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MITIGATING BANKING RISKS BY STREAMLINING THE INTERNAL CONTROL SYSTEM

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CONCEPTUAL GUIDELINES OF THE RESEARCH

Actuality and importance of the research topic. Mitigating banking risks is a professional and academic issue, particularly considering the numerous financial scandals and economic crises around the world. Unfortunately, existing internal control systems have failed to identify and prevent the full range of problems in risk management, a fact most clearly demonstrated by the banking crisis in the Republic of Moldova during 2014–2015, which was triggered by banking fraud. Thus, for the banking sector of the Republic of Moldova, the primary motivation for analyzing the internal control system and identifying its implications for risk management is precisely this banking crisis, which demonstrated that risks materialize when banks have a control system that is functional only on the surface.

Growing uncertainties and emerging risks have put pressure on banking institutions, forcing them to adopt appropriate internal measures to mitigate them. In today's environment, internal controls are considered an essential tool for risk management and fraud prevention in the banking sector.

Banks in the Republic of Moldova can mitigate risks by implementing modern practices and procedures for organizing internal control, drawing on the experience of foreign banks. In addition to the requirements of the National Bank of Moldova (NBM), the risk management system in banks is also based on the existence of an internal regulatory framework, the recommendations of audit firms, and the recommendations of the Basel Committee on Banking Supervision (BCBS) of the Bank for International Settlements (BIS). Of particular importance in this regard is the Strategy for the Implementation of the Basel III Standards in the Banking Sector of the Republic of Moldova, which was agreed upon internationally and implemented nationally in accordance with the European legislative framework, with the aim of modernizing Moldova's banking legislation in line with the European framework and best practices.

At the same time, there are gaps in the scientific literature regarding the assessment of the effectiveness of internal control within the Moldovan banking system, and the importance of the internal control system in banks cannot be underestimated, given its crucial impact on banks' bottom-line results, their role in assessing and managing risks, complying with applicable laws and regulations, achieving business objectives, and improving banks' overall economic performance. An effective internal control system requires that risks which could negatively affect the achievement of the bank's objectives be continuously identified and assessed. Therefore, internal controls must be continuously adapted, particularly to economic conditions and in line with European and international best practices, to ensure that risks, especially new ones, are properly identified and mitigated.

Thus, improving the efficiency of the internal control system designed to mitigate the risks associated with banking activities is of considerable theoretical and practical interest, which underscores the importance of this research topic.

Description of the situation in the field. The proposed research topic is constantly evolving in scientific literature, and its practical foundation is continually updated in response to emerging risks and new trends in the banking sector. At the same time, from a theoretical perspective, there is a need to systematize the existing challenges related to organizing the internal control system and to identify reliable ways to increase its effectiveness.

Following a review of the specialized literature on the definitions of internal control and corporate governance, it was found that these definitions are very broad and open to interpretation, which highlights the fact that internal control is a complex concept due to its multiple aspects, and its meaning can be defined differently depending on the specific context. The theoretical and practical aspects of the role of internal control in mitigating banking risks have been addressed primarily in the works of foreign researchers such as Adams R., Akwaa-Sekyi E. K., Brajovic Bratanovic S., Gené J. M., O'Hara M., Metrejean E., Noland T. G., Pfister J. A., Syrotenko A., Van Greuning H. and those of Romanian economists - Dedu V., Chițan G.- and local economists - Bîrcă A., Bunea M., Ciobu S., Cociug V., Raiețchi E. and others.

The works and research of the authors mentioned are of significant value from both a theoretical and practical standpoint and have served as important references in the preparation of this paper. The issue of managing banking risks by improving the efficiency of the internal control system has not been addressed in depth in the Republic of Moldova, suggesting potential for further research and development in this area.

The purpose of the research is to identify, based on an examination of the internal control system in banks in the Republic of Moldova, ways to improve its efficiency to minimize banking risks, and to develop scientific and practical recommendations for their implementation.

Research objectives are:

- outlining the conceptual and theoretical framework of banking risk and internal control, as well as clarifying their essence and specific characteristics;
- analyzing the effects of banking risks and fraud on the banking system;
- developing a methodology to assess the quality of internal control in banks based on established key criteria;
- analyzing banking regulations in the Republic of Moldova regarding their compliance with EU standards and regulations applicable to banks in the internal control field;
- assessing the effectiveness of internal control in the Republic of Moldova's banks;
- identifying the control tools used by banks to ensure the effectiveness of the internal control system and the mechanisms applied by the banking supervisory authority to evaluate its functioning;
- elucidation on global challenges and trends regarding the internal control system organization;
- identifying opportunities to increase the efficiency of the internal control system with a view to mitigating banking risks;
- assessing the impact of the internal control system on the financial risks in the Republic of Moldova's banks;
- identifying avenues for improving and optimizing the internal control system in the Republic of Moldova's banks.

The research hypothesis which must be validated in order to achieve the proposed research objective is: "The effectiveness of the internal control system is a significant factor in mitigating banking risks; therefore, strengthening the components of internal control and integrating them into the corporate governance and risk management frameworks leads to a reduction in banks' exposure to financial risks, an increase in organizational resilience, and the strengthening of the stability of the banking sector in the Republic of Moldova.".

Research methodology. This research is based on studies by domestic and foreign researchers that address conceptual aspects related to the internal control system within financial and banking institutions. Thus, to conduct an in-depth study of the subject, the author examines reports, databases, and other information disseminated by international financial organizations, academic bibliographic sources, and relevant legislative and regulatory acts pertaining to international law, particularly that of the EU, and national legislation, as well as publications and data disseminated by the National Bank of Moldova, banks in the Republic of Moldova, commercial banks, and central banks abroad through their official websites, conferences, forums, articles, and specialized books. At the same time, the author's previous research and analyses served as a foundation for this work.

This study employs a *combined* method that includes both qualitative and quantitative assessments of the situation in the field. This study uses the quantitative method to identify factors and correlations among various elements of internal control, the objectives of internal control, and different types of risk within banks. This quantitative method is used in this study due to the need to identify factors and correlations among various elements of internal control, the objectives of internal control, and different types of risk within banks. The qualitative method is used to assess the effectiveness of control systems and risks in banks by verifying compliance with relevant legislation, regulations, and other normative acts. Additionally, the research includes a survey conducted via a questionnaire to assess respondents' perceptions regarding the effectiveness of the internal control system in banks.

The research employs a series of complementary methods. The *deductive* method bridges the gap between the theoretical framework for banking risk management within the internal control system and the applied analysis of how risks manifest. The *analytical* method is used to examine the internal control system and banking risks, while the *comparative* method highlights differences, similarities, and distinctive features among theoretical approaches, international practices, and the provisions of the regulatory framework for the banking system in the Republic of Moldova. These methods were supplemented by *economic and financial analysis*, *statistical analysis*, and *econometric analysis* to provide a theoretical foundation, conduct empirical evaluation, and validate the research results. At the same time, the *synthesis* method allows for the integration and correlation of research results to formulate conclusions and recommendations.

