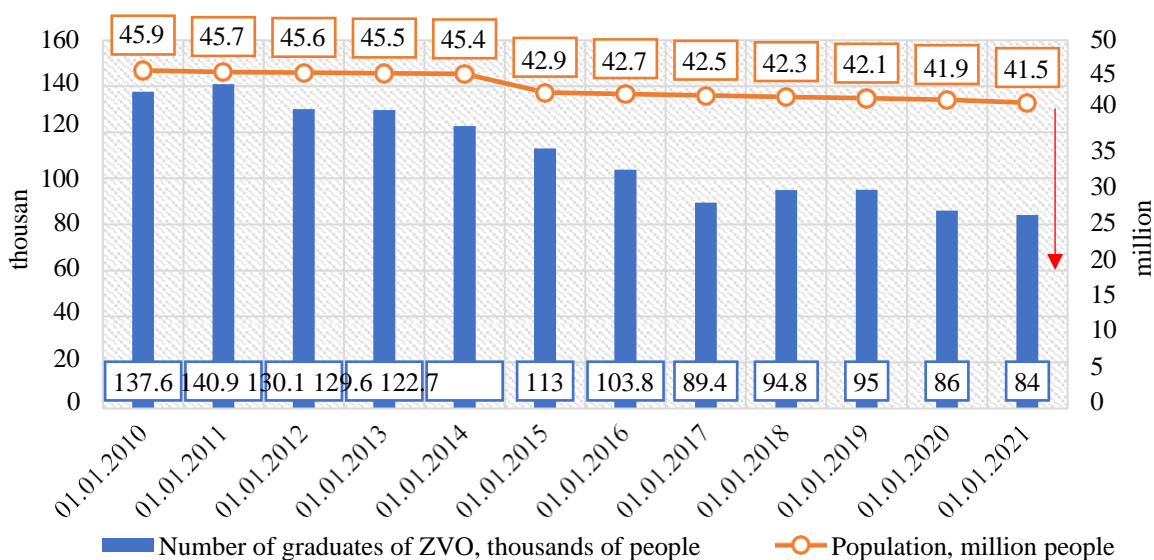
The economic security of a financial and credit institution and the effectiveness of its activities depend on the quality of the personnel management system. The personnel component of the economic security of a financial and credit institution provides for the prevention of threats to the organization of work, personnel, the labor and intellectual potential of personnel, and labor relations in general.

The personnel component of the economic security of a financial and credit institution involves the selection of qualified personnel, the compliance of specialists with the institution's requirements, applicants having a higher education and work experience (if necessary), developing motivational schemes, taking measures to prevent labor disputes and conflicts. Given the importance of its functions, threats to personnel are relevant.

In the context of considering the threat to the personnel component of the economic security of a financial and credit institution, we consider the presence of higher education among the institution's employees to be one of the key aspects. Yes, according to fig. 2.11 there is a negative trend towards a decrease in the level of persons with higher education. Of course, financial and credit institutions have a practice of training new employees, but higher level managers must have specialized higher education. Threats to the personnel component of the economic security of a financial and credit institution, from the point of view of the negative trend in the qualifications of employees, are manifested in the following:

- inefficient work of the department due to delay in data processing/operations by an unqualified person;

- technical errors in data collection and processing;
- wrong design information through incomprehensionfullness of the data array;
- carelessness in data processing and input, which leads to the loss of financial resources;
- low level/absence of internal social responsibility in relation to the team and the institution as a whole;
- an ineffective system of motivating such employees, which ultimately leads to staff turnover.



Rice. 2.11. Dynamics of the number of graduates of higher education institutions in relation to the total population of Ukraine in 2010-2021

Source: compiled by the author based on data [118].

To ensure proper personnel security, it is necessary to use modern personnel technologies, such as: an effective motivation policy, quick adaptation through the introduction of mentoring, timely elimination of conflict situations, compensation, conducting attestations, spreading the understanding of corporateness.

Personnel management methods of the institution, which are aimed at ensuring a high level of economic security, must first of all have a clear understanding of the organization of the system of selection of employees, the process of hiring, training and the application of motivational levers of work, both material and

moral character.

The threat to the personnel component of the economic security of financial and credit institutions, from the point of view of education, continues to intensify since 2015. The decrease in population itself has a negative impact on the economic security of financial and credit institutions from the point of view of the institution's staffing potential, not to mention their qualifications.

Proceeding from the tendency to increase the level of labor migration of the population of Ukraine, the reduction of the level of education and the general decrease in the number of the population - this is the basis for the emergence of threats to the personnel potential of financial and credit institutions. After all, this is manifested not only in the shortage of highly qualified workers, but also in the fact that they prefer employment abroad.

According to the analysis of the components of the economic security of financial and credit institutions, at the current stage of the development of the economy and society, we propose to single out the following as the main threats:

- unfair competition;
- leakage of confidential information;
- decrease in lending and deposit operations;
- fraud, cyber attacks;
- insufficient level of asset quality;
- loss of customers;
- attackers' attacks on offices;
- criminal actions of the staff of the institution;
- weak market position compared to other types of financial institutions;
- increase in the share of non-performing loans;
- insufficient security customers (in pawn shop activity it applies to collectors);

- consumers have limited access to information about the activities of institutions;
- lack of branches to increase the number of customers;
- fierce competition from other financial institutions.

Financial and credit institutions can secure their activities through the use of alternative energy sources, such as solar panels. Such technologies will reduce the likelihood of threats to the institution's financial activity, since solar electricity is much cheaper to use, and its surpluses can be sold at a "green tariff". Also, the presence of its own energy resource ensures full autonomy of the institution and independence from city energy resources. Financial and credit institutions conduct all their operations with the help of computer equipment using programs and services. A slight violation of the integrity of work, associated with even a short-term power outage, will have a negative impact on the economic security of a financial and credit institution.

An appropriate policy of a financial and credit institution to ensure the energy component of security will ensure competitive advantages in the market while minimizing threats to the operational activity of the financial and credit institution, threats to its image and threats to financial performance.

The economic realities in which financial and credit institutions of Ukraine conduct their activities are the basis for the emergence of numerous types of threats to their economic security and effective work.

The difficulty of characterizing threats to the economic security of financial and credit institutions is explained by the evolution of the financial system. Accordingly, the demand for innovative types of goods and services contributed to the emergence of a fairly wide range of various types of financial intermediaries.

Taking into account the specificity of the activities of financial intermediaries, new, non-traditional forms of threats arise, which are inherent only to them. However, there are also threats characteristic of all financial and credit institutions, which do not depend on the peculiarities of their functioning. Taking this into account and based on the results of the analysis

environment of the functioning of financial and credit institutions, it is advisable to outline the list of threats that are currently relevant.

Therefore, according to the results of the assessment, threats such as:

- excessive inclination to accept financial risks;
- instability of the hryvnia exchange rate;
- lack of sources of financing activities;
- decrease in the level of business reputation;
- decrease in the level of public trust in financial and credit institutions;
- shortage and low quality of assets;
- loss, damage, corruption, theft of information;
- fraud by customers and staff;
- low qualification of personnel (including the absence of specialists in the

management of economic security).

Accordingly, taking into account the changes in the financial sector and the emergence of new types of threats affecting the economic security of financial and credit institutions, it is necessary to develop a methodology for ensuring the economic security of financial and credit institutions.

## **2.2. Methodology and tools for assessing the economic security of financial and credit institutions**

Assessing the economic security of financial and credit institutions is an important task facing the management staff of market participants, given the numerous challenges and threats that are constant companions of their activities. The COVID-19 pandemic has become a factor that forced the management of financial and credit institutions to review their policies on ensuring economic security.

The permanent increase in the number of threats to the economic security of PKU forces the administrative management to develop a methodology for assessing economic security to identify and counteract destabilizing factors.

The relevance of the issue of forming a methodical vision in the matter of providing EBFCU is explained by the availability of a wide range of work by scientists on the mentioned issues. Scientists have conducted thorough research on the organization of the system for ensuring the economic security of financial and credit institutions. In particular, a complex and at the same time effective evaluation toolkit of EBFCU has not found its reflection at the moment.

A feature of the economic security of financial and credit institutions is its high dependence on a significant range of factors of external and internal origin. In this regard, the method of assessing the economic security of the PKU is of great importance. It will be the basis for the formation of timely and effective management decisions to solve the task of preventing and eliminating existing/potential threats to the institution's activity.

In the theory of security there are directions for assessing the level of security of social systems. In general, the following directions are distinguished as the main ones [123; 124; 125;]:

- definition marginal values certain set socioeconomic indicators (indicative approach);
- assessment of the level of security threats;
- determination of the degree of protection against threats;
- diagnostics of the external center of activity.

The issue of methods for assessing the economic security of financial and credit institutions combines the views of various scientists. In particular, Kolodizev O.M. and Steyer O.M. [126, p. 70-72] offer an improved methodology for assessing the level of economic security, which consists in the formation of an integral indicator with the possibility for financial and credit institutions to independently determine indicators for each component. Gubareva I.O. [127, p. 68-69] proposes to study economic security according to the most common areas of activity analysis

of financial and credit institutions – analysis of compliance of mandatory economic standards with normative values and coefficient analysis. The proposed approach to analysis is easy to implement and affordable. Assess the borrower's creditworthiness using an assessment system

"CENSOR" is offered by Vasylychak S.V. [128, p. 157]. This system is one of the methods of ensuring the economic security of a financial and credit institution and allows you to form a high-quality investment package and improve the business plan by improving its evaluation.

Regarding the scientific views of other scientists, Moiseyenko I.P. and O.A. Martyniuk [123, p. 40-41] investigate the scoring method for calculating the number of points that are formed based on the results of evaluating financial ratios and indicators. The mentioned technique is based on the threshold values of the selected indicators, which describe the destabilizing factors of influence on the economic security of the PKU. However, the question of studying the degree of influence of individual indicators on the resulting basis for the formation of an effective set of measures to ensure the economic security of financial and credit institutions remains open.

According to the scientific approach of scientists, economic security is evaluated in three stages: formation of an information base for diagnostics, determination of indicators for the analysis of the activity of a financial and credit institution, comparison of actual and normative values of indicators. Scientists have not presented which components are included in economic security and indicate only the indicators of the financial component, which is an incomplete representation for the analysis of the economic security of financial and credit institutions.

Modern scientific research provides a fairly broad base of methods for analyzing the activities of financial and credit institutions. But it is worth noting that not all of the proposed methods can be implemented in the methodology of assessing the economic security of financial and credit institutions. An interesting point is also that quite a significant part

research concerns the issue of assessing the level of economic security of banks, leaving aside other important market subjects.

According to the scientific opinion of O. I. Baranovsky, the completeness, effectiveness and timeliness of management measures to prevent and prevent existing or potential threats directly depends on the extent to which an adequate assessment of the existing level of security of the institution is carried out [30, p. 14].

The approach to ensuring the economic security of business entities is based on the assessment of the financial component according to the scientific views of O.M. Pidkhomny. and Yastrubetska L.S. [129, p. 74]. According to the scientific approach, the financial component is evaluated by cash flows in terms of types of financial and economic activity of the subject.

As for determining the level of economic security of the bank, Z. Vasylychenko and I. Vasylychenko [130, p. 39-40] proposed a methodological approach to assessing its level. Scientists offer a well-founded concept of a single integral indicator containing parameters with the most accurate characteristics of the results of the bank's activity. According to the researchers' scientific point of view, it is noted that when determining the dynamics of the indicator, it is possible to fully and completely have a real idea of the bank's financial condition, which will allow timely response to threats and the implementation of appropriate management decisions. But the proposed approach is based on the results of the assessment of the financial condition of the financial and credit institution, without taking into account other components of economic security.

In methods of assessing the level of economic security of financial and credit institutions, it is common to use the method of analyzing and processing scenarios, which allows for multivariate situational analysis based on the results of forecasting probable scenarios. It is appropriate, within the limits of this method, to carry out calculations by means of economic and mathematical modeling. It is worth noting that when using the specified method, it becomes possible to predict the effectiveness of the decisions of the subjects of security management, to make the best possible decisions.

It should be noted that the use of methods of multidimensional statistical analysis makes it possible to calculate the characteristics of the dynamics of the development of indicators of the economic security of financial and credit institutions. They are based on patterns of changes in statistical data that have taken place in the past. Taking the specified methods as the basis of methodological support for work in the process of assessing the level of economic security of the PKU is almost the most acceptable and expedient. This opinion is based on the fact that the category "economic security" is multifactorial. This means that economic security, as already noted, is dependent on a wide array of factors and factors (of a qualitative and quantitative nature), develops in a historical aspect and incomparable indicators.

Methods of cluster analysis will allow gradation of levels of economic security and clustering of PKU. After performing the clustering of the studied subjects for several periods, as a result, it is possible to determine the stability of the gradation of the levels of their economic security.

An indicative method of diagnosing the bank's financial security is presented in the research of N.S. Riznyk, which compares the actual and threshold values of the indicators. The presented analysis makes it possible to determine the state of security of the institution in accordance with the approximation of its level to the state of security, risk, threat or danger [131, p. 198-199]. The author notes a list of relevant indicators for analysis with further determination of the level of financial security. The equating of the results of the analysis of indicators is based on reducing them to one form from 0 to 1, where 0 is the most critical state, and 1 is the extreme ideal state of economic security. The specified approach will be relevant in the study of the financial component of the economic security of financial and credit institutions.

Regarding the qualitative assessment of the level of financial security, scientists [132, p. 41-44] an expert assessment by means of a questionnaire is proposed, which in our opinion is quite appropriate. The survey is conducted by an expert on the activities of a specific institution. It can be a representative of senior management,

head of the bank's division. Depending on the number of points received, several levels of the bank's financial security are presented: 25–30 – high level; 20–25 is a sufficient level; 15–20 – low level; less than 15 is a critical level. In our opinion, it is better to use questionnaires when studying the qualitative components of the economic security of the PKU, which cannot be determined quantitatively.