To achieve the proposed goal, the research adopts a predominantly causal-evaluative approach, which is also derived from the research objectives. Consequently, the established research types are justified because the study analyzed and explored the structure and effectiveness of internal controls in banks to reveal their effects on banking risks, as well as to assess and highlight the effects of banking risks on the banking system.

The research, which focuses on a comprehensive approach to the risk management framework, and analysing a range of factors related to both risk management in banks and ensuring effective internal control, covers, among other things, aspects of corporate governance and auditing, whose principles and theories, in turn, stem from other fields that influence them, such as finance, economics, accounting, law, management, and others. Consequently, this research is *interdisciplinary*. This study will help consolidate knowledge and clarify the variables relevant to identifying the measures needed to improve the effectiveness of internal control, as well as to determine the factors that will lead to risk mitigation within banks.

Approval of the work's results. The research results presented in the dissertation were disseminated through papers presented at 6 national and international scientific conferences and symposia. Furthermore, the research results were reflected in 9 published scientific papers. Thus, the total volume of published works on the topic of the dissertation is 9.60 author's sheets.

Volume and structure of the thesis. The thesis consists of the following sections: annotation, introduction, three chapters, general conclusions and recommendations, a bibliography of 173 titles, 17 appendices, 138 pages of main text, 18 figures, and 15 tables.

Keywords: risk, internal control, corporate governance, risk management, audit, compliance, organizational culture, operational process, accountability, transparency, monitoring, governing body, digitization, COSO, crisis, Basel III, emerging risk, line of defense, supervision, regulation, bank, banking sector.

CONTENTS OF THE THESIS

Chapter 1, *"Conceptual aspects of internal control in banks in the context of banking risks"*, provides an overview of the theoretical aspects related to the concept of internal control and analyzes the specific characteristics of the organization and functions of internal control in banks, as well as the role of internal control in managing banking risks and fraud. This chapter proposes a methodology for assessing the quality of internal control in banks, based on an evaluation of the relevant variables.

In the author's view, researchers have put forward an extensive set of concepts and definitions, indicating that no single definition or agreed-upon description of internal control exists. At the same time, there is a unanimous view that control is an independent function of the management system, which does not replace other functions but aims to ensure their effective use, and that the internal control system is one of the management tools for ensuring the security of the organization's assets.

Given the definitions provided, the author proposes defining internal control as "*a dynamic, complex, and interconnected system composed of specific components integrated into the bank's organizational culture, including policies, procedures, and mechanisms that ensure that the bank's activities are conducted efficiently and in accordance with the legal framework, with a focus on minimizing risks and based on the principles of a sound and prudent management structure*".

According to the author, an internal control system is effective if it can produce the expected results. Thus, the existence of rules, procedures, and mechanisms is a necessary but insufficient criterion for considering a control system to be effective, since, even if established, the control system may have deficiencies related to the application of controls, information flows, monitoring of vulnerabilities, adequate correlation with risks, or the implementation of corrective measures, etc. In this context, the effectiveness of the internal control system is assessed based on how its components function, interact, and enable the prevention, identification, monitoring, and mitigation of banking risks. *Thus, an effective internal control system reflects the ability of internal control mechanisms to achieve the expected results in accordance with the bank's objectives and risk profile, commensurate with the nature, scope, and complexity of the risks assumed.*

Currently, internal control should be viewed not merely as a management function, but as a distinct discipline within the realm of scientific knowledge; this idea is supported by the fact that both professional communities and regulatory bodies describe the requirements for effective internal control as a separate process. Consequently, the research conducted allows the author to note that although the concept of internal control is defined in various ways, with an emphasis on different aspects, the fundamental terms are found in most authors' definitions: internal control is the inspection, monitoring, maintenance, and regulation of an organization's activities, and its main objectives are to ensure that, from an economic standpoint, the organization's resources are used efficiently.

The organization of the internal control system is primarily influenced by a number of factors, including: the bank's size, organizational structure, scope, and types of activities; the goals and objectives of the internal control system established at the bank level; management's attitude toward the internal control system; the degree to which the bank's activities are computerized and digitized; the availability of resources; and the level of staff competence. The author notes that a bank's internal control system consists of a set of interdependent operational elements (bodies and mechanisms) that enable an objective assessment of the efficiency and effectiveness of a bank's financial transactions, the reliability of information, and the compliance of these operations and information with national legislation and the bank's internal documents. In carrying out and implementing internal control within the bank, various control methods and tools are used, such as observation, inspection, economic analysis, inventory, examination, reconciliation, measurement and testing, reporting and verification, and other control methods determined by each individual bank. Thus, the scope of the internal control system is the organizational component, represented by all people involved in the internal control system, who bear primary responsibility for carrying out the controls and play a key role in coordinating them [10].

Banking entities may establish their own internal control system, which must be continuously developed and improved to ensure that management maintains the fullest possible control over the bank's operations, as well as over each individual activity, with the aim of achieving the established objectives. At the same time, to establish their own internal control system, institutions require a foundation, *i.e.* a basic control framework.

A comparative analysis of the main conceptual frameworks for internal control allows the author to conclude that they do not provide a comprehensive solution for organizing and evaluating the internal control system (Table 1). Therefore, although the conceptual and cultural framework is provided by the integrated internal control framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO), as well as by the framework developed by the Canadian Institute of Chartered Accountants (CoCo) and by Turnbull, the BCBS framework provides a more relevant conceptual basis, better suited to the organization and assessment of internal control from a risk-based perspective.

According to the research, the author notes that, from a global perspective, internal control in its modern sense is based on the COSO principles, which currently serve as the foundation for internal control in practice - a process that is part of every organization's routine and carried out by both management and all employees, and the BCBS is among the most consistent institutions in applying the COSO concept (represented by five integrated elements: control environment, risk assessment, control activities, information and communication, and monitoring).

Table 1. A comparative analysis of the main internal control frameworks

Model	Advantages	Limitations	Contribution to the banking sector
COSO	It provides an integrated approach and a structured assessment of the functioning of internal control.	It is general in nature and must be adapted to the specific characteristics of banking activities; it does not establish standard quantitative indicators for assessing the quality of internal control.	It serves as a benchmark for organizing and evaluating internal control by aligning its components with the bank's objectives and risk tolerance.
CoCo	Emphasizes organizational culture, accountability, and employee competencies.	It is primarily qualitative in nature and provides limited guidance for quantifying internal control.	It helps foster a culture of risk and control, but it is not specifically designed for banks.
Turnbull	Integrates internal control with governance and risk management.	It is general in nature and lacks quantitative criteria for evaluating internal control.	It helps strengthen management's role in risk oversight and internal control.
BCBS	Designed for banks, it integrates supervision with risk management and internal control.	No single quantitative methodology exists for assessing internal control. The model's principles need to be adapted to the bank's size, risk profile, and complexity.	It provides a framework specific to the banking sector for organizing and evaluating internal control by aligning it with banks' risk profiles.

Source: prepared by the author based on a review of the relevant literature.

The conceptual framework provided by COSO is complemented by the three-lines-of-defense (3LoD) model and its extension, the four-lines-of-defense (4LoD) model, which should be able to anticipate potential risks, detect whether processes were carried out in accordance with procedures, and enable management to streamline the bank's operations based on the results achieved. Furthermore, its effectiveness can be gauged by its ability to reduce or mitigate most risks, and by employees' ability to collaborate with units in the other lines of defense to identify, assess, and mitigate risks, while ensuring effective communication and alignment with the bank's objectives. Some misconceptions exist about the need to review internal controls; they must be periodically updated and continually reviewed and should not be limited to their initial state at the time of establishment. Furthermore, a bank's size is not a determining factor in having internal control systems; all banks need them to ensure the integrity of operations, processes, and financial reporting.

A comparative analysis of corporate governance models, however, shows that the main difference between them lies in how responsibilities and powers are distributed among shareholders, the board of directors, and the executive body. At the same time, the author highlights the characteristic features of these models, which are: the independence characteristic of the Anglo-Saxon model; the transparency and ethics promoted by the Nordic model; the clear delineation of responsibilities within the German model; and the flexibility of the French model, in which entities are free to choose their management structure.

In recent decades, the banking sector's architecture has undergone significant development in risk management, driven by globalization and rapid technological trends, which have necessitated new processes and tools to improve internal control practices [4]. The author highlights that, from a banking supervision perspective, the relevance of risk depends on its prudential impact on banks, such as capital, liquidity, operational continuity, and compliance, while the internal control system serves as the mechanism through which the bank's strategy and risk appetite are translated into clear rules, processes, and controls.

Taking into account the types of analyses presented in Chapters 2 and 3, the author has identified the main banking risks (financial and non-financial risks with financial implications) that are also suitable for examining the relationships between these risks and internal banking controls, as follows: *credit risk, liquidity risk, market risk (including interest rate risk and foreign exchange risk), operational and business continuity risk (including compliance and integrity risk), emerging risks.* Continuing the research, and recognizing that risks do not occur in isolation, the author finds it useful to develop an integrated matrix of banking risks in which the COSO elements are correlated with the main types of risk. Consequently, the matrix proposed in this chapter illustrates how the principles of internal control are translated into prevention, detection, and correction tools tailored to banking risks. Additionally, the author highlights that there are cross-cutting elements that apply to all banking risks, such as the independence of control functions, data quality, the register of deficiencies, reporting of deviations, verification of corrective measures, as well as internal audit, which enables an independent assessment of the functioning of the internal control system.

At the same time, internal audit and the control system jointly contribute to risk management, each playing a distinct role. Thus, *risk management* aims to align the bank's exposures with its risk appetite and prevent losses from materializing; it focuses on identifying sources of risk and estimating the impact of uncertain events. *Internal audit* assesses the effectiveness of controls, supports and facilitates risk identification, develops recommendations to mitigate risks, and monitors the implementation of risk management strategies. In contrast, *internal controls* are ongoing, form part of the bank's day-to-day operations, and operate at every level; they enable the prevention, detection, and correction of risks, fraud, and errors. Thus, the internal control system encompasses financial, operational, strategic, and compliance processes, ensuring regulatory compliance, asset protection, and reliable financial reports. [11].

Based on the research conducted, the author develops and proposes a proprietary methodology for evaluating internal control in banks, grounded in the principles of *prudence and flexibility*. The author emphasizes that the methodology for evaluating the quality of a bank's internal control system combines and integrates quantitative and qualitative methods.

Regarding the **quantitative method**, the author deemed it necessary to identify a comprehensive set of representative indicators reflecting the elements of the COSO model (Table 2); these were identified and analyzed for relevance based on publicly available data and the author's research. The distribution and values of the quality scores for the indicators are determined by considering the range of variation for each indicator and the 20% weight assigned to each element of internal control.

Table 2. Assessment of the quality level of the internal control system, based on the quantitative method

Elements of internal control	Indicator name (C)	Weight	Quality score (PC)/range of variation			
			$0 < C \le 1$	$1 < C \le 2$	$2 < C \le 3$	$3 < C \le 4$
Control environment	Size of the bank's board (members)	20%	$3 \le C \le 7$	$7 < C \le 9$	$9 < C \le 11$	$C < 3$ or $C > 11$
	Experience of management body members, %		$100 \ge C \ge 80$	$80 > C \ge 40$	$40 > C \ge 20$	< 20
Risk assessment	Market risk, %	20%	≤ 20	$20 < C \le 40$	$40 < C \le 60$	> 60
	Liquidity risk, %		≥ 200	$200 > C \ge 150$	$150 > C \ge 100$	< 100
	Total capital ratio, %		≥ 30	$30 > C \ge 20$	$20 > C \ge 10$	< 10
	Credit risk, %		≤ 5	$5 < C \le 10$	$10 < C \le 15$	> 15
Control activities	Credit limit coverage, %	20%	≤ 40	$40 < C \le 60$	$60 < C \le 75$	> 75
	Compliance and prudence, %		≤ 60	$60 < C \le 80$	$80 < C \le 100$	> 100
	Human resources capacity, %		≤ 35	$35 < C \le 50$	$50 < C \le 65$	> 65
Information and communication	Reliability of financial reports, %	20%	Reports published on time, audited, with no findings	Reports published on time, audited, minor comments	Reports published late, audited with repeated comments	Financial reporting with material misstatements
	Operational efficiency ratio, %		≤ 40	$40 < C \le 60$	$60 < C \le 80$	≥ 80
Monitoring	Independence of the bank's board, %	20%	$100 \ge C \ge 80$	$80 > C \ge 50$	$50 > C \ge 33$	< 33

Source: prepared by the author.

The **qualitative method** for evaluating the quality of the internal control system is a comprehensive indicator calculated as the arithmetic mean of the scores in the evaluation table. In this regard, the qualitative method can be applied using a questionnaire, with questions structured according to the COSO elements.

To evaluate a bank's internal control system according to the proposed methodology, the following weightings are used: the quantitative method – 60%, and the qualitative method – 40%. This weighting reflects the relative importance of each method; the author justifies it by noting that the measurable indicators provide an objective basis for how internal control instruments are reflected in the risk profile of banking institutions. At the same time, since it is challenging to fully capture the effectiveness of the internal control system using only financial indicators, the qualitative method must supplement the quantitative data with perceptions of internal control in banks (e.g., risk culture, internal communication, organizational elements, etc.) that can only be captured by taking into account the experiences of their employees. Therefore, assigning a lower weight to the qualitative method contributes to a more balanced assessment of the quality of the internal control system for risk management purposes. Thus, the final assessment can be conducted based on the cumulative score derived from the two methods, as follows: high quality (≤ 1.50), average quality (1.50 < C ≤ 2.50), requires attention from the appropriate supervisory authority (2.50 < C ≤ 3.50), and low quality (>3.50); thus, a lower score indicates a higher level of quality, and vice versa. Subsequently, based on the average score assigned, the effectiveness of the bank's control system can be assessed, and ways to mitigate risks can be identified; this may lead to suggestions for changes in the bank's policy for the coming period or to the identification of areas requiring closer monitoring.