Having analyzed the existing approaches, concepts, methods and indicators for assessing the level of bank economic security, it can be stated that currently there is no single, generally accepted methodology and system of indicators for determining the level of their economic security. Moreover, a significant part of the methods is based on the analysis of the financial results of the institution's activity and its profitability. Of course, financial results are the most important in determining the safe operation of an institution, but other qualitative components of economic security are no less important.

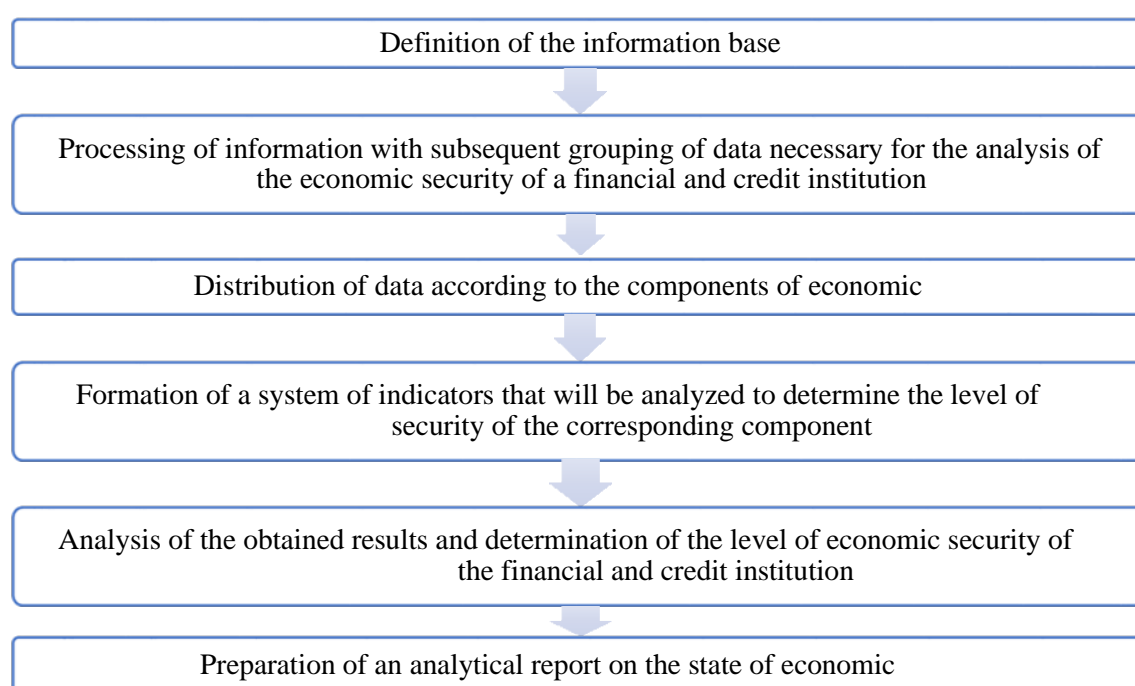
Considering the importance of qualitative and quantitative parameters for determining the level of economic security of financial and credit institutions, we will try to develop a methodology that will take into account these two categories of indicators.

In accordance with the components of economic security of financial and credit institutions that we have highlighted, indicated in fig. 1.3, for a quantitative analysis we propose to investigate the financial component, and for a qualitative analysis - information, personnel and marketing. From the point of view of the availability of information regarding these components, it is possible to form a methodology for determining the economic security of a financial and credit institution, which will be relevant for use by internal and external users of information.

The activity of a financial and credit institution is defined by law, therefore compliance is a mandatory component, but it is impossible to assess its level without internal documentation of a financial and credit institution. The policy of a financial and credit institution regarding energy provision, that is, the energy component, is its strategic plan and is internal information to which access to external entities is not granted. Material and strength

component and technical-technological are also important components that affect the economic security of the institution, but again, such information is not publicly available. And this is understandable, because the disclosure of data about software or the presence of a security system of the relevant institution gives fraudsters the leverage to gain unauthorized access to the financial and credit institution's material and informational resources.

The process of determining the level of economic security of a financial and credit institution is multi-vector and time-consuming. Therefore, we propose to highlight the main stages of its implementation, which are shown in fig. 2.12.



Rice. 2.12. Stages of assessing the level of economic security of a financial and credit institution

Source: author's development.

The information base for the assessment is determined precisely at the basic, first stage. The sources of information should be the annual and quarterly reports of the financial and credit institution, operational data of the National Bank of Ukraine, statistical data and other publicly available information about the institution. The possibility of involving in the analysis internal data of the institution, which are not freely available, will contribute to a more accurate and detailed analysis.

At the second stage, generalization, processing and selection of the necessary array of data, which will be relevant in the analysis of the economic security of the financial and credit institution, is carried out.

At the third stage, the selected array of data is grouped according to the investigated components of economic security: financial, informational, personnel and marketing.

At the fourth stage, indicators related to economic security are determined and their calculation is carried out.

At the fifth stage, the obtained results are analyzed, the indicators are compared with the normative values, and the dynamics are determined. According to the methodology, the level of economic security of the financial and credit institution is determined.

At the final stage, an analytical report is prepared, which should contain the obtained results of the level of economic security of the financial and credit institution and measures to strengthen/support it.

The assessment of the state of the financial component of the economic security of domestic institutions is carried out by legislatively or normatively regulated mathematical ratios (coefficients that include the "Basic Principles of Effective Banking Supervision" of the Basel Committee on Banking Supervision, performance indicators calculated at the level of the World Bank, the IMF, economic standards of banks' activities of the National Bank of Ukraine), which have defined maximum, minimum or limit normative values, which are regulated by state bodies, as well as a number of informal coefficients used by specialists and financial experts.

For a comprehensive assessment of the level of economic security of financial and credit institutions, it is necessary to have data on the current state and guidelines for further development. Therefore, the definition of the list of indicators of the financial component of the economic security of the PKU involves the definition of: indicators that

characterize the level financial security in general; economic norms of institutions' activity; indicators of the level of profitability and profitability of activity. An effective methodology should combine quantitative indicators of the activity of a financial and credit institution (the financial component of the EBFCU) and demonstrable qualitative (informational, personnel, technical and technological, marketing, material and power, compliance and energy components), which are important in the comprehensive assessment of the level of economic security, financial credit institution.

To analyze the economic security of a financial and credit institution, it is not enough to analyze only its financial component or performance results. For a complete analysis of the economic security of the PKU, a comprehensive analysis of the following components is offered: financial, informational, personnel and marketing.

To assess the level of components of economic security of a financial and credit institution, we will use the methodology of the scoring approach [124; 125], which provides for the calculation of the number of points formed on the basis of the evaluation of the coefficients and indicators of the activity of the financial and credit institution.

In order to determine the level of economic security of a financial and credit institution, we will use formula 2.1 and the Harrington scale. Therefore, the economic security of a financial and credit institution will be determined by the formula:

$$EB = F + I + K + M, \quad (2.1)$$

where EB – economic security FKU

F – financial component;

And - informational

component; K – personnel

component;

M is a marketing component.

In order to adequately determine the level of economic security, the resulting indicator will be evaluated according to the Harrington scale. According to the multi-integral discrete numerical scale, the economic security of a financial and credit institution can receive one of the specified levels:

- very high (0.8 - 1.0);
- high (0.63 - 0.8);
- average (0.37 - 0.63);
- low (0.2 - 0.37);
- very low (0 - 0.2).

Edwin Harrington's original desirability function approach was first proposed in 1965 as a method for evaluating product quality. The scientist noted that the quality of industrial products is not determined by one characteristic. He characterized quality as a composition of interconnected characteristics that are almost always measured in different units" [133, p. 495]. The economic security of a financial and credit institution has the same multifactorial definition, since its completeness and accuracy is related to the analysis of its components. That is why we see Harrington's scale as relevant for determining the level of economic security of FKU.

Accordingly, after calculation according to formula 2.1, the indicator of economic security of a financial and credit institution can have a value from 0 to 4. We consider it appropriate, for the ease of using the Harrington scale, using a mathematical proportion to determine exactly which results will correspond to the proposed 5 levels of economic security:

- very high (3.2 - 4.0);
- high (2.52 - 3.2);
- average (1.48 - 2.52);
- low (0.8 - 1.48);
- very low (0 - 0.8).

Based on the analysis of scientific works [125; 134; 135; 136; 137], we suggest using the indicators summarized in table 2.2 when evaluating the financial component.

Table 2.2

Indicators/coefficients of assessment of the level of the financial component of the economic security of banks

Conditional marking	Name	Normative/recommended value
H1	Regulatory capital (RC)	At least UAH 200 million
H2	Norm of sufficiency of the RC (adequacy)	At least 10%
H3	Norm of adequacy of fixed capital	At least 7%
H6	Short-term liquidity standard	At least 60%
H7	Norm of the maximum amount of credit risk per counterparty	Not more than 25% for systemically important banks - no more than 20%
H8	Norm of large credit risks	No more than 8 times RK size
H9	The norm of the maximum amount of credit risk for operations with persons connected with the bank	Not more than 25%
H11	Norms for investing in securities separately for each institution	Not more than 15%
H12	Norm of the total amount of investment	Not more than 60%
L13-1	Long open currency position limit	No more than 10%
L13-2	Short open currency position limit	No more than 10%
ROA	Return on assets	At least 1%
ROE	Return on equity	At least 15%
ChPM	Net interest margin	At least 4.5%
PP	Profit per employee	Availability of profit
Rk	Return on capital	Positive value, positive dynamics (at analysis for several periods)
Rb	Cost effectiveness	Positive value, positive dynamics (at analysis for several periods)
Ri	Profitability of other income	Positive value, positive dynamics (at analysis for several periods)

Source: compiled by the author based on [129; 131; 132; 133; 134].

As for credit unions, in 2019, the National Commission for State Regulation of Financial Services Markets approved the Regulation "On Mandatory Financial Norms and Requirements,

which limit the risks of operations with financial assets of credit unions" [138]. In accordance with the Regulation, mandatory financial standards for the activity of credit unions are established. The National Commission ceased its activities in 2020, as its supervisory authority was granted to the NBU. However, the Regulation is still valid and considering that the National Bank of Ukraine has not formulated new mandatory standards for the activity of credit unions, we propose to use the standards stipulated by the Regulation when assessing the financial component of the economic security of credit unions. These standards include:

- normative financial stability (K1) - not less than 10%;
- capital adequacy ratio (K2) - not less than 7%;
- capital reserve buffer (B) - above the regulatory value of the capital adequacy standard (K2);
- credit risk ratio (K3) - no more than 25;
- credit risk concentration standard (K4) - no more than 3;
- liquidity reserve ratio (K5) - more than 0.

More difficult is the question of determining indicators and coefficients for assessing the level of the financial component of the economic security of pawnshops. Considering that the powers of the regulator for the activities of pawnshops were granted to the NBU only in 2020, and before that the regulatory body did not envisage the application of mandatory standards to their activities, the use of standards in the methodology is impossible due to their absence.

We consider it expedient to use the profitability coefficients given in the table to assess the level of the financial component of economic credit unions and pawnshops. 2.2.

According to the selected indicators proposed by us for assessing the level of the financial component of economic security of banks, if the indicator corresponds to the normative value and has positive dynamics, it

1 point is awarded. If the normative value is not reached - 0 points. With this approach, the maximum number of points for the financial component is 18 points. As for credit unions and pawnshops, the maximum number of points for the financial component is 11 points and 5 points, respectively.

In order to equate the obtained rating points of the coefficients to the single scale of effectiveness, which will be used in formula 2.1, we will use a mathematical proportion. According to the proportion, 1 received rating score is equal to a weighting factor of 0.055. Therefore, the maximum number of points obtained during the study of the financial component of the economic security of the FCU is 18, which, accordingly, has a weight of 1, as a high level of economic security. The distribution of points is given in table 2.3.

Table 2.3

The level of the weighting coefficient of the financial component of the economic security of the FKU

Banks		Credit unions		Pawn shops	
The number of points received	The level of the financial component	The number of points received	The level of the financial component	The number of points received	The level of the financial component
16-18	1	10-11	1	5	1
11-15	0.825	7-9	0.81	4	0.8
6-10	0.55	4-6	0.54	3	0.6
1-5	0.275	1-3	0.27	1-2	0.4

Source: author's development

The information component of the economic security of financial and credit institutions is based on the principles of confidentiality, integrity, availability and security, which ensure uninterrupted and reliable operation of information systems. In accordance with today's issues and challenges facing financial and credit institutions, customer requirements and their wishes, a list of indicators for analysis with the corresponding distribution of rating points is proposed to assess the level of the information component (Table 2.4).

Table 2.4

Indicators of assessment of the level of the informational component of  
economic security financial and credit institution

Indicator for analysis	Insufficient level, 0 points	Average level, 1 point	high level, 2 points
Availability of complete information about FKU on the website (history of activity, partners, services)	Absent	Incomplete	Constantly updated
Speed of response to card left at the ATM (for banks)	Absent	More than 10 minutes	Up to 10 minutes
Double identification of the user when entering the personal account (password, call)	Absent	Does not always work	Constantly works
Availability of chat bots in messengers (consulting services 24/7)	Missing	Promotion	Successfully work and provide consultations
Verification during operations (confirmation by message, call or login password of the application)	Absent	Only when "atypical" operations	Approval of all operations
Requests from FKU for updates information about the client	Missing	Annually	Quarterly
Ability to generate an electronic digital signature (for banks)	Absent	Under development	Good luck for a year
Presence in the policy institution privacy	Absent	Under development	Successfully implemented

Source: author's development

The maximum number of points that FKU can receive for the informational component is 18 points. For this component, we will determine the following division of points for calculating the level of economic security of a financial and credit institution. According to the mathematical proportion, 1 received point is equal to a weighting factor of 0.055. Therefore, the maximum number of points obtained during the study of the informational component of economic security of the FCU is 18, which, accordingly, has a weight of 1, as a high level of economic security. The distribution of points is given in table 2.5.

Table 2.5

The level of the weight factor of the informational component of the economic security of the FCU

The number of points received	The level of the information component
16-18	1
11-15	0.825
6-10	0.55
1-5	0.275

Source: author's development.