Chapter 2, *"Assessment of the Internal Control System and Risks in Banks in the Republic of Moldova"*, analyzes the regulations governing banking activities in the Republic of Moldova in the area of internal control and applies the methodology developed in Chapter 1 to assess the quality of the internal control system. Using statistical data on the banking sector in the Republic of Moldova for the years 2013–2025, the chapter analyzes banking performance indicators and risks associated with the banking system in the Republic of Moldova in the context of internal control. Additionally, the chapter discusses how banks' internal control systems are adapted to the complexity of banking risks.

The regulatory framework of the banking system in the Republic of Moldova is constantly evolving and highly sensitive to changes in both the domestic and international environments, which significantly affect the national economy. The Basel I Accord, adopted and implemented by the Republic of Moldova in 1998, aimed primarily to ensure the adequacy of banks' capital. Subsequently, although the BCBS has implemented the Basel II Accord, which builds upon the Basel I Accord and is based on three pillars: *minimum capital requirements, the prudential supervision process, and market discipline*, the Republic of Moldova has not adopted this framework. Following the revocation of the license of B.C. "Investprivatbank" S.A. in 2009 due to its deteriorating financial situation and inadequate management, the national regulatory framework was adjusted, including higher regulatory requirements for banks' capital, internal control systems, and corporate governance. The vulnerability of the national economy to external shocks was subsequently confirmed once again by the revocation of the license of B.C. "Universalbank" S.A., due in part to insolvency and violations of internal corporate governance through transactions with related parties.

However, the greatest failure of corporate governance in the history of the Republic of Moldova was marked by systemic fraud and enormous financial losses resulting from fraudulent lending and problems with corporate governance and internal controls during the period 2014–2015. Consequently, in 2015, the banks "Banca de Economii" S.A., B.C. "Banca Socială" S.A. and B.C. "Unibank" S.A. were affected by fraudulent asset depletion and subsequently failed; starting that year onward, numerous initiatives emerged to amend financial and banking legislation, emphasizing strengthening the regulatory and supervisory framework, improving corporate governance, and ensuring transparency of shareholding structures. This set of regulations was developed in response to the limitations identified in the implementation of the Basel I and II agreements. Consequently, the Republic of Moldova has directly adopted the Basel III framework, which focuses on developing a more robust banking sector capable of withstanding the impact of financial shocks, regardless of their origin, and on minimizing the risk of negative spillovers between the financial sector and the real economy. In addition to focusing on financial risks, Basel III also imposes principles designed to strengthen internal controls, aiming to reduce the likelihood of fraud, errors, or incorrect information that could affect technological systems [6], [7].

On January 1, 2018, the national legal framework was strengthened by Law No. 202/2017 on banking activities, which reflects the Basel III principles in accordance with the European CRD IV/CRR regulatory framework, providing a broader and more secure perspective on risk issues, rigorous rules for banking operations, a heightened level of prudence, and new intervention tools made available by the central bank [9]. Consequently, with the aim of improving the regulation and supervision of banking activities in the Republic of Moldova, Regulation No. 322/2018 on the Framework for Bank Management was implemented in 2018, which includes requirements regarding transparency and internal governance in banks; risk management; the Internal Liquidity Adequacy Assessment Process (ILAAP); and the Supervisory Review and Evaluation Process (SREP) [10].

In addition, the National Bank of Moldova, with technical support from the World Bank (WB) and the IMF, has continued to prioritize other banking sector reforms, including improving the quality of corporate governance within banks. Based on the research, the author notes that particular emphasis is placed on shareholder transparency in these banks, as most problems stem from the need for an adequate assessment of the quality of their owners. These essential elements of corporate governance must be addressed to ensure the development of sound corporate governance in the banking sector and, consequently, to attract investors with high-quality standards. Thanks to the measures taken by the NBM in recent years to improve transparency and the quality of the ownership structure, banking assets are controlled by international financial groups with solid reputations that meet quality criteria.

At the same time, the analysis shows that the update to the regulatory framework has had a positive impact, evident during recent crises, a period in which banks posted solid performance, managed the situation more effectively, and avoided major losses and the risk of bankruptcy, a stark contrast to the significant losses incurred during previous crises. A significant development in corporate governance has been noted, particularly due to the stricter requirements imposed by the National Bank of Moldova. In this regard, greater attention has been paid to evaluating internal control functions in banks, with an emphasis on risk management practices, including the proactive identification and assessment of risks, as well as ensuring a transparent organizational structure with well-defined responsibilities and an appropriate corporate culture, which includes the separation of duties and the independence of control functions.

Next, the author proposes applying the methodology for evaluating internal control in banks, developed in Chapter 1, to banks in operation as of the end of 2025. To this end, an analysis was conducted of the identified indicators and relevant information, as well as of the developed calculation algorithm.

To apply the **quantitative method**, based on the analysis of the indicators evaluated according to the developed calculation algorithm, Table 3 is presented, which includes the values of the indicators falling within the variation ranges established according to the identified thresholds and the quality score estimated individually for each weighted indicator (based on Table 1). Thus, if an internal control element is represented by multiple indicators, the element's weight is distributed proportionally among the selected indicators comprising it, so all indicators are considered to contribute equally to the score. At the same time, it should be noted that, under the methodology used, lower scores correspond to a higher level of quality.

Table 3. Quality level by component of the internal control system in banks in the Republic of Moldova, based on the quantitative method

Bank/ Element	MAI B	COM B	ECB	ENE G	EXI M	FCB	OTP	MIC B	PCB	VIC B
Control environment	0.50	0.13	0.25	0.13	0.50	0.00	0.25	0.38	0.25	0.50
Risk assessment	0.94	0.97	0.95	0.67	0.69	0.74	1.09	0.76	1.11	0.73
Control activities	1.96	1.79	2.24	2.52	2.28	2.02	1.92	1.87	2.29	1.39
Information and communication	0.67	1.90	1.80	1.48	1.67	1.41	1.10	0.95	1.69	1.22
Monitoring	2.42	1.17	2.59	2.00	2.42	2.98	1.67	0.17	2.59	1.29
Total score	**1.30**	**1.19**	**1.57**	**1.36**	**1.51**	**1.43**	**1.21**	**0.83**	**1.58**	**1.02**

Source: prepared by the author based on NBM data [1].

Based on the results obtained and taking into account the indicators deemed relevant for the quantitative assessment of the internal control system's performance, the author concludes that B.C. "Moldindconbank" S.A. records the highest performance, with a total quality score of 0,83 points, followed by B.C. "Victoriabank" S.A., with 1.02 points. Thus, the results suggest that these banks perform better under the quantitative method and have a robust internal control system. At the same time, the lowest score, at 1.58 points, was recorded by B.C. "ProCredit Bank" S.A. and B.C. "EuroCreditBank" S.A., at 1.57 points, suggesting that these banks have a lower-quality internal control system and greater exposure to risks or a more limited capacity to mitigate them.

In order to assess the quality of the internal control system using a qualitative approach, the author analyzed various available research methods. Thus, the use of a questionnaire survey was deemed an appropriate tool for assessing respondents' perceptions regarding the effectiveness of the internal control system in banks, as it would allow for the collection, processing, and analysis of data from primary sources, namely, employees in the banking sector of the Republic of Moldova. After distributing the questionnaires, 161 responses were collected.