The marketing component of the economic security of a financial and credit institution is proposed for evaluation, because in the era of digitalization, informationization and multifaceted possibilities of the Internet, the Internet plays an important role both in attracting the client base and in maintaining the image. For the analysis of the specified component, we offer the characteristics for analysis listed in Table 2.6.

Table 2.6

Indicators of assessment of the level of the marketing component of economic security financial and credit institution

Indicator for analysis	Insufficient level, 0 points	Intermediate level, 1 point	high level, 2 points
Presence of "page" FKU in social networks with advertising of services	Absent	Invalid	Constantly updated
The work of chat bots in messengers	Missing	Promo version	They work successfully and provide consultations
Online application	Missing	Promo version	Works successfully and provides services online
Advertising campaign on on television/on the Internet	Absent	Less than 5 advertising videos per week	More than 5 advertising videos per week
Ease of perception by users of the FKU site (color gamut, for people with visual impairment)	Complex	It is difficult to visually determine the necessary information	All important "tabs" are highlighted and easily accessible
Cooperation with other companies for joint engagement customers	Absent	One partner	More than 2 partners
Availability of a souvenir products	Absent	Available but only several species	Wide assortment

Source: author's development.

The maximum number of points that FKU can receive for the marketing component is 14 points. For this component, we will determine the following division of points for calculating the level of economic security of a financial and credit institution, according to the mathematical proportion given in table 2.7.

Table 2.7 The level of the weighting factor of the marketing component of the economic security of the PKU

The number of points received	The level of the marketing component
13-14	1
9-12	0.84
5-8	0.56
1-4	0.28

Source: author's development

The personnel component of the economic security of the FCU is presented for analysis, since human potential in all its manifestations has a decisive role in ensuring the integrity, perspective and safe operation of a financial and credit institution.

The proposed list of signs is given in table. 2.8, will allow to investigate and determine the personnel component for further determination of the level of economic security of the PKU.

Table 2.8

Indicators/coefficients of the assessment of the level of security of the personnel component

Indicator for analysis	Insufficient level, 0 points	Average level, 1 point	high level, 2 points
Personnel turnover	High	average	low
Expenses of the institution on courses/seminars for employees	Missing	Insignificant	Weighty and annual
Frequency of board change	Often	Periodically	Rarely
Mandatory higher education at employment	Absent	Not necessarily	Necessarily
Mandatory work experience with employment	Absent	Not mandatory	Mandatory
Mandatory ownership in a foreign language by employees	Absent	Not mandatory	Mandatory

Source: author's development

Maximum number points which maybe get FKU by

HRcomponent - 12 points. For this component, we define the following division of points for calculation equal economic security financial and credit institutions, according to the mathematical proportion given in table 2.9

Table 2.9

The level of the personnel security weighting factor

The number of points received	The level of personnel
10-12	1
7-9	0.72
3-6	0.48
1-2	0.16

Source: author's development

As a result of evaluating the components of the economic security of the PKU, we receive a total number of points for each of them and have the opportunity to determine the level of economic security of the financial and credit institution, according to formula 2.1.

The proposed scoring method in the formation of a score rating of the components of the economic security of the FCU with the subsequent determination of the level of economic security of the financial and credit institution according to the Harrington scale will be relevant for financial and credit institutions. Its essence is a combination of quantitative and equally important qualitative indicators. This technique will make it possible to assess the overall economic security of a financial and credit institution. And taking into account the separate calculation of each of its components, a detailed analysis and identification of the components that had the most significant influence on the formation of the resulting value is provided.

In order to have a comprehensive assessment of the level of economic security of a financial and credit institution, it is proposed to apply mathematical forecasting methods to the proposed method of determining the economic security of a financial institution, which, according to scientists, are mandatory [139].

In order to form an effective set of measures to prevent threats and minimize their impact on the economic security of financial and credit institutions, it is proposed to use a predictive mathematical model of exponential smoothing and an adaptive Brown model, which are considered by scientists [140, p. 83-84].

Ensuring the real achievement of economic security of a financial and credit institution is carried out thanks to the continuous process of measuring and evaluating the actual results of activities and their comparison. This is a necessary condition for the implementation of specific measures to control, prevent losses and ensure the economic security of the institution.

In addition to obtaining future estimates of the studied parameters, the goal of forecasting is the analysis of future scenarios when implementing forecasts in the future and determining the resulting consequences. Therefore, forecasting allows not only to reduce possible risks, but also to significantly improve the quality of management and ensure prompt response to potential changes.

Considering that the forecast is based on the assessment of the actual state of the financial and credit institution, and the plan is based on the forecast of future changes in operating conditions, there is a constant need to control and analyze the main current indicators and forecast their changes in the future. Therefore, the forecast must be revised according to updated information, which will require the introduction of appropriate changes in previously approved plans and programs.

Thus, forecasting is a basic management function and an effective tool for ensuring the economic security of the institution.

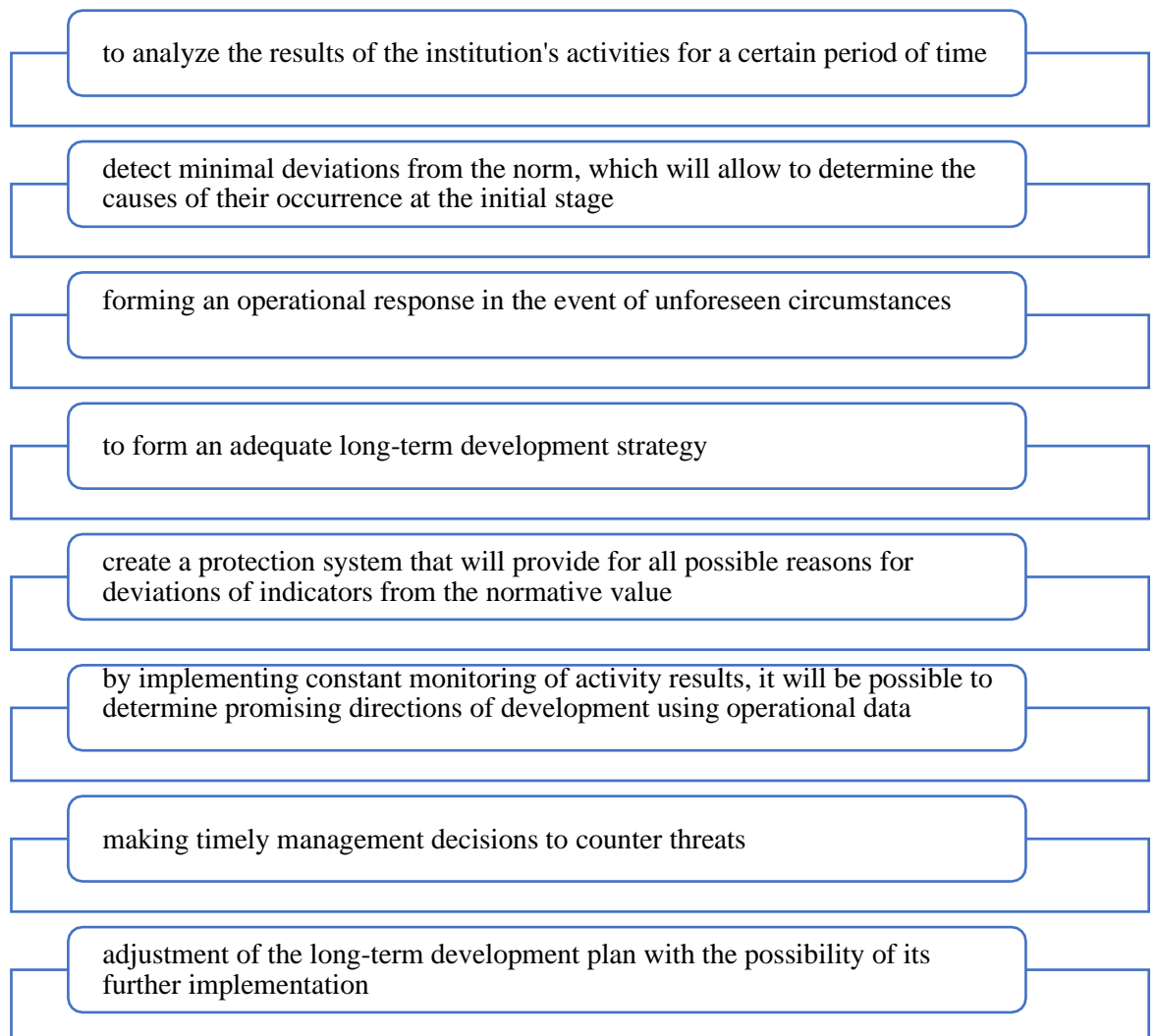
In the system of economic security of a financial institution, taking into account the realities of today (unfair competition, pandemic, low motivation of personnel, unsuccessful information policy), forecasting occupies an important place. The application of forecasting methods in the system of ensuring economic security of the PKU will allow to obtain many advantages, which are shown in fig. 2.13.

First of all, let's dwell on the usual, acceptable for all understanding of the functions of forecasting and the features of its implementation in conditions of uncertainty. Usually, the following forecasting functions are distinguished:

- information and analytical function, which involves the collection and primary processing of various sources of information (both official and indirect) regarding the level of various macro-financial indicators of the state and trends of the level of development of the institution during a certain defined period of time.

The main essence of primary processing is checking the reliability of information on macro-financial indicators, systematization, structuring and comparison;

- identification and warning function - aims to detect possible hidden threats;
- the regulatory function is to develop measures that make it possible to assess hazards. The main goal is to eliminate identified deficiencies and develop measures to improve stability data;
- advisory function – the possibility of considering alternative and multivariate measures that are developed as a result of identifying threats with the aim of preventing them and/or minimizing their consequences.



Rice. 2.13. Advantages in application prognostication in securityeconomic security of FKU

Source: author's development.

That is why, in order to make the necessary management decisions in order to ensure the appropriate level of economic security of a financial institution, it is necessary not only to assess the current state, but also to forecast the possible "scenario" of the institution's activities.

Building a model based on exponential smoothing is the best option for a forecast model when there are data for several periods (months, days, weeks, quarters) and it is not yet clear whether there is an upward or downward trend.

When performing forecasting on the basis of exponential smoothing, the general level of economic security of the financial and credit institution will be analyzed and its forecast for the next period will be made. In order to obtain more reliable data in the next period, it is also suggested to apply an adaptive model.

When conducting short-term forecasting or changing external conditions, with the greatest significance of the latest implementations of the studied process, adaptive forecasting methods are the best, since they take into account the inequality of the levels of the time series.

Adaptive models of forecasting (data discounting) have the ability to quickly adjust structural parameters in accordance with changes in essential conditions. In such models, the forecasting tool is a mathematical model with a one-of-a-kind factor - "time". In the process of estimating the parameters of the model, the levels of the series are given their respective weights. The magnitude of the weights depends on the degree of their influence on the current level. It is this that makes it possible to take into account changes in trends, minimal fluctuations that have a regularity in their nature. Adaptive models have two schemes: moving average (CC-model) and autoregression (AR-model).

According to the moving average scheme, the weighted average of the previous levels is the basis for evaluating the current level. According to the scheme, weights during observations decrease depending on the distance to the last level. In general, this is explained by the fact that the informational value of observations is

significant when it has the closest location to the final observation interval. These models reflect changes in the trend well, but cannot reflect fluctuations.

In the models (SS scheme), the reaction to the error of discounting the time and forecast levels is determined by the smoothing (adaptation) parameters, the value of which varies from 0 to 1. A high value of the parameters (over 0.5) means a high level of weight of the last level of the series, and a low value (less than 0.5) - preliminary observations. The first case corresponds to rapidly changing dynamic processes, the second to more stable ones.

Brown's model refers to adaptive forecasting models, which can change its structure and parameters, adapting to changing conditions.

The advantage of using Brown's adaptive forecasting model is to take into account the inequality of time series data - the priority of recent implementations. The model allows you to take into account changes in trends, as well as any fluctuations in which a pattern can be traced. Thus, an adequate system of short-term forecasting, theoretically justified and practically significant, has been developed.

The problem of measuring the economic security of a financial and credit institution is gaining importance. The completeness, timeliness and effectiveness of administrative measures to eliminate, counteract and prevent all possible types of threats depend on an adequate assessment of the current state of economic security of a financial and credit institution.

Taking into account the instability of the external environment, the pandemic, the socially anxious situation of the population, uncertainty about the future, ensuring the economic security of financial and credit institutions reaches a completely different level. So, as a component of the proposed methodology for assessing the economic security of financial and credit institutions is forecasting, analytical work begins to play the main role. It is extremely important to control the sources of information and the methods according to which it was obtained

analytical data. After all, misinformation can lead to greater consequences than untimely detection of threats.

### **2.3. Assessment economic security domestic financial credit institutions**

The unpredictability and aggressiveness of the external environment encourages development effective tools software economic financial and credit security institutions Building economic and mathematical assessment models, analysis, prognostication and management economic safety there are an actual task that requires various approaches and methods of solving.

Diagnostics of the level of economic security of a financial and credit institution may differ in terms of goals and methodology. The study of management systems is possible only with the understanding of such sciences as: economic and financial analysis, management, economic-mathematical modeling, analysis of complex socio-economic systems under conditions of uncertainty [141, p. 27-28].

The formation of information and analytical support for the economic security of business entities determines the application of models of economic and financial analysis. Models are used in the study of the use of material and intellectual resources, which are effective analytical tools.

The methods of analysis of economic parameters described in the studies reflect the stability of the financial state of the PKU in the long term in the conditions of changes in the external and internal environments and the degree of financial independence. Such assessments provide only the ability to withstand the negative effects of external and internal environments, but do not provide for the identification and neutralization of threats, reduction of undesirable consequences, etc.

Thus, most of the existing methods of determining the level of economic security of PKU use traditional parameters of determination based on methods of economic and financial analysis.

According to our proposed methodology for assessing the level of economic security of a financial and credit institution, not only the financial component of security is analyzed, but also the informational, personnel and marketing components. Therefore, we will evaluate the level of economic security of PKU according to the scoring approach in order to determine the relevance and expediency of applying the specified approach.

The method of the scoring approach is relevant for use in assessing the level of economic security of banks, pawnshops and credit unions. But taking into account that banking institutions occupy the largest share of the financial sector market, and credit unions and pawnshops are regulated by the NBU starting from July 1, 2020, and some issues of their activity are not agreed upon, we consider it expedient to test the methodology based on the results of the banks' activities.

5 banking institutions were chosen to assess the level of economic security:

- systemically important banks - state bank JSC "Ukreximbank"; bank with foreign capital JSC Raiffeisen Bank Aval; bank with private capital JSC "First Ukrainian International Bank" (PUIB);
- a bank with private capital JSC "Poltava-bank";
- bank with private capital JSC "KB Zemelnyi Kapital".

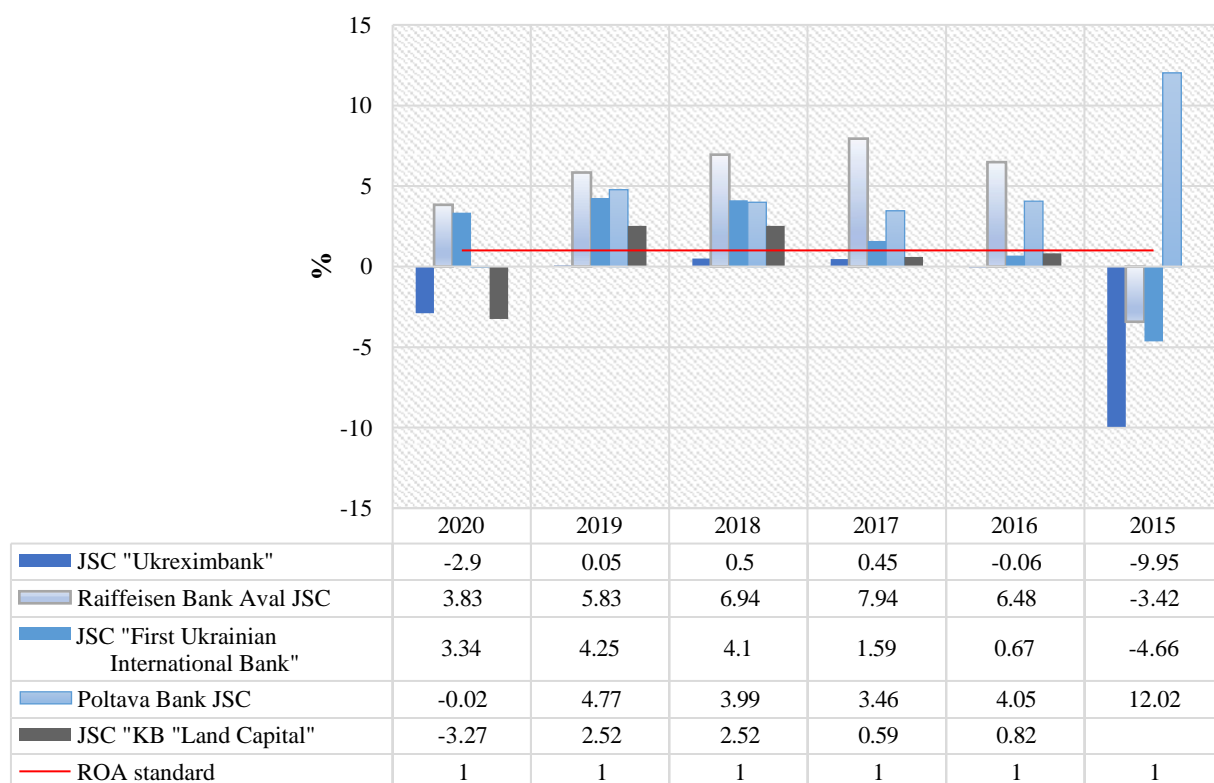
According to the defined list of indicators and characteristics necessary for the analysis of the financial, informational, personnel and marketing component of the economic security of the FCU, they were examined for each of the specified banks.

First, we will analyze the results of the activity of the selected banks according to the indicators of the financial component of economic security. The results of the analysis are given in table. K1-K5 (Appendix K).

According to the obtained results of the analysis, it can be said that the systemically important banks of Ukraine and JSC "Poltava Bank" comply with the requirements

mandatory economic standards. The largest share of non-compliance with regulatory requirements in JSC KB "Land Capital" in 2020. Such dynamics in the bank are related to the unstable economic and social instability in the country and the world, which was associated with the pandemic.

Regarding the analysis of the results of the banks' activities according to other selected indicators, JSC "Ukreximbank", JSC "Poltava Bank" and JSC "KB "Land capital" has problems with compliance with the regulatory value of return on assets and return on equity in 2020 (Fig. 2.14). This is the result of the negative impact of the pandemic on the activities of institutions. JSC "Raiffeisen Bank Aval" and JSC "First Ukrainian International Bank" were the more prepared institutions, which complied with the normative values during the studied periods.



Rice. 2.14. Dynamics of the profitability of the studied banks' assets from 2015 to 2020

Source: compiled by the author.

The analysis of the information, marketing and personnel components of the economic security of the FCU was carried out based on the results of research and study of the information base of each bank, their information policy, reporting and other official documents, data from the official website of the bank and the NBU, information from mass media.

According to the results of this analysis of the components of the economic security of the PKU, according to each of them the distribution of points was carried out, as shown in the table. L.1, tab. M.1, tab. H.1, tab. P.1 (appendices L, M, H, P). According to the scoring approach, the financial component of the economic security of FKU could receive a maximum of 18 points, the informational component – 16 points, the marketing component – 14 points, and the personnel component – 12 points. According to the presented methodology, the obtained rating points of the studied coefficients are equated to a single performance scale, according to which the maximum number of points for each component of economic security of the FKU is 1. Then, according to the mathematical proportion, the points are equated to the coefficient scale. Each component has its weight value of each point, so 1 rating point of the financial component is 0.55; 1 point of the informational component – 0.55; 1 point of the marketing component – 0.07; 1 point of the personnel component is 0.08. According to the specified division, a scale was formed according to which the corresponding total number of points is equal to the corresponding coefficient value. The results of the calculations are given in the table. 2.9.

Table 2.9

Security levels of financial and credit components of economic security  
institutions according to the received points

	Year	FS	Level	IS	Level	MS	Level	CS	Level
	JSC "Ukreximbank"	<b>2020</b>	13	0.825	16	1	13	1	8
<b>2019</b>		13	0.825	16	1	13	1	8	0.72
<b>2018</b>		14	0.825	16	1	13	1	7	0.72
<b>2017</b>		14	0.825	16	1	13	1	7	0.72
<b>2016</b>		11	0.825	11	0.825	12	0.84	8	0.72
<b>2015</b>		9	0.55	9	0.55	10	0.84	8	0.72

Continuation of table 2.9

Raiffeisen Bank Aval JSC	<b>Year</b>	FS	Level	IS	Level	MS	Level	CS	Level
	<b>2020</b>	18	1	16	1	14	1	11	1
	<b>2019</b>	18	1	16	1	14	1	10	1
	<b>2018</b>	18	1	16	1	14	1	11	1
	<b>2017</b>	18	1	16	1	14	1	10	1
	<b>2016</b>	18	1	15	0.825	14	1	10	1
	<b>2015</b>	12	0.825	14	0.825	12	0.84	10	1
JSC "First Ukrainian International Bank"	<b>Year</b>	FS	Level	IS	Level	MS	Level	CS	Level
	<b>2020</b>	16	1	16	1	14	1	11	1
	<b>2019</b>	17	1	16	1	14	1	10	1
	<b>2018</b>	17	1	16	1	14	1	12	1
	<b>2017</b>	17	0.825	15	0.825	14	1	10	1
	<b>2016</b>	14	0.825	14	0.825	13	1	10	1
	<b>2015</b>	11	0.825	13	0.825	12	0.84	10	1
Poltava Bank JSC	<b>Year</b>	FS	Level	IS	Level	MS	Level	CS	Level
	<b>2020</b>	14	0.825	12	0.825	10	0.84	8	0.72
	<b>2019</b>	18	1	12	0.825	10	0.84	8	0.72
	<b>2018</b>	17	1	11	0.825	10	0.84	9	0.72
	<b>2017</b>	17	1	12	0.825	9	0.84	9	0.72
	<b>2016</b>	16	1	9	0.55	8	0.56	9	0.72
	<b>2015</b>	18	1	9	0.55	8	0.56	9	0.72
JSC "KB "Land capital"	<b>Year</b>	FS	Level	IS	Level	MS	Level	CS	Level
	<b>2020</b>	9	0.55	1	0.275	2	0.28	6	0.48
	<b>2019</b>	16	1	1	0.275	2	0.28	6	0.48
	<b>2018</b>	15	0.825	1	0.275	2	0.28	6	0.48
	<b>2017</b>	15	0.825	0	0	2	0.28	7	0.72
	<b>2016</b>	15	0.825	0	0	2	0.28	7	0.72

Source: calculated by the author

As a result of grouping the obtained points according to each of the studied components of the economic security of the FCU, we calculate the level of economic security of banks according to formula 2.1. The obtained integral indicator characterizes the level of economic security of the respective bank. The summarized results of the analysis for each bank are shown in the table. 2.10 indicating the determined level of economic security.

Table 2.10

## The level of economic security of the studied banks

Bank/year	2015	2016	2017	2018	2019	2020
JSC "Ukreximbank"	2.66	3.21	3,545	3,545	3,545	3,545
	High	Very high	Very high	Very high	Very high	Very high
JSC "RaiffeisenBank Aval"	3.49	3,825	4	4	4	4
	Very high	Very high	Very high	Very high	Very high	Very high
PUMB	3.65	3.65	3.65	4	4	4
	Very high	Very high	Very high	Very high	Very high	Very high
Poltava Bank JSC	2.83	2.83	3,385	3,385	3,385	3.21
	High	High	Very high	Very high	Very high	Very high
JSC "KB "Land capital"	Missing report	1,825	1,825	1.86	2,035	1,585
	Missing report	average	average	average	average	average

Source: calculated by the author

According to the conducted analysis, the investigated banks have a very high level of economic security, except JSC "CB "Land Capital". The said bank has a volatile position, which finally in 2020 decreased to the lowest level for all the years under study and is 1.585 and is close to the low level of safety.

For all studied banks, the lowest level of economic security is observed in 2015. This is explained by the consequences of the economic crisis that began in 2014. Regarding the results of the security level of banks in 2020, systemically important banks and JSC "Poltava Bank" adhere to the position of maintaining a very high level of economic security, except JSC "KB "Land Capital".

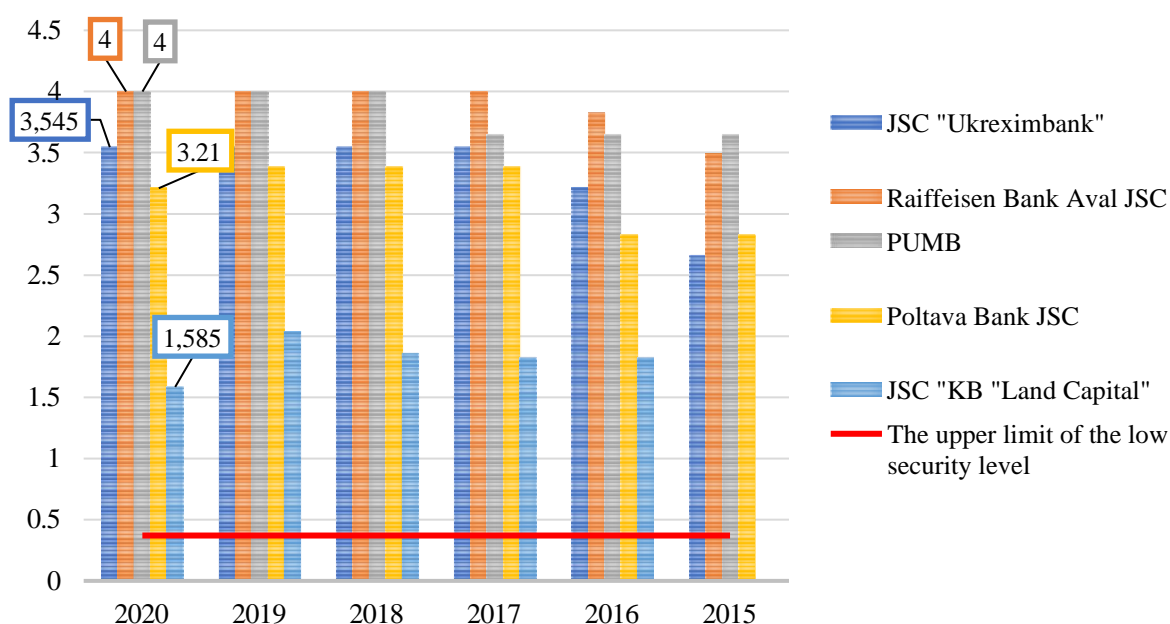
At the end of 2019, the world economy faced an unprecedented challenge - COVID 19. The pandemic affected absolutely all aspects of people's lives and all sectors of the economy. As a result, banking institutions that are provided with a sufficient level of resources have a balanced credit policy,

a wide client and partner base, appropriate information and technological equipment quickly adapted to changes in the economy. This allowed them to maintain their profitability, operational efficiency and prospects for further development, even during the pandemic. Such positive trends, according to the conducted research, are observed in JSC

Ukreximbank, JSC Raiffeisen Bank Aval, FUIB and JSC Poltava Bank (Fig. 2.15). JSC "KB "Land Capital" was unprepared for such a challenge, as it had an insufficient level of ensuring the security of the components of economic security, especially the information and marketing components, which play an important role in the era of informatization. This is confirmed by the decrease in the level of economic security of the bank in 2020.

Considering that the financial component of the economic security of the FCU is the most important, we suggest combining the results of calculating the indicators of this component with the effective indicator - the level of economic security.