Table 4. Quality level by component of the internal control system in banks in the Republic of Moldova, based on the qualitative method

Bank/ Element	MAI B	CO MB	ECB	ENE G	EXI M	FCB	OTP	MIC B	PCB	VIC B
Control environment	1.48	2.11	2.03	2.25	2.22	1.98	1.56	1.68	1.82	1.41
Risk assessment	1.66	2.10	2.25	2.25	2.28	1.89	1.58	1.73	1.78	1.57
Control activities	1.54	2.13	2.08	2.33	2.23	2.00	1.60	1.57	1.68	1.45
Information and communication	1.43	2.13	2.08	2.33	2.23	2.00	1.60	1.57	1.68	1.45
Monitoring	1.50	1.96	2.08	1.95	2.10	2.00	1.42	1.67	1.50	1.36
Total score	**1.52**	**2.08**	**2.13**	**2.22**	**2.21**	**1.95**	**1.54**	**1.65**	**1.68**	**1.43**

Source: prepared by the author based on the research.

Thus, based on the qualitative method (Table 4), drawing on the individual analysis conducted for each bank and the responses obtained from the questionnaire designed to assess the quality of internal control elements in banks in the Republic of Moldova, the best score of 1.43 was achieved by B.C. "Victoriabank" S.A., followed by B.C. "Moldova - Agroindbank" S.A., OTP Bank S.A., and B.C. "Moldindconbank" S.A., with scores of 1.52, 1.54, and 1.65, respectively. On the other hand, the weaker scores were recorded by B.C. "Energbank" S.A. (2.22), B.C. "Eximbank" S.A. (2.21), and B.C. "EuroCreditBank" S.A. (2.13). However, in the author's view, the banks that received weaker scores do not reflect major vulnerabilities, but rather indicate that there are components of internal control that would require additional attention, such as improving the quality of processes, information flow management, and communication, which, in turn, could impact the functioning of the bank's risk management system and the assessment of banking risks.

Taking into account the overall quality level (Table 5) of the internal control system (calculated using quantitative and qualitative methods), it can nevertheless be observed that internal control in systemic banks in the Republic of Moldova is implemented appropriately, falling within the first quality level (score ≤ 1.50), which also demonstrates a higher capacity for risk management, a fact that is understandable given their greater operational complexity.

Table 5. The overall quality of the internal control system in banks in the Republic of Moldova

Bank/ Method	MAIB	COMB	ECB	ENEG	EXIM	FCB	OTP	MICB	PCB	VICB
Quantitative method	1.30	1.19	1.57	1.36	1.51	1.43	1.21	0.83	1.58	1.02
Qualitative method	1.52	2.08	2.13	2.22	2.21	1.95	1.54	1.65	1.68	1.43
Total score	**1.39**	**1.55**	**1.79**	**1.70**	**1.79**	**1.64**	**1.34**	**1.16**	**1.62**	**1.19**

Source: prepared by the author based on the research.

Thus, the best score, 1.16, was recorded by B.C. "Moldindconbank" S.A., which was supported by the quantitative score for the monitoring component. B.C. "Victoriabank" S.A. recorded a score of 1.19 points, with both good quantitative and qualitative results, supported by the quantitative scores for the control environment and monitoring components under both methods. OTP Bank S.A. and B.C. "Moldova - Agroindbank" S.A. recorded scores of 1.34 points and 1.39 points, respectively; under both methods, the internal control components that achieved the best results were the *control environment*, *monitoring*, and *information and communication*. It is also important to note that most banks have results comparable to those of systemic banks, although they fall within the average quality level and recorded quality scores ranging from 1.55 in the case of B.C. "Comerțbank" S.A. to 1.79 in the case of B.C. "Eximbank" S.A. and B.C. "EuroCreditBank" S.A., and for a medium-sized or small bank, an effective control system is sometimes more critical to achieving solid financial stability. At the same time, based on the average score for the banking sector, the author estimates that the highest-quality component, according to both methods, is the *control environment*, while the *monitoring* component scored lower than the other elements of internal control.

Following the application of the methodology for assessing the quality of the internal control system, the research focuses on analyzing trends in banking activity indicators and risks within the banking system of the Republic of Moldova for the years 2013–2025, with a view to reflecting the context in which internal control instruments contribute to strengthening banking risk management. The analysis reveals that the domestic banking sector has grown and become more financially stable as a result of improvements achieved through banking regulation. An analysis of the trend in the share of foreign investments in banks' share capital shows that, at the end of 2025, this share stood at approximately 86.21%, representing an increase of approximately 13.97 percent compared to 2013. In the author's view, the high share of foreign investors and the trend toward consolidation in the banking system represent an advantage for adopting best practices in banking services and improving risk management processes and internal control systems.

At the same time, the gradual decline in the *risk exposure ratio relative to total assets* suggests that banks have consistently managed the balance between risk and total assets. In the author's view, this indicates the implementation of effective internal control strategies to keep risk exposure within acceptable limits. This expansion may have various implications, including increased portfolio diversification and the expansion of financial services offered to customers; however, sector growth also poses significant challenges for risk management and requires stronger internal control systems.

Furthermore, the banking sector in the Republic of Moldova recorded a significant increase in regulatory capital requirements, *i.e. total own funds*, during the period under review, rising steadily from approximately 8.17 billion MDL in 2013 to 23.53 billion MDL in 2025. This increase demonstrates the banks' ability to attract capital and, potentially, an increase in financial resilience in the face of risks. In the author's opinion, this could help the internal control system function more effectively, as banks can obtain additional resources by increasing their equity capital to manage risks and meet regulatory requirements, thereby strengthening the internal control system. Fluctuations in the capital adequacy ratio require special attention in internal control processes. To maintain a solid capital adequacy ratio, it is imperative to manage capital appropriately and conduct a constant assessment of risks [2].

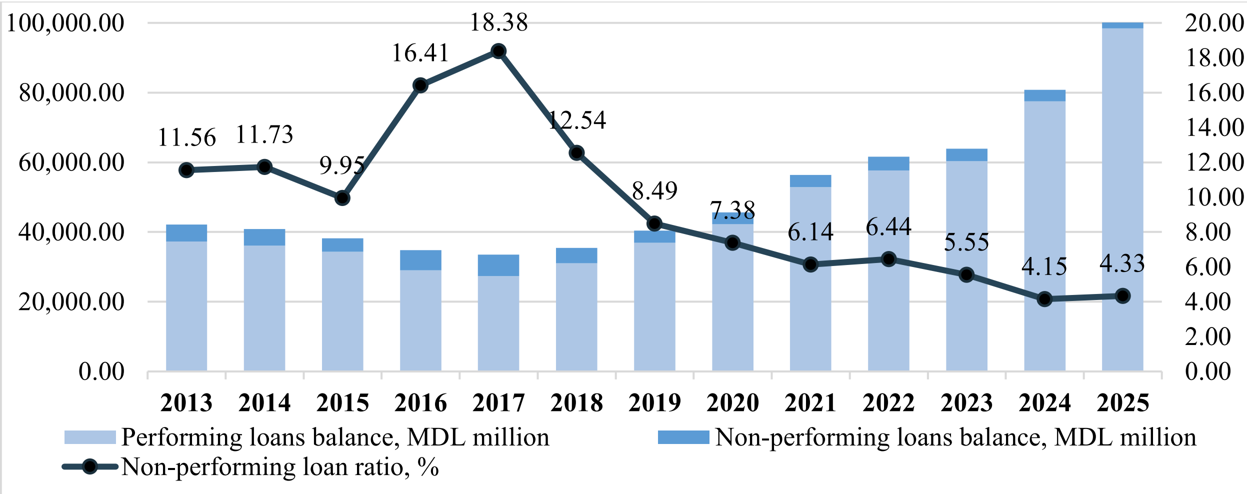

Figure 1. Trends in the total loan balance and the ratio of nonperforming loans to total loans in the banking sector of the Republic of Moldova from 2013 to 2025

Source: prepared by the author based on NBM data [1].