In order to study the relationship between the economic security of the bank and its financial component, it is advisable to use the correlation matrix. The main task of the matrix consists in the analysis of existing statistical data between the studied features with further determination of the density of the relationship.



Rice. 2.15. The level of economic security of banks in the period from 2015 to 2020

Source: compiled by the author.

Accordingly, based on the results of the assessment of the financial component of the economic security of the studied banks, correlation matrices were formed for each of them. The indicated results are presented in tables P1.- P.5 (Appendix P). After cleaning the matrix to determine dense types of connections (more than 0.5), a table was formed. 2.11.

Table 2.11

Dense types of connections between indicators of the financial component and economic security of banks

Bank/ indicator	JSC "Ukreximbank"	Raiffeisen Bank Aval JSC	PUMB	Poltava Bank JSC	JSC "KB "Land capital"
H1	0.93	0.98	0.91	0.62	-
H2	0.83	-	0.95	-	-
H3	0.88	-	0.82	-	0.54
H6	-	-0.53	-	-	-
H7	-	-0.85	-0.99	-	-
H8	0.56	-0.70	-0.97	-	-0.95
H9	-	-0.76	-	-	0.53
H11	-0.68	-	0.76	-0.5	-
H12	-	-	-0.76	-0.5	-
L13-1	0.55	-	0.72	-0.57	-
L13-2	-0.55	-	-0.91	-	-
ROA	0.90	0.90	0.87	-	0.92
ROE	-	0.98	0.91	-0.58	0.94
ChPM	-0.50	-	0.92	0.71	-
PP	0.87	0.98	0.93	-	0.94
Rk	-	0.95	0.80	-	0.94
Rb	0.85	0.89	0.83	-	0.93
Ri	0.54	-	-	-	-

Source: calculated by the author

Based on the obtained data of correlation matrices, it can be summarized that indicators of the financial component of economic security affect the EB with different strength. Even taking into account the single external environment of the studied institutions, banks have different "reactions" to threats.

A strong positive relationship between economic standards and profitability indicators can be traced in the investigated bank JSC "Ukreximbank". Corresponding demonstratives have a positive dynamic towards growth

and are in the relevant regulatory field. A very strong connection can be traced between the profit per employee and the resulting indicator. The specified connection is connected with the fact that the bank suffered a loss in the last period of the study and this had a significant negative impact on the level of economic security. First of all, this is due to the significant amount of non-performing loans in the bank's loan portfolio (58%), the main share of which was issued before 2014 and the loans of the Autonomous Republic of Crimea.

There is also a feedback relationship between the obtained level of economic security of the bank and the standard of investment and the risk of the total short open currency position. This type of relationship characterizes the positive impact of reducing the specified indicators on the final level of economic security. As for the feedback between the net interest margin, this is explained by the fact that this indicator at the end of the studied period has a negative value (the bank suffered a loss), so the greater the loss, the lower the level of economic security of the bank. Therefore, the bank needs to review its lending policy and conduct a better analysis of potential creditors, with a detailed analysis of their business development plan.

According to the calculations made by Raiffeisen Bank Aval JSC and JSC "First Ukrainian International Bank" received the highest coefficient indicators of the level of economic security. Therefore, it is not surprising that according to the results of the correlation matrix, the investigated indicators of the financial component have a positive effect on the formation of the level of economic security of the bank.

JSC "Raiffeisen Bank Aval" received the maximum number of points for the financial component of the EB, so it can be said that the bank has a completely relevant credit policy, a clear approach to customers and a working business development model.

As for JSC "First Ukrainian International Bank", according to the results of the point assessment, only the norm of the maximum amount of credit risk for operations related to the bank (H9) and the profitability of other income received 0 points. But this is due to the fact that the standard H9 is not

corresponds to the normative value, but has a positive downward trend; the profitability of other incomes has a negative downward trend. According to the analysis of the correlation matrix, these indicators have a weak feedback, so they did not have a significant impact on the formation of the level of economic security of the bank.

According to the results of the analysis of the correlation matrix developed based on the data of JSC "Poltava Bank", there is a direct strong connection between the economic security of the bank and the net interest margin. There is a strong inverse relationship between the performance indicator and the standard of investment in securities, the standard of the total amount of investment, the standard of risk of the total long open currency position and the return on equity. The presence of this type of connection is explained by the fact that in 2020, due to the threats associated with the pandemic, the bank received significantly less profit and, accordingly, the indicated indicators had a negative downward trend. That is why these indicators have a strong influence on the level of economic security of the bank.

As for the results of the analysis of JSC "KB "Land Capital", it has a strong direct relationship with the indicated indicators in table 2.4. and strong feedback in return on equity. The bank suffered a loss in 2020, so it has an unsatisfactory profitability. The average level of the bank's economic security obtained according to the methodology is the confirmation of the mentioned connections.

Summarizing the above, only JSC KB "Land Capital" among all the investigated banks shows a negative dynamic in activity, a strong dependence of the level of economic security of the bank on indicators that characterize the unsatisfactory work of the bank with further aggravation of the existing situation.

As a result of the analysis, the key correlation relationships between the indicators of the financial component of the EB and the economic security of the bank were determined. According to this, each bank has a clear understanding of the impact of each factor on

the level of economic security, according to which the development strategy needs to be adjusted or, conversely, which strategic positions the bank should continue to adhere to.

According to the proposed scoring method for assessing the economic security of financial and credit institutions, mathematical forecasting methods are used to ensure a comprehensive analysis.

For forecasting, we suggest using two predictive models - the exponential smoothing model and the adaptive Brownian model.

Building a model based on exponential smoothing is the optimal option for a forecast model when there are data for several periods and the growth/decrease trend is not yet clearly defined. The forecast is calculated according to the following formula:

$$Y_{t+1}^{\%} = \alpha \cdot Y_t + (1 - \alpha) \cdot Y_t^{\%} \quad (2.2)$$

$Y_{t+1}^{\%}$  – forecast for the next period  $t+1$ ;

$Y_t$  – data for the forecast for the current period  $t$ ;

$\alpha$ - the smoothing coefficient of the series ( $\alpha$  is set manually, has a range of values from 0 to 1);

$Y_t^{\%}$  is the value of the forecast for the current period, and in the first period  $Y_1^{\%} = Y_1$ , i.e.

$Y_1^{\%}$  is equal to sales during this period.

It is important to note that this model involves a regular recalculation of the forecast at the end of the last period and the appearance of new data for the forecast for the last period.

To calculate the accuracy of the forecast at a given value, you need to determine:

- 1) model error. For this, it is necessary to subtract the sales forecast for this period from the actual sales for each observation period;
- 2) square deviation. For this, it is necessary to calculate the ratio of the square of the model error to the square of the forecast for each period;
- 3) standard deviation. It is calculated as the average value of squared deviations for the entire analyzed period;
- 4) forecast accuracy = 1 – Root mean square deviation.

To estimate the optimal value of  $\alpha$ , forecasts are successively calculated at  $\alpha$  equal to 0.1 to 0.9, and the  $\alpha$  is selected at which the value of the accuracy of the forecast will be closest to 100%.

According to the specified algorithm of actions, we will calculate the predicted level of economic security for the studied banks for 2021. The basic value, according to which the forecast will be made, is a coefficient that characterizes the appropriate level of economic security of the bank under study. The indicated data are given in table 2.2.

As a result, with an accuracy of the forecast of 81%, the level of economic security of JSC "Ukreximbank" will be very high, which corresponds to the obtained forecast value of the coefficient - 3.5. (Table 2.12). Taking into account the obtained result, it can be stated that the bank will maintain its stability, work efficiency and further development prospects for the forecasted period.

Table 2.12

## Projected level of economic security of JSC "Ukreximbank"

		Exponential model 1			Exponential model 2			
		$\alpha=$		precision	<b>0.808</b>	$\alpha=$	precision	<b>0.528</b>
			<b>0.8</b>			<b>0.2</b>		
Year	Coefficient	Value	Forecast	Error	Root mean square deviation	Forecast	Error	Root mean square deviation
2015	Value	2.66	0.0	2.7	1,000	0.00	2.66	1,000

Continuation of table 2.12

2016	Value	3.21	2.1	1.1	0.114	0.53	2.68	0.696
2017	Value	3,545	3.0	0.6	0.024	1.07	2.48	0.488
2018	Value	3,545	3,4	0.1	0.001	1.56	1.98	0.313
2019	Value	3,545	3.5	0.0	0.0	1.96	1.59	0.2
2020	Value	3,545	3.5	0.02	0.0	2.28	1.27	0.128
			<b>3.5</b>		0.19	2.53		0.471
				<b>precision</b>	<b>0.81</b>		precision	0.529

Source: calculated by the author

The positive trend towards maintaining the level of economic security of Raiffeisen Bank Aval JSC will be maintained in the forecast period. So, according to the calculations given in the table. 2.13, the bank has a very high level of economic security with a forecast accuracy of 82%, which corresponds to the obtained forecast value of the coefficient - 4.

Table 2.13

### Projected level of economic security of Raiffeisen Bank Aval JSC

		Exponential model 1				Exponential model 2		
		$\alpha=$		precision	<b>0.818</b>	$\alpha=$	precision	<b>0.549</b>
			<b>0.8</b>			<b>0.2</b>		
Year	Coefficient	Value	Forecast	Error	Mean square deviation	Forecast	Error	Mean square deviation
2015	Value	3.49	0.0	3.5	1.0	0.00	3.49	1.00
2016	Value	3,825	2.8	1.0	0.07	0.70	3.13	0.67
2017	Value	4	3.6	0.4	0.01	1.32	2.68	0.45
2018	Value	4	3.9	0.1	0.0	1.86	2.14	0.29
2019	Value	4	4.0	0.0	0.0	2.29	1.71	0.18
2020	Value	4	4.0	0.01	0.0	2.63	1.37	0.12
			<b>4.0</b>		0.18	2.9		0.45
				<b>precision</b>	<b>0.82</b>		precision	0.55

Source: calculated by the author

According to the calculations in the table. 2.14, JSC "First Ukrainian International Bank", as well as previously investigated systemically important banks



Continuation of table 2.15

Year	Coefficient	Value	Forecast	Error	Mean square deviation	Forecast	Error	Mean square deviation
2015	Value	2.83	0.00	2.8	1.0	0.0	2.83	1.0
2016	Value	2.83	2.26	0.6	0.04	0.57	2.26	0.64
2017	Value	3,385	2.72	0.7	0.039	1.02	2.37	0.49
2018	Value	3,385	3.25	0.1	0.002	1.49	1.89	0.31
2019	Value	3,385	3.36	0.0	0.0	1.87	1.51	0.2
2020	Value	3.21	3.38	0.12	0.003	2.17	1.04	0.104
			<b>3.24</b>		0.181	2.38		0.458
				<b>precision</b>	<b>0.819</b>		precision	0.542

Source: calculated by the author

Therefore, according to the received results of the forecast of the level of economic security of strategically important banks and JSC "Poltava Bank", all these institutions ensure their economic security at a high level, thanks to their effective business model of development and control.

A different situation can be traced in JSC "KB "Land Capital". During the studied periods, a negative trend towards a decrease in the level of economic security can be traced at the specified bank, which was also confirmed by the forecast. According to the calculations of the forecast for exponential smoothing, presented in the table. 2.16, the level of economic security of JSC "KB "Land Capital" will have a coefficient value of 1.47, which determines a low level of security. This is evidence that the bank needs to review its goals, tasks and prospective development model, as it may not be able to fulfill its obligations in the near future.

Table 2.16

## Projected level of economic security JSC "KB "Land Capital"

		Exponential model 1				Exponential model 2		
		$\alpha=$		precision	<b>0.781</b>	$\alpha=$	precision	<b>0.357</b>
			<b>0.8</b>			<b>0.2</b>		
Year	Coefficient	Value	Forecast	Error	Mean square deviation	Forecast	Error	Mean square deviation
2016	Value	1,825	0.0	1.8	1.0	0.0	1.83	1.0
2017	Value	1,825	1.46	0.4	0.04	0.37	1.46	0.64
2018	Value	1.86	1.75	0.1	0.003	0.66	1.20	0.418
2019	Value	2,035	1.84	0.2	0.01	0.9	1.14	0.312
2020	Value	1,585	2.00	0.1	0.067	1.13	0.46	0.084
			<b>1.47</b>		0.194	1.02		0.491
				<b>precision</b>	<b>0.806</b>		precision	0.509

Source: calculated by the author

To confirm the relevance of the forecast based on the exponential smoothing model, we will conduct a comparative forecast of the level of economic security of banks based on the adaptive Brown model.

The advantage of using Brown's adaptive forecasting model is to take into account the inequality of time series data - the priority of recent implementations. The model allows you to take into account changes in trends, as well as any fluctuations in which a pattern can be traced. Thus, an adequate system of short-term forecasting, theoretically justified and practically significant, has been developed.

This model is characterized by a high level of accuracy, if the error is less than 10%, a good level of accuracy - the range from 10% to 20%, satisfactory - 20-50%, and unsatisfactory accuracy - more than 50%.

Brown's model has the following form:

$$Y_{(t+k)} = A_0 + A_1 k \quad (2.3)$$

$A_0$  is the value of the last level;

$A_1$  – growth determination coefficient;  $k$

– the number of predictive steps;

$t$  is the time series of the forecast.

$A_0$  coefficient is a natural component close to the last level; coefficient  $A_1$  - growth that was formed at the end of the observation period, shows the growth rate in the early stages [142].