According to the author and the research conducted, a robust internal control system is necessary to mitigate credit risk, monitor the balance of non-performing loans (Figure 1), and streamline lending processes; furthermore, to ensure the stability and resilience of the banking sector in the Republic of Moldova in the face of future challenges, it is essential to adopt a proactive approach within the internal control system. Regarding the non-performing loan ratio, it decreased by approximately 7.23 percentage points, from 11.56% in 2013 to 4.33% in 2025, demonstrating a significant improvement in how the banking sector in the Republic of Moldova manages credit risk. The author concludes that growth in the size of the banking sector and the level of risk exposure underscore the importance of strengthened internal control practices, which are essential for maintaining stability and sustainability amid the ever-changing financial environment.

The results of the analysis of banking activity indicators provide an overview of how risks are evolving. Depending on these developments, the control system needs to adapt so that controls and procedures are appropriate to the risk profile. In this context, the author examines how banks' internal control systems adapt to the complexity of banking risks, emphasizing that the regulatory environment is constantly changing and that the risk management tools available to banks require continuous improvement. One of the most recent emerging risks has been the COVID-19 health crisis, which has had a major impact on the global economy. Consequently, the most significant risks for banks now include increased credit risk, as well as operational and business continuity risks. Thus, it is important to highlight several crucial elements that have enabled the Moldovan banking system to continue operating at a high and efficient level: these include improvements to the organizational structure, branch operations, performance evaluation and monitoring, operational optimization, business process automation, the implementation of home delivery services, and the enhancement of remote access channels.

According to the author's research, in order to adequately reflect the uncertainty caused by the COVID-19 pandemic and to mitigate risks, banks have applied international practices, such as revising the approach used to calculate macroeconomic effects or adjusting provisions based on rescheduled repayments for borrowers undergoing restructuring. Banks also periodically updated their forecasts in expected credit loss models, which include projections of macroeconomic indicators, and an increase in recognized provisions resulted from these changes [5].

The rapid advancement of technology has enabled banks to enter a new era, one that has radically changed business models and affected long-term visions. It is also worth noting the impact of financial technology (FinTech) on the internal control system; Thus, although new banking technologies, such as mobile apps, digital payments, automation, and artificial intelligence, enable process optimization, reduce the time required for tasks that were previously performed manually, and attract customers through convenience, they also entail a number of risks. Consequently, FinTech increases the importance of the internal control system, requiring it to expand to cover cybersecurity, business continuity, and supplier oversight.

At the same time, integrating environmental, social, and governance (ESG) risks has significantly transformed the bank's strategies and business management practices, as well as its internal control system and risk management processes. The diversity of ESG risks, as well as the creation and continuous updating of ESG-related regulatory frameworks, underscores the need to improve internal control systems to ensure adequate ESG risk management and to test resilience to financed emissions and climate change [3]. The main challenges include a lack of expertise among bank management, difficulty identifying qualified ESG personnel, and inadequately adjusted compensation policies.

The author believes that the findings presented have made it possible to outline the characteristics of the domestic banking sector's control system and the main banking risks, as well as to establish the first empirical arguments in support of the research hypothesis, and justify further research aimed at identifying ways to improve the internal control system in order to mitigate banking risks.

Chapter 3, "*Areas for improvement and optimization of the internal control system to mitigate banking risks*", includes an analysis of global challenges and trends regarding the organization of internal control systems and risk management, identifying opportunities to increase the effectiveness of internal control systems and mitigate banking risks. It also assesses the impact of the internal control system on banks' financial risks in the Republic of Moldova, based on econometric models using statistical data from 2013 to 2025, and identifies priority areas for improving and optimizing the internal control system in the Republic of Moldova.

For the purpose of the comparative analysis, the author selected countries with banking systems comparable to that of the Republic of Moldova and relevant experience implementing best practices in internal control and risk management, such as Romania, Poland, Georgia, Estonia, Latvia, and Lithuania. Common practices among the analyzed banking systems to mitigate operational and compliance risks include developing and maintaining control matrices that map processes, controls, risks, tests performed, and responsible parties. Regarding information technology, it is essential to treat IT risks as a single chain that integrates access controls, segregation of duties, traceability, documentation of changes, and management of information and communications technology incidents. Thus, taking these principles into account, the author notes that in international practice, the integrated approach prevails, enabling the creation and maintenance of an effective internal control system that can adapt to ongoing compliance and risk mitigation challenges.

The author goes on to highlight the main new trends and best practices that have led to changes resulting in the reorganization of the risk management framework and the internal control system in banks. Thus, aspects of digital transformation such as artificial intelligence (AI), machine learning, blockchain technology, robotic process automation, early warning systems, big data and predictive analytics, and cybersecurity provide the means for faster and more efficient controls. At the same time, given the pace of technological development, we may see the emergence of systems that enable more proactive prevention of violations. However, digital transformation also brings challenges, including data privacy and security, regulatory compliance, encryption, and access to sensitive information. Additionally, concerns that AI could impact cybersecurity, human resources, privacy, and the environment represent another challenge.

International practices show that, similar to investments in information systems, an institution's risk culture is also essential, and the main reason for this is that deficiencies in risk culture could weaken internal control systems in banks and put pressure on risk management. One area for developing the internal control system is strengthening the "tone at the top" principle, whereby the bank's board sets the decisions, standards of accountability, integrity, and risk tolerance that apply to the bank. At the same time, to keep employees engaged, banks are increasingly using remote training platforms, microlearning, and practices such as staff rotation. Effective cybersecurity also requires a strong risk culture, responsible and ethical employees, and ongoing training.

Another trend is the incorporation of ESG criteria into banks' frameworks, which helps them improve their image and build trust among shareholders and customers, ensure compliance with regulatory requirements, reduce financial and operational risks, and potentially improve performance. At the same time, the increased focus on ESG issues poses a significant challenge for banks' internal control systems, as identifying and monitoring ESG risks enables banks to respond more quickly to potential adverse events that could result in financial losses. To improve their internal control systems, manage risks effectively, and comply with new regulations, banks should adopt these practices and innovations; this will help ensure that the financial system remains robust and secure.

An analysis of international practices reveals that the effectiveness of an internal control system depends on its ability to adapt to banking risks, a finding that guides the author's analysis toward an empirical exploration of the topic. To empirically verify the relationships between the components of the internal control system and banks' financial risks, the author developed three regression models for financial risks.

To this end, the author proposes hypotheses based on the general idea that a robust internal banking control system, through the proper implementation of the COSO components, reduces banking risks. Thus, the null form of the hypotheses related to the analysis is formulated as follows: **H_{01}:** *A robust internal control system for banks in the Republic of Moldova does not have a significant impact on their credit risk;* **H_{02}:** *A robust internal control system for banks in the Republic of Moldova does not have a significant impact on their market risk;* **H_{03}:** *A robust internal control system for banks in the Republic of Moldova does not have a significant impact on their liquidity risk.*

To support the above ideas, a series of financial, prudential, and internal control indicators were used, observed on an annual basis for the 11 banks active in the Republic of Moldova in 2025, analysed over the period 2013–2025. The aim was to ensure comprehensive coverage of the domestic banking sector, which allows for both a reflection of the characteristics of the entire banking sector and identification of differences among banks.

Table 6. Description of the dependent variables

Acronym	Representative indicators
R_CRED	Credit Risk (Non-performing Loans / Total Loans)
R_PIATA	Market Risk (Foreign Currency Loans / Total Loans)
R_LICHID	Liquidity Risk (Long-Term Liquidity Ratio – Principle I)

Source: prepared by the author.

At the same time, the dependent variables (indicators used to quantify financial risks) were identified, as shown in Table 6, and the independent variables (which reflect internal control) were identified, as shown in Table 7.

Table 7. Description of independent and control variables

Type	Internal control elements	Acronym	Representative indicators
Independent variables	**Control environment**	DIM_CB	Size of the Bank's Board (Total number of members of the Bank's Board at year-end)
	Risk assessment	N_DEP	Estimated level of loan impairment (Calculated amount of the allowance for balance of credit debt/balance of credit debt)
		R_FP	Risk-absorption capacity (Total Equity Ratio or Risk-Weighted Capital Adequacy)
	Control activities	CR_TA	Credit Limit Coverage (Loans/Total Assets)
		CR_DEP	Compliance and Prudence (Loans/Deposits)
	Information and communication	EF_OP	Operating Efficiency Ratio (Operating Expenses Excluding Interest / Total Operating Revenue)
	Monitoring	AUDIT	Use of one of the top 6 audit firms (A binary variable that takes the value "0" if the financial statements were not audited by one of the top 6 audit firms and the value "1" otherwise)
Control variables		DIM_BANC	Bank Size (Variable measured by taking the logarithm of total assets)

Source: prepared by the author.

Multiple regression models estimated using the least squares method are generally expressed as follows:

$$Y_{it} = \beta_0 + \beta_1 \times X_{1,it} + \beta_2 \times X_{2,it} + \beta_n \times X_{n,it} + \varepsilon_{it} \quad (1)$$

where: Y - the dependent variable vector; n - the number of independent variables; i - the unit in the cross-sectional series; t - the time series dimension; β - the constant term; X - the independent variable; ε - stochastic error (the risk that other factors not included in the econometric model may influence banks' financial performance or risk management).

According to the results of the correlation matrix, during the period analyzed for the indicators of banks in the Republic of Moldova, there are significant relationships between financial risks and the internal control system of banks.

Table 8 presents the results obtained by applying the regression models.

Table 8. Regression models for financial risks

	Model 1		Model 2		Model 3	
	Dependent variable – credit risk		Dependent variable – market risk		Dependent variable – liquidity risk	
Variables	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**
C	-0.131*	0.070	0.527*	0.271	0.078	0.326
DIM_CB	0.002	0.002	-0.022***	0.008	-0.026***	0.009
N_DEP	1.599***	0.070	1.134***	0.268	0.429	0.323
R_FP	0.002	0.020	-0.040	0.078	0.059	0.094
CR_TA	-0.058	0.079	0.406	0.306	1.325***	0.368
CR_DEP	0.059	0.036	-0.179	0.141	-0.406**	0.169
AUDIT	0.015***	0.005	0.148***	0.020	-0.075***	0.024
EF_OP	-0.022*	0.013	-0.179***	0.052	-0.149**	0.062
DIM_BANC	0.004	0.003	-0.012	0.012	0.002	0.015
R^2	0.871		0.463		0.449	
Adjusted R^2	0.863		0.431		0.416	
F-statistic	112.440		14.354		8.926	
Prob (F-stat)	0.000		0.000		0.000	

Source: prepared by the author.

*** p<0.01, ** p<0.05, * p<0.1

The author finds that the variables related to the internal control system explain 87.1% of the variation in credit risk, 46.3% of the variation in market risk, and 44.9% of the variation in liquidity risk, and that the data exhibits a high level of relevance in the regression models. The explanatory power of market risk is lower, which can be explained by the fact that it is partially influenced by banks' internal instruments; however, a greater impact on this risk is driven by economic conditions, external shocks, financial market volatility, interest rates, or exchange rate fluctuations. As for the lower explanatory power of liquidity risk, this can be explained by the dynamic nature of liquidity risk, which depends not only on the bank's internal factors but also on changes in the structure and stability of funding sources, depositor behavior, and unforeseen funding needs.

At the same time, when assessing the impact of the internal control system on risks from the perspective of the COSO components represented by the variables used in the models, it is observed that: the *control environment* component had a significant impact on market and liquidity risks; the *risk assessment* component had a significant impact on credit and market risks; the *control activities* component had a significant impact on liquidity risk; and the *information and* *communication* and *monitoring* components had a significant impact on credit, market, and liquidity risks.

The results of the three models confirm that the independent variables included in the models explain the variation in credit risk, market risk, and liquidity risk and, therefore, suggest rejecting the null hypotheses (H_{01}, H_{02} and H_{03}) and accepting the alternative hypotheses of the models. Thus, the results provide further evidence in support of the research hypothesis and reinforce the idea that a robust internal control system has a significant impact on financial risks.

Based on the research findings, the author identified priorities for developing the bank's internal control system to improve its efficiency and minimize banking risks (Figure 2).

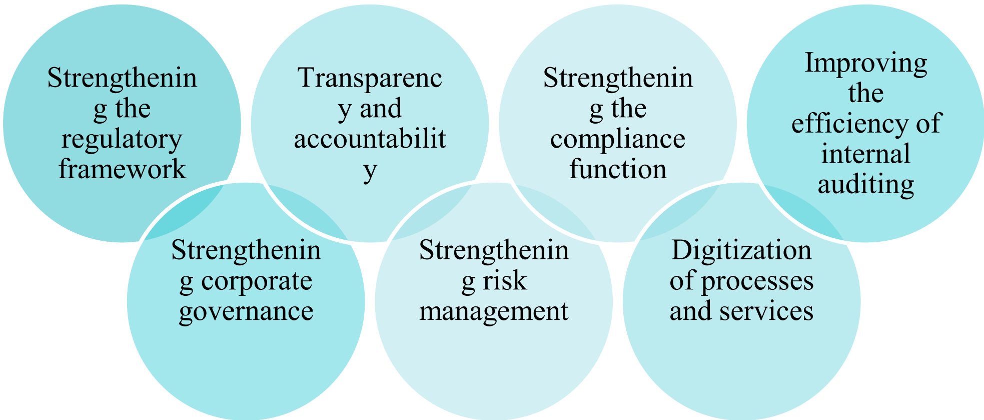

Figure 2. Priorities in developing the internal control system in banks in the Republic of Moldova

Source: prepared by the author.