Brown's adaptive model is built according to the stages:

Stage 1. The initial values of  $A_0$  and

$A_1$ , by the method of least squares for linear approximation:

$$Y_r(t) = A_0 + A_1 t \quad (2.4)$$

Stage 2. Using the parameters  $A_0$  and  $A_1$ , a forecast is formed for one step ( $k = 1$ ) according to the Brownian model:

$$Y_r(t,k) = A_0(t) + A_1(t)k \quad (2.5)$$

Stage 3. The estimated value of the economic indicator  $Y_p(t,k)$  is compared with the actual  $Y(t)$  and the error of their discrepancy (error) is calculated. When  $k = 1$ , we get:

$$e(t+1) = Y(t+1) - Y_p(t,1) \quad (2.6)$$

Stage 4. According to (2.6) with given values are adjusted parameters models

The modification of the Brown model has the following form:

$$A_0(t) = A_0(t-1) + A_1(t-1) + (1 - \beta)2e(t) \quad (2.7)$$

$$A_1(t) = A_1(t-1) + (1 - \beta)2e(t) \quad (2.8)$$

where  $\beta$  is the data discount factor, variable in the plane from 0 to 1; shows a decrease in the significance of the data per unit of time, reflects the degree of confidence in late observations. The optimal value of  $\beta$  is calculated by the formula:

$$\beta = (N - 3)/(N - 1) \quad (2.9)$$

where  $N$  is the length of the time series.

$e(t)$  is the error of forecasting the level of  $Y(t)$  at the moment of time  $(t-1)$  one step ahead.

Stage 5. Based on the model with adjusted data  $A_0$  and  $A_1$ , a forecast for the next period of time is formed.

Stage 6. A forecast is built.

So, according to the stages of building the Brown model, we will make a forecast for JSC "Ukreximbank". As the initial data, as in the previous model of exponential smoothing, the coefficient determination of the level of economic security of the corresponding bank will be taken, and the specified levels in the model correspond to the corresponding years, i.e. 2015 corresponds to level 1, 2016 to 2 level, 2017 – 3rd level, 2018 – 4th level, 2019 – 5th level, 2020 – 6th level.

According to the results obtained according to Brown's model, JSC "Ukreximbank" will maintain the positive dynamics of the level of its economic security at a very high level and, in the future, will increase the value from 3.545 in 2020 to 4.0 (table 2.17) in the forecasted year of 2021. The error of the model for the studied bank is 2% (table C.1, appendix C), which characterizes it as a model with a high level of accuracy.

Table 2.17

Calculation of Brown's adaptive model for JSC "Ukreximbank"

levels	weeken ddata, Yt	A0	A1	Predictedvalue, Yp	Prediction error, e	(Yt-Yp)^2
1	2.66	2.80	0.16	2.95	-0.29	0.09
2	3.21	2.93	0.13	3.18	0.03	0.00
3	3,545	3.06	0.13	3.45	0.09	0.01
4	3,545	3.20	0.14	3.76	-0.21	0.04
5	3,545	3.32	0.12	3.92	-0.38	0.14
6	3,545	3.40	0.09	3.92	-0.38	0.14
7				<b>4.0</b>		0.43

Source: calculated by the author

According to the received results of forecasting the level of economic security of JSC "Raiffeisen Bank Aval" according to the Brown model, the bank will have a very high level of security in the next period, which is confirmed by the obtained forecast value of the coefficient - 4 (Table 2.18). The error of the model for the studied bank is 1% (table C.2, appendix C), which characterizes it as a model with a high level of accuracy.

Table 2.18

## Calculation of Brown's adaptive model for Raiffeisen Bank Aval JSC

levels	weekend data, Yt	A0	A1	Predicted value, Yp	Error forecast, e	(Yt-Yp) <sup>2</sup>
1	3.49	3.58	0.09	3.67	-0.18	0.03
2	3.825	3.65	0.07	3.79	0.03	0.00
3	4	3.73	0.07	3.95	0.05	0.00
4	4	3.80	0.08	3.99	-0.12	0.01
5	4	3.87	0.07	4.00	-0.21	0.05
6	4	3.92	0.05	4.00	-0.22	0.05
7				<b>4.00</b>		<b>0.14</b>

Source: calculated by the author

The predicted level of economic security of JSC "First Ukrainian International Bank" was studied. According to the calculations (table 2.19.), FUIB will provide a very high level of its economic security at the level of 3.98 in the forecast period. The error of the model for the studied bank is 1%, which is shown in the table. C3 (Appendix C), which characterizes it as a model with a high level of accuracy.

Table 2.19

## Calculation of Brown's adaptive model for First Ukrainian JSC international bank"

levels	weekend data, Yt	A0	A1	Predicted value, Yp	Error forecast, e	(Yt-Yp) <sup>2</sup>
1	3.65	3.51	0.09	3.60	0.05	0.00
2	3.65	3.60	0.09	3.79	-0.14	0.02
3	3.65	3.69	0.08	3.93	-0.28	0.08
4	4	3.74	0.06	3.87	0.03	0.00
5	4	3.80	0.06	3.91	-0.10	0.01
6	4	3.85	0.05	3.95	-0.15	0.02
7				<b>3.98</b>		0.13

Source: calculated by the author

A positive trend to ensure economic security and the possibility of increasing its level to 3.69 in the forecast period, according to the calculations in the table. 2.20, traceable to Poltava Bank JSC. Model error for the subject

of the bank is 2%, which is shown in the table. P.4 (Appendix C), which characterizes it as a model with a high level of accuracy.

Table 2.20

## Calculation of Brown's adaptive model for Poltava Bank JSC

levels	weeken ddata, Yt	A0	A1	Predictedvalue, Yp	Prediction error, e	(Yt-Yp)^2
1	2.83	2.81	0.10	2.92	-0.09	0.01
2	2.83	2.91	0.09	3.10	-0.27	0.07
3	3,385	2.98	0.07	3.19	0.20	0.04
4	3,385	3.07	0.09	3.42	-0.03	0.00
5	3,385	3.15	0.08	3.58	-0.19	0.04
6	3.21	3.22	0.07	3.63	-0.42	0.17
7				<b>3.69</b>		0.33

Source: calculated by the author

According to calculations based on Brown's model, presented in table. 2.21, JSC "KB "Land Capital" will have a low level of economic security in the next period and will be - 1.44. The error of the model is 3%, which is given in the table. P.5 (Appendix C), which characterizes its level of accuracy as good. Accordingly, there is a high probability that the level of economic security of JSC "KB "Land capital" in the forecasted year of 2021 will have a low level.

Table 2.21

## Calculation of Brown's adaptive model for JSC "KB "Land Capital"

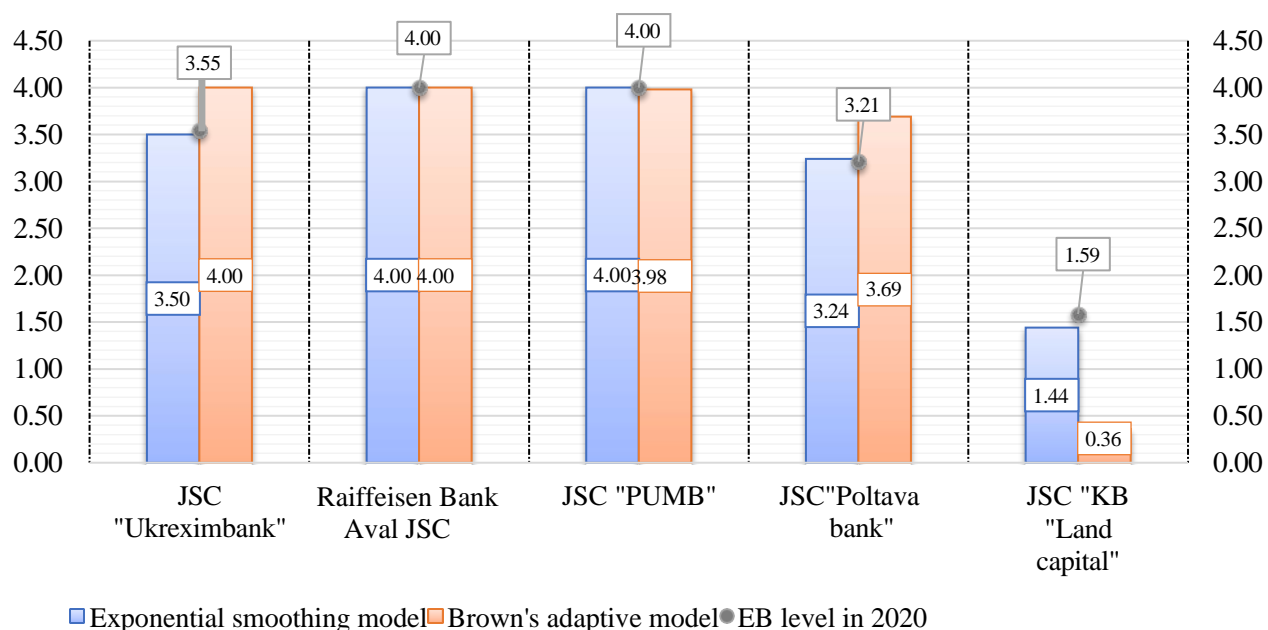
levels	weeken ddata, Yt	A0	A1	Predictedvalue, Yp	Prediction error, e	(Yt-Yp)^2
1	1,825	2.43	-0.12	2.19	-0.37	0.13
2	1,825	2.28	-0.15	1.82	0.00	0.00
3	1.86	2.13	-0.15	1.52	0.34	0.12
4	2,035	2.00	-0.12	1.40	0.64	0.40
5	1,585	1.94	-0.06	1.56	0.03	0.00
6				<b>1.44</b>		0.85

Source: calculated by the author

According to the conducted forecasting of the assessment of the level of economic security of the subjects banks was used model exponential

smoothing and adaptive Brownian model. The obtained results confirm the trend that developed during the analysis of the level of economic security of banks in the period from 2015 to 2020.

To compare how much the predicted values differ from the obtained level of economic security of banks in 2020, we will present their graphical interpretation in Fig. 2.16.



Rice. 2.16. Forecast values of the level of economic security of banks and the level of their economic security in 2020

Source: constructed by the author.

Summarizing the obtained analytical data, we can say that the proposed method of analyzing the economic security of financial and credit institutions is relevant and expedient to use. After all, if we were to equate the financial component of EBFCU with the economic security of the institution as a whole, the analysis would be incomplete. Yes, according to the data presented in the table. 2.9, it can be argued that the actual level of economic security was obtained thanks to the additional analysis of informational, marketing and personnel components of economic security.

JSC "CB "Land Capital" became the confirmation of this. If only the financial component is analyzed when assessing the level of the EBFCU, then it is indicated

the bank could very well get a high level of economic security. Most of the indicators characterizing the financial component were fulfilled by the bank. But, with a comprehensive assessment of all four components proposed by the methodology, it turns out that JSC KB "Land Capital" has an average level of economic security and a negative downward trend. According to the forecast values obtained (Table 2.16), the level of economic security of the same bank in 2021 will be low.

Also, a confirming factor of the relevance of the proposed methodology is the decision of the NBU Board of Directors adopted on July 1, 2021 regarding the classification of JSC "KB

"Land capital" in 2021 to the category of insolvent. According to the methodology, the received forecast data showed a decrease in the level of the bank's economic security to a low level in 2021.

Summarizing the obtained results, the adequacy and relevance of the proposed methodology for assessing the level of economic security of the PKU in combination with forecasting based on the exponential smoothing model and the adaptive Brown model have been proven.

### SECTION 3

## WAYS TO INCREASE THE LEVEL OF ECONOMIC SECURITY OF FINANCIAL AND CREDIT INSTITUTIONS IN UKRAINE

### **3.1. Conceptual model mechanism software economic security of financial and credit institutions**

The economic security of financial and credit institutions is the basis of national security, since the circulation of funds in the financial sector plays a major role in the development of the national economy. Complex means and methods of protecting economic interests and ensuring the economic security of financial services market subjects, especially financial and credit institutions, define the overall concept of the country's economic security.

In modern economic conditions, the issue of forming an effective mechanism for ensuring the economic security of financial and credit institutions through increasing the competitiveness of financial services market entities is an urgent issue. Not only the competition in the market of financial services is intensifying, but also the control over their activities by the regulator - the National Bank of Ukraine. Thus, the closure of financial and credit institutions is observed, which requires the creation of an effective mechanism for ensuring the economic security of the PKU.

The functioning mechanism of any system acts as the basis of its stability. The creation of an effective mechanism for ensuring the economic security of the PKU in the conditions of the global pandemic of COVID-19, the economic crisis and challenges and threats in the activities of financial and credit institutions is one of the tasks of the national economy at the micro level and the financial system, in particular

The category "mechanism" is used in economic, economic, organizational, organizational-economic and organizational-management contexts. The peculiarity of the mechanism is that the dualism "process-

structure". That is, we can talk about the mechanism both in terms of the process and the set of elements.

Thus, the philosopher, sociologist, political scientist and economist Karl Marx [143, p. 11] approached the disclosure of the concept of "mechanism" through the connection with the "capitalist mode of production." According to his position, the mechanism represents the interaction of the system of social development and economic organization.

In the Great explanatory dictionary of the modern Ukrainian language [144, p. 665], the mechanism is interpreted as a device that transmits or transforms motion; sequence of actions of individual elements, means; a set of states and processes that form a certain phenomenon (chemical, physical, etc.).

In technology, the concept of "mechanism" is explained as a set of artificial, motion-connected links that perform specified movements, but with the condition that each defined position of one link corresponds to a certain position of other links [145, p. 98].

According to the economic dictionary [146, p. 80], "economic mechanism" is a constituent element of the economic mechanism, which includes economic levers and incentives. The definition of the term "mechanism" according to the opinion of O.O. Maievska. [147, p. 148] means a system of interrelated measures and factors aimed at increasing the efficiency of work, meeting the needs of the population, ensuring the constant growth of money flows to the state and municipal budgets, etc.

Yes, Ilyashenko O.V. in his research work, he proposes to understand the economic mechanism as a set of interdependent methods and levers of planned influence on the activity of the enterprise, exchange, distribution and consumption of products. [148, p. 165].

Doronina M.S. characterizes the concept of "mechanism" as a complex system with input and output, which has its own characteristic components [149, p. 28]. It focuses attention on the fact that the developer of the mechanism must determine the selection of such elements that will ultimately give the desired parameter values with minimal energy loss.

Kvasnytska R.S. and Jereleyko S.O. characterize the mechanism as a system that determines the sequence of implementation of certain processes or the order of performance of relevant works [150, p. 55].

According to A. M. Bukreev's research [151], a mechanism is a system of an organization, a carrier and implementer of an organization, its process. Organization is the function of the mechanism and the result of its action. The description of the mechanism covers its organization and operation.

Thus, the economic mechanism should be understood as a multi-level system of forms and methods of influence on the economic, financial and other types of activity of subjects aimed at achieving a high level of economic security by the institution.

The interpretation of the concept of "mechanism of provision" in economics has a more precise direction and purpose. Yes, according to Averichev I.M. [152, p. 185] the mechanism for ensuring the economic security of enterprises is an integrated set of elements of an institutional and operational nature. According to the scientist's approach, the elements affect the effectiveness of the economic activity of the subject due to the creation of safe conditions of activity.

Poidak-Nosyk N.N. [153, p. 342] approaches the definition of the mechanism of ensuring the economic security of enterprises through the creation of conditions for the protection of the enterprise from danger.

In turn, Vasylytsiv T.G. [154, p. 25-26] proposes to understand the mechanism of ensuring economic security as a mandatory component of the security system, which is based on the tasks and principles of security, provides a system of a set of methods, tools and specific measures for the implementation of the policy of guaranteeing security.

Based on the above considerations, we propose to understand the mechanism of ensuring the economic security of financial and credit institutions as a system of related methods of influence and levers of control over the activities of the PKU to ensure high performance results and protect the interests of the institution from threats from the external and internal environment.

The formation of a conceptual model of the mechanism for ensuring the economic security of the FCU involves taking into account all conditions and aspects of the activity of financial and credit institutions, as well as clearly defined elements and a scheme of their interaction. In our opinion, the structure of the mechanism for ensuring the economic security of the PKU consists of blocks, the simultaneous interaction of which is designed to ensure a sufficient level of economic security, which is obtained as a result of observing the interests of the institution. This refers to the subject's interaction with the external and internal environment.

The result of the operation of such a mechanism is the provision of a high level of economic security of the FCU in accordance with its interests, counteraction to internal and external threats, preservation of profitability and innovative development. The choice of key elements in the process of ensuring the economic security of the PKU allows for the formation of a complex mechanism that will be aimed specifically at achieving the goal.

The importance of the issue of creating a conceptual model of the mechanism for ensuring the economic security of financial and credit institutions in the theoretical and methodological aspect is determined by the fact that its solution allows to protect the institution from threats and create the necessary conditions for development.

Regarding the concept of "concept", according to the Encyclopedia of Modern Ukraine [146, p. 148], "a concept (from the English *conceptio*) is a system of views, concepts about certain phenomena or processes, a way of understanding and interpreting them; the main idea of any theory, the main idea; an idea or plan of a new, original understanding; the constructive principle of artistic, technical and other types of activity".

Accordingly, we suggest that the conceptual model of the mechanism for ensuring the economic security of financial and credit institutions should be understood as a scientifically based system of interconnected views, basic principles, directions, conditions and order that create a universal approach to solving the task of ensuring the stability of a financial and credit institution and protecting its interests from manifestations of external and internal threats. The ultimate goal

the creation of such a conceptual model is the formation of an effective and efficient mechanism for ensuring the economic security of the PKU, which takes into account the main goals of its activity.

The conceptual model of the mechanism for ensuring the economic security of financial and credit institutions (EBFCU) has its own logic of construction, is complex in nature and adapts in accordance with market requirements, threats and trends.

The main elements of the conceptual model of the mechanism for ensuring the economic security of the FCU are: the Strategy for the Development of the Financial Sector of Ukraine, the goals and objectives of ensuring the economic security of the FCU, the principles of ensuring the EBFCU, indicators of the economic security of the FCU, a set of measures to ensure the EBFCU. All elements have a close cause-and-effect relationship.

So, according to the logic of construction and main elements, the conceptual model of the EBFCU provision mechanism combines goals, tasks, principles, stages, factors of internal and external influence, describes the organizational structure of interaction for the successful achievement of the set goal.

The purpose of the conceptual model of the EBFCU provision mechanism is to determine the key aspects in the issue of ensuring the economic security of a financial and credit institution by assessing its level. In the future, this will allow to develop/adjust the development strategy of the institution.

The main tasks of the mechanism, in accordance with the purpose, should include:

- objective and comprehensive analysis of the activity of a financial and credit institution;
- determination of deviations from normative values and dynamics of changes;
- identification of key factors that had a significant impact on the performance of the institution;
- establishment of causal relationships between the analyzed indicators;

- formation of an effective set of measures to eliminate negative effects on the stability of the institution;
- forecasting the future level of economic security.

In a narrow sense, the mechanism for ensuring the EBFCU is a set of rules, measures and procedures for conducting a diagnostic study of the activity of the FCU to identify factors affecting the internal and external environment that affect the work of the institution, with the aim of providing recommendations on reducing negative impacts, ensuring stable work and development potential.

Control over the activities of financial and credit institutions is carried out by the National Bank of Ukraine. The NBU contributes to the dynamic development and competitiveness of FCUs, ensures the stability of work and improves the legal framework for their activities. This is especially true of credit unions and pawnshops that came under its supervision in 2020.

First of all, control by the regulator involves the creation of conditions for the development of banks and non-bank financial institutions, increasing the level of their reliability, transparency and solvency. Oversight of the activities of the FCU provides clients, depositors, creditors and borrowers with confidence that the institution works stably, is timely and fully able to fulfill its obligations.

The National Bank of Ukraine [155] provides for the main tasks in the regulation and supervision of the activities of banks, which include: protecting the interests of clients and depositors from fraud and inefficient management; ensuring a competitive and transparent banking environment; ensuring stable and efficient operation of banks; maintaining high standards and professionalism in the banking sector.

These tasks are undoubtedly relevant, but correspond to the activities of banking institutions only. Taking into account the fact that the NBU supervises also the activities of pawnshops and credit unions, taking into account new challenges, we propose that the main tasks of regulation and supervision of

the activities of financial and credit institutions, which are primarily directed to the control of the level of economic security of the FCU, include the following:

- protection of the rights of depositors and clients;
- saving personal data of customers, staff and management;
- compliance of the FCU management with qualification requirements and business reputation;
- successful performance of the main tasks in accordance with the business model of the development of the PKU;
- ensuring transparency and openness of information about the FCU, its activities and services provided;
- compliance by the FCU with the current requirements of the law;
- fulfillment of obligations of FKU to customers, investors and partners;
- ensuring anti-corruption activities;
- prevention of abuse of official duties and prevention of illegal activities of FKU personnel;
- reliability and legality of FCU advertising;
- compliance with the norms of behavior in the market of financial services;
- compliance with the rules of fair competition.

The National Bank of Ukraine supervises the activities of the FCU, in accordance with the tasks, in the form of inspections and on-site supervision. Comprehensive supervision is carried out taking into account the principles. The main principles of the organization of banking supervision identified by the NBU [155] are:

1. The system of supervision of banking institutions is multi-level;
2. Continuous improvement of regulatory and methodological support of supervisory aspects of work;
3. Improvement material and technical, scientific and personnel ensuring supervision of banking activities;
4. Increasing the level of qualification of banking supervision specialists on a permanent basis;

5. Strengthening the transparency and publicity of information regarding the financial condition of banks, constant use of mechanisms of market self-discipline;
6. Implementation of the experience of other countries before the introduction of international standards and practices of bank supervision.

Taking into account the transfer of pawnshops and credit unions under the control of the National Bank, the board of the NBU developed basic principles, which are summarized in the table. 3.1, according to which their activities are regulated.

Table 3.1

## Basic principles of supervising the activities of pawnshops and credit unions

Pawnshop	Credit union
<b>Proportionality</b>	
The intensity of supervision and regulatory requirements are determined according to the size, complexity of the business model and risk profile.	The requirements for credit unions and the intensity of supervision are determined by the size, significance, complexity of the business model structure, and the institution's personal risk level; the ability to fulfill the requirements in accordance with the socially oriented the nature of their activities.
<b>Promisingview</b>	
Analysis activity is carried out in accordance with the understanding of the business plan, prospects and potential risks.	Analysis activity is carried out going out from an understanding of the potential risks involved type of FKU.
<b>Early detection and early response</b>	
Assessment of potential risks and their detection is carried out in the early stages for timely further communication and taking appropriate measures.	The assessment of potential risks is carried out by analyzing the key risk indicators of activity, prospects for future communication, and use necessary influence measures.
<b>Professional judgment</b>	
The evaluation is based on reasonable conclusions, which were formed in accordance with knowledge and experience, taking into account a comprehensive and comprehensive analysis of the information base.	Motivated, purposeful and well-founded assessmentthe regulator of events, persons, circumstances, operations, transactions within the framework of the performance of supervisory functions, which is based on the knowledge and experience of the NBU. A comprehensive analysis of information documents, which were formed in as a result of regulation and supervision, taking into account information from open sources.
<b>Legal certainty</b>	
Implementation of clear and understandable requirements for compliance with the system of regulatory and legislative acts, including delivery schedules activities of the institution in accordance with the requirements.	The activities of credit institutions must comply with these regulationsrequirements and regulatory requirements.

Source: compiled by the author using [155]

Based on the above, the supervision of the activity of the FCU by the supervisory body occupies an important place in the integral mechanism of ensuring the EBFCU. It is necessary to pay due attention to the developed normative provisions of the National Bank of Ukraine in the matter of regulation and development of the concept of development of non-banking FCUs. In general, the implementation of control over the activities of the PKU by one regulatory body allows for a comprehensive approach to the assessment of the level of development of institutions and the analysis of factors that affect them.

At the same time, it is worth noting that each financial and credit institution regulates its own activities, which provides a block of internal control in the conceptual model of the EBFCU support mechanism. It is carried out in accordance with internal regulatory documents, acts, regulations and other types of regulatory documents. We believe that reports on the results of internal control of the financial and credit institution's performance should be freely available to external users. The availability of the specified report and its openness will be one of the factors that testify to the transparent and stable operation of the institution with a sufficient level of economic security.

The theoretical and methodological basis for the formation of the conceptual model of the mechanism for ensuring the economic security of the FCU is formed by the substantiation of the meaning of the concept of "economic security of a financial and credit institution", the definition of its role in ensuring stable and profitable activity, as well as the definition of the regulatory and legal basis that governs financial and credit institutions in their activities.

The conceptual model of the mechanism for ensuring the economic security of financial and credit institutions, according to its main purpose, should ensure:

- carrying out information and analytical work with the aim of selecting a set of data, useful and necessary for the analysis of the work of the PKU;
- monitoring the situation in the external and internal environment of the PKU to identify existing or possible threats;
- analysis of qualitative and quantitative characteristics that show the effectiveness of the institution's work;

- assessment of the level of economic security of the FCU using the appropriate methodology;
- formation of a set of measures to increase the level of economic security of the PKU and development of a long-term plan for the development of the institution, taking into account the results of the analysis.

The effectiveness of the EBFCU provision mechanism depends on the volume, timeliness and quality of information that characterizes the external and internal environment, the results of the activities of the FCU. When conducting an analysis of the institution's activity, a large information base is developed, the sources of which are financial reporting data; normative, statistical and expert information; statistical data of the regulator; information from official sources and mass media/social networks.

Ensuring the economic security of the FCU is based on certain principles that must be taken into account in the conceptual model of the EBFCU provision mechanism. V. V. Sukhonos in the issue of ensuring the economic security of financial and credit institutions singles out the principles of: continuity, optimality, planning, coordination, competence, transparency, confidentiality and responsibility [156, p.65].

Zachosova N.V. [157, p. 220-221] proposes to be guided by the principles of legality, economic expediency (rationality) in ensuring the economic security of financial and credit institutions; complexity; independence; systematicity; competence; consistency; timeliness; counterintuitiveness; emergencies; continuity; mutual benefit of the interests of the institution and clients; the dominance of threat prevention over the elimination of their consequences.

Khutorna M.E. [158, p. 84-87] divides the principles of ensuring the economic security of financial and credit institutions into two categories - specific and general. From the point of view of a scientist, general principles include the principles of scientific validity, complexity, continuity, and efficiency. As for the specific category of principles, it includes the principles of proactivity, prudence, adaptability, rational profitability, social

responsibility, economic responsibility, current and prospective safety margin adequacy.

Sharing an opinion on the expediency of dividing the principles into groups, Kovalenko V.V. and Radova N.V. under general principles, it is proposed to consider the principles of adaptability and mobility, strategicness and purposefulness, hierarchy, rationality and economic effect, complexity and mutual consistency of management, competitiveness, participation and social orientation, innovation and development. The principles of due diligence, balanced profitability, redundancy, economic and social responsibility belong to the category of specific [159, p. 342-326].

To the specific principles of ensuring the stability of the banking system Kuznetsova A.Ya. and Pogorelenko N.P. offer to attribute, such as purposefulness, openness, hierarchical consistency, integrity of regulation, stimulation, balance of interests, responsibility, legality [160, p. 12].

The scientists carried out a thorough analysis of the issue of determining the main principles in ensuring the economic security of financial and credit institutions, mostly banks. All of the above principles are objective and well-founded, but some of them combine others in their essence, based on the tasks they face. Therefore, after summarizing the views of the above-mentioned scientists, we propose to define the following principles of ensuring the economic security of the PKU, which are listed in the table. 3.2.

From our point of view, the selected principles fully highlight the main aspects in achieving the set goal - countering threats, preserving the institution's potential for development and ensuring a high level of economic security of the PKU. It is the non-observance of these principles that leads to "failures" in the coordinated operation of the system.

The effectiveness and efficiency of ensuring the economic security of the FCU depends on the level of organization of information and analytical support. At

in the study of the analysis of the level of economic security of the PKU, verified, reliable information is used, which contains all the necessary statistical and analytical data. When conducting data diagnostics, specialists are faced with a large array of information that must be processed and distributed according to importance. The sources of information for the analysis are the financial statements of the financial and credit institution, statistical and regulatory data, expert data, information from official sources and mass media/social networks.

Table 3.2

### Basic principles of ensuring economic security, financial credit institutions

Principle	Content of the principle
Legality	Ensuring the economic security of a financial and credit institution complies with the current legislation of Ukraine and does not contradict the requirements local authorities, statutes and internal regulatory documents.
Independence	Measures to ensure the economic security of the financial and credit institution are carried out autonomously, without hindering the activity institutions
Timeliness	The obtained results of the analysis of the external and internal environment of the institution are relevant for their timely and operational analysis.
Rationality	Measures to ensure economic security should not lead to a deterioration of the conditions of activity and the level of economic security of financial credit institution. The costs of their implementation must be financially justified.
Dominance	The primary goal in ensuring economic security is financial of a credit institution should be to identify threats, and not to eliminate the consequences of their influence.
Information security	Use of data to analyze and monitor official results activities of the institution, information data from external sources are checked for reliability and only then taken into account in the work.
Continuity	Monitoring of the detection of possible threats to economic security is carried out constantly, in parallel with the main activities of the financial and credit institutions
Adaptability	The ability to take into account changes in the environment and adapt to them to increase competitiveness and efficiency

Source: compiled by the author based on [21; 30; 34; 41; 156–163]

The complexity of the analysis of the level of economic security of the PKU requires the use in the work of a large number of indicators of a qualitative and quantitative nature, which are capable of fully revealing the essence of economic security. Full-value analysis of the economic security of a financial and credit institution

is carried out according to its components: financial, informational, personnel, marketing, compliance, technical and technological, energy and material and power.

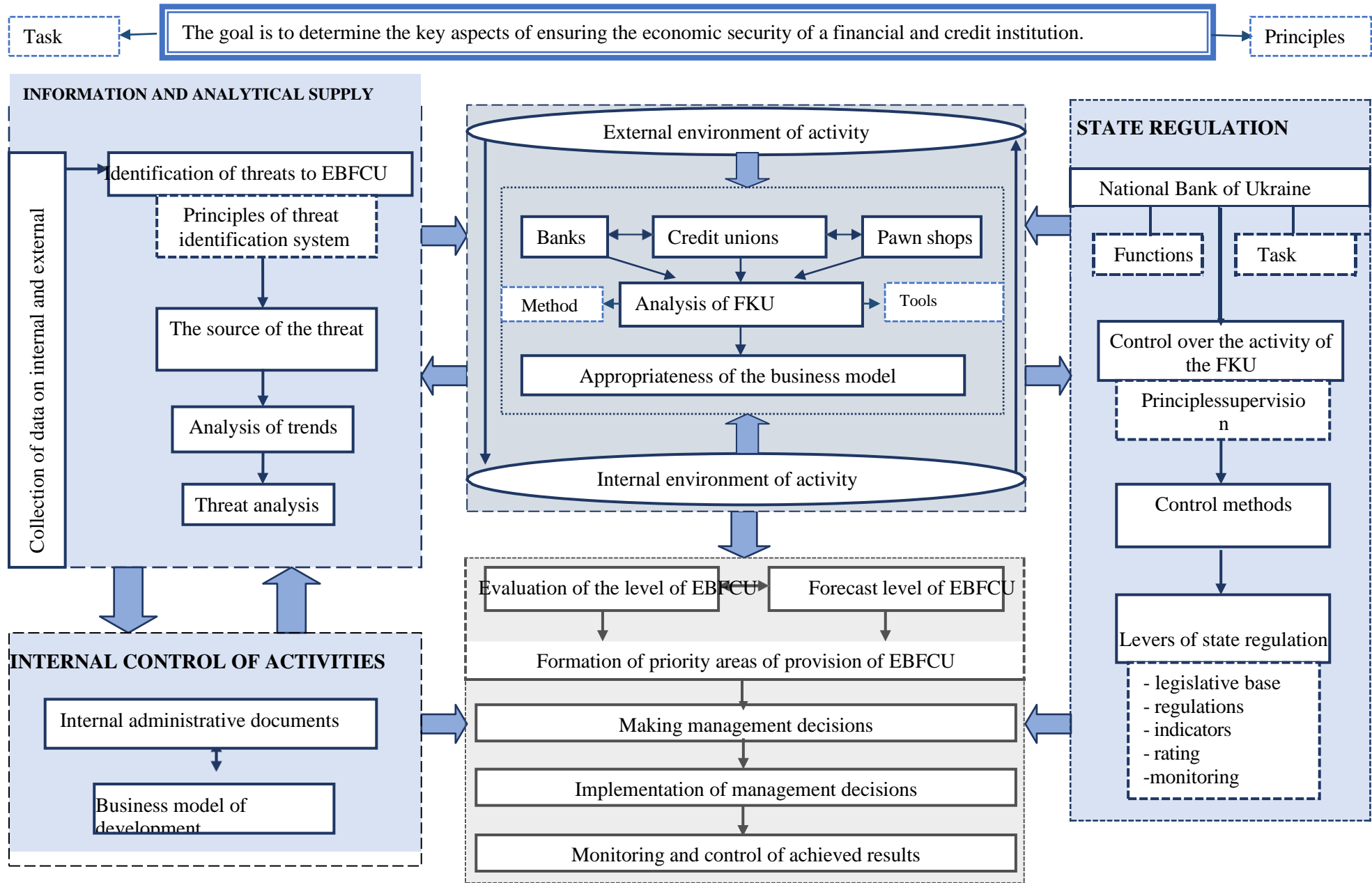
The key component of the EBFCU provision mechanism is the method of assessing the level of economic security of financial and credit institutions, which is given in subsection 2.2.

A clear definition of the main components of the mechanism for ensuring the economic security of the FCU, its main tasks, methods, principles and actions allows to coordinate this process and ensure its clear and prompt execution.

Accordingly, after considering the logical and structural elements in the mechanism of ensuring the economic security of the FCU, we offer the following conceptual model (Fig. 3.1). The conceptual model of the mechanism for ensuring the economic security of the PKU has a synthetic nature and consists of interconnected functional subsystems, as already noted. Thus, the proposed mechanism is presented in a composite form and consists of specific elements and components that are interconnected and interact with each other.

The proposed conceptual model of the mechanism for ensuring the EBFCU combines the goal and task of ensuring economic security, which reflect the object and subject of the study, with the principles that are the basis for ensuring the achievement of the goal, determines the content of the stages of the research methodology at the EBFCU level based on the use of the information base formed during conducting an informational and analytical study that ensures the validity of management decisions regarding the provision of a high level of EBFCU.

The scientific principles of the formation of a conceptual model of the mechanism for ensuring the economic security of financial and credit institutions take into account the interests of financial and credit institutions, the specifics of their activities, functions, management principles and methods, organizational structure, tools, assessment criteria, levers and threat analysis tools. The obtained results make it possible to develop directions for the clear management of the activity of the FCU in Ukraine.



Rice. 3.1. Conceptual model of the mechanism for ensuring the economic security of financial and credit institutions  
 Source: author's own development

The effectiveness of the EBFCU support mechanism depends on synchronicity, adherence to system and comprehensiveness in the interaction of all elements of the mechanism, taking into account the principles, application of tools and methods of activity of financial and credit institutions.

The EBFCU support mechanism is necessary, first of all, for the implementation of financial policy, the priorities of which are the functioning of financial and credit institutions (FCUs), while achieving a significant economic effect, which is manifested in the growth of investment resources in the country's economy. Secondly, without knowing the mechanism of the implemented policy, the conditions of its implementation, the relations between the participants, it is impossible to correctly determine or evaluate the results and costs, which is the main thing in determining the effectiveness of the activity. And, thirdly, an effective mechanism contributes to increasing the economic security and financial stability of financial and credit institutions and makes it possible to take preventive measures to prevent threats of endogenous and exogenous origin. The interdependence of the development of the functional subsystems of the EBFCU support mechanism makes it possible to strengthen the adaptive capabilities of the financial and credit institution and counteract competitive pressure.

The effectiveness of the application of the conceptual model is based on the possibility of its use both in stable and in crisis conditions. Also, it is worth noting the fact of increasing threats to the safe operation of the PKU from fraudulent actions, which have especially intensified during the pandemic. Moreover, illegal actions target all components of economic security, not just financial security. In order to strengthen protection against fraudulent encroachments on financial, informational, intellectual, personnel and other resources, which respectively take place in each component of the EBFCU, it is proposed to create a single database in order to counter threats. Access to this database will be open to employees of the financial and credit institution.

The database will contain data not only on fraud in a specific institution. It will combine data on identified threats of other financial and credit institutions that are publicly available, as this is information

confidential Also, data on the occurrence of crisis situations in other subjects of the financial services market and enterprises will be noted. In our opinion, such an information base will allow us to characterize the objectives of the threats, whether they were created synthetically by criminal groups, other market subjects or arose as a result of changes in the business environment; determine the connection between these threats and whether the threat that arose in the environment of non-financial and credit institutions can have an impact on them.

The economic security of financial and credit institutions is ensured by defining the main strategic goals of the institution's development and preserving its stable financial condition, developing a strategic plan for development and ensuring economic security, building an adequate and effective mechanism for identifying threats and minimizing or preventing their impact on the institution. A conceptual model of the EBFCU support mechanism was created precisely for a comprehensive assessment and understanding of the essence of economic security.

The introduction of an appropriate mechanism for providing EBFCU will allow to develop effective and timely measures to increase the economic security of financial and credit institutions, to meet the needs of economic entities in the necessary capital, to improve the economic condition of depositors and creditors, and in particular, to ensure the stable functioning of the financial services market.

## CONCLUSIONS

The conducted research made it possible to substantiate the theoretical provisions and develop methodological and practical recommendations for ensuring the economic security of financial and credit institutions and scientific and practical recommendations for identifying and countering threats. The obtained theoretical-methodical and applied results provide grounds for such conclusions.

1. Theoretical generalization of the basic elements of the concept "economic security of financial and credit institutions" made it possible to single out its basic components, to determine properties, processes, capabilities that complement each other. The proposed definition clarification of the concept of "economic security of financial and credit institutions" as a prerequisite for development, which ensures stable activity, protection of economic interests, resources, legal rights, and the ability to resist external and internal threats. The specified position allows to expand the theoretical and methodological basis of ensuring the economic security of financial and credit institutions from the standpoint of the effectiveness of the strategy of sustainable development.

2. The scientific approaches to the identification of risks and threats by each component are deepened, the most significant signs of threats to the economic security of financial and credit institutions are systematized and given, which are recommended for use in the process of their identification, which outlines directions for their prevention and/or minimization. The components of economic security of financial and credit institutions specified by the author include: financial, marketing, personnel, informational, energy, technical and technological, compliance and material-force. The system characteristics of ensuring the economic security of financial and credit institutions are considered as a complex of interrelated organizational, financial, and legal measures that ensure stability, adaptability, protection of economic interests and development of financial and credit institutions in the face of negative changes in the external environment.

3. Scientific approaches to substantiating the content and importance of information and analytical provision of economic security of financial and credit institutions have been improved. Information and analytical support

economic security of financial and credit institutions is characterized as difficult to formalize, which consists in the collection, processing, analysis, interpretation of information and is necessary when making management decisions to ensure the economic security of financial and credit institutions. The classification of information for the purposes of ensuring the economic security of financial and credit institutions is presented, the main tasks of information and analytical support and the sequence of stages of its implementation are defined. The presented scientific provisions will contribute to the improvement of the quality level of processing the necessary information arrays with maximum effectiveness with minimum time consumption.

4. A methodical approach to assessing the level of economic security of financial and credit institutions is proposed. The author's approach is based on a scoring method using the Harrington scale to determine the level of economic security, according to which economic security corresponds to one of five levels. Also, this approach, in contrast to others, uses an exponential smoothing model and an adaptive Brownian forecasting model. The application of forecasting in the methodology of assessing the level of economic security allows to assess its current state and, at the same time, to make forecasts for the next period and immediately determine the directions of development of the financial and credit institution and subsequently form a set of measures to eliminate problematic aspects of the activity.

5. The scientific approach to the formation of the main areas of ensuring the economic security of financial and credit institutions based on the results of the analysis of the main performance indicators has been improved. The specified approach to solving the issue of ensuring the economic security of financial and credit institutions makes it possible to determine the priority of the assigned tasks when forming a development strategy. The approbation of the proposed methodology was confirmed by the obtained results, as one of the studied banks received a low level of economic security, according to the forecast for 2021, which was confirmed by its further transfer to the category of insolvent.

6. A conceptual model of the mechanism for ensuring the economic security of financial and credit institutions has been developed, which fundamentally

differs from existing multifaceted ones. The presented model of the mechanism takes into account the interests of the financial and credit institution, functions, management principles and methods, organizational structure, assessment tools and criteria. The author's concept of the mechanism for ensuring the economic security of financial and credit institutions allows the development of effective measures to increase the level of economic security of financial and credit institutions. It is suggested that the mechanism for ensuring the economic security of financial and credit institutions should be understood as a set of interconnected processes, methods, techniques and elements that interact in a certain order and ensure the successful achievement of the set goal - safe activity and potential for development.

7. The scientific approach to determining the strategy of ensuring the economic security of financial and credit institutions has been improved, which characterizes it as a concept of safe activity of a financial and credit institution. This approach makes it possible to introduce into the economic security strategy of financial and credit institutions an operational threat response system, which consists of vital elements, quickly detects threats and reacts to them; and a complex response system, which, compared to an operational one, has an expanded form and contains elements for a detailed, long-term analysis of the situation with the determination of trends in the development of financial and credit institutions. With the complex application of the proposed systems, the efficiency of the functioning of financial and credit institutions increases and economic security is ensured at a high level.

8. The study of the international experience of countering threats caused by the COVID-19 pandemic, which caused a decrease in the level of economic security of financial and credit institutions, made it possible to identify threats and propose a set of adjusted actions and measures, which will be relevant for implementation in the policy of countering the pandemic in Ukraine. It is recommended to use software of international standards

"RiskWatch" and "Risk Advisor", which will allow analytical monitoring of risks and threats in the activities of financial and credit institutions and timely implementation of preventive protection tools.

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