In this context, the author has formulated recommendations to improve and optimize the internal control system in banks in the Republic of Moldova. With regard to strengthening *corporate governance*, it is recommended to consolidate the progress made in this area by: the NBM's prudent monitoring of corporate governance within Moldovan banks through various mechanisms, such as evaluating the performance and independence of members of management bodies, the effectiveness of bank committees, and sanctions; streamlining banks' internal governance by adopting updated corporate governance codes; expanding the rights of minority shareholders and increasing transparency in decision-making through mechanisms that could ensure the accountability of bank boards to these shareholders; and fostering a culture of accountability within banks' governing bodies.

To *strengthen risk management*, NBM could impose requirements to introduce a wider range of scenarios and integrate the results into decision-making processes related to ICAAP and ILAAP. Similarly, it is recommended that banks continue to develop their analytical capabilities both by designing and implementing IT systems for risk modeling and early warning systems, and by enhancing the skills of employees responsible for implementing the risk management function.

Among the recommendations for *strengthening the compliance function*, it is important to foster a culture of compliance throughout the bank, where employees are trained on zero tolerance for fraud and corruption, ethical standards, and methods for reporting incidents such as abuse and fraud. To enhance the *effectiveness of internal audit*, it is recommended that banks develop risk-based audit plans that cover as broad a range of areas as possible (e.g., credit modeling audits, cybersecurity, IT processes, emerging risks), taking into account banks' ongoing digital transformation. Regarding the *digitization of banking services*, the highlighted recommendation states that the bank's board must set the risk appetite for digitization-related innovations and approve a FinTech strategy, establishing roles and responsibilities across all lines of defense.

A key aspect of internal control quality is bank transparency through the communication and publication of accurate, necessary, and timely information to shareholders, customers, and other stakeholders. The *accountability* of banks' management bodies is also a factor that stems from robust internal control, resulting from sound decisions made by management that can be justified to shareholders and other stakeholders [8]. At the same time, the recommendations include incorporating ESG risks into banks' internal risk policies, including specific risk indicators (e.g., reputational risk, climate risk). Furthermore, the author suggests developing and adapting internal IT systems to enable automated alerts regarding ESG exposures, as well as reporting to the relevant committees and management bodies.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

Theoretical research has facilitated a deeper understanding and synthesis of theoretical and practical concepts related to internal control, corporate governance, and banking risks. At the same time, the conceptual distinction between internal control, internal audit, and risk management has made it possible to outline a clearer structure for banking governance mechanisms. Consequently, the author highlights that the concept of internal control has become a complex framework, regarded as a strategic mechanism for achieving organizational objectives. Furthermore, the study of researchers' contributions in the field has facilitated the development of the author's own conception of internal control, defining it as *"a dynamic, complex, and interconnected system composed of specific components integrated into the bank's organizational culture, including rules, procedures, and mechanisms that ensure the bank's operations are conducted efficiently and in compliance with the legal framework, with a focus on minimizing risks and based on the principles of a sound and prudent management structure".* Therefore, the results confirm that the first objective of the research - *outlining the conceptual and theoretical framework of banking risk and internal control, as well as clarifying their essence and specific characteristics* has been achieved in Chapter 1.

The second objective, addressed in the same chapter and related to *the analysis of the effects of banking risks and fraud on the banking system*, highlighted that banks' risk profile is a key factor in designing and evaluating the internal control system. At the same time, the research highlights that internal control is the tool through which the bank's strategy and risk appetite are translated into clear policies, rules, and processes. The research also enabled the author to develop an integrated risk matrix, in which the COSO elements are correlated with the main banking risks. The third objective of the research – "*developing a methodology to assess the quality of internal control in banks based on established key criteria*", was also addressed in Chapter 1. To achieve this objective, the author developed a proprietary methodology for evaluating the quality of a bank's internal control system, based on a combination of quantitative methods (using representative financial indicators of banks that reflect elements of the COSO model) and qualitative methods (based on a survey conducted by the author using the questionnaire presented in the appendix attached to the thesis). Consequently, the methodology enables an integrated assessment of the effectiveness of the internal control system by incorporating indicators related to corporate governance, risk management, and operational processes, which allows for an evaluation of the contribution of internal control to mitigating banks' risks.

One of the objectives achieved in Chapter 2 was *“analyzing banking regulations in the Republic of Moldova regarding their compliance with EU standards and regulations applicable to banks in the internal control field”*, which constitutes the fourth objective of the research. Thus, the research analyzed the evolution of regulations in the Republic of Moldova, particularly in relation to the Basel principles and European practices, reflecting a gradual shift toward a risk-based approach. The research findings showed that regulations significantly contribute to mitigating banking risks, as they are implemented through preventive, detective, and corrective controls tailored to banks’ risk profiles. Additionally, the improvements achieved through the regulation of banking activities in the domestic banking sector were assessed by analyzing banking activity indicators and the risks of the banking system in the Republic of Moldova for the period 2013–2025. The analysis of trends in banking activity statistics reflects a positive trend, with the banking sector characterized by profitability, excess liquidity, and overcapitalization, indicating financial resilience to risks, as well as strengthened financial stability and operational resilience.

The analysis of trends in banking activities and risks, supplemented by the application of the methodology developed in subsection 1.4, also supported the achievement of the fifth objective of the research - *assessing the effectiveness of internal control in the Republic of Moldova’s banks*. Thus, based on the results of the developed and applied methodology, the author demonstrates that domestic banks have a medium-to-high level of quality, while also emphasizing the need for continuous improvement of the internal control system as an important factor in strengthening the banks’ financial position. According to the research findings, the highest rating for the effectiveness of internal control (based on quantitative and qualitative methods), at 1.16 points, was recorded by B.C. “Moldindconbank” S.A., followed by B.C. “Victoriabank” S.A. (1.19 points), OTP Bank S.A. (1.34 points), and B.C. “Moldova - Agroindbank” S.A. (1.39 points).

The analyses conducted in the same chapter also enabled the author to *identify the control tools used by banks to ensure the effectiveness of the internal control system and the mechanisms applied by the banking supervisory authority to evaluate its functioning*, as outlined in the sixth research objective. Thus, at the NBM level, prudential reporting, supervisory and intervention measures, recommendations, and sanctions imposed by the National Bank of Moldova can be considered tools that contribute to holding banks accountable, detecting deficiencies, and mitigating risks arising from vulnerabilities in the areas of internal control, corporate governance, compliance, or risk management. At the same time, the author emphasizes that the effectiveness of banks’ internal control systems in mitigating banking risks depends on how and to what extent strategy, policies, procedures, and organizational structure are integrated into operational and decision-making processes. Among the control tools used by banks, the author highlights exposure limits by sector and borrower; segregation of duties; the use of early warning indicators; stress testing; continuous monitoring; and business continuity plans.

Objectives 7 and 8, which focused on *elucidating global challenges and trends regarding the internal control system organization* and *identifying opportunities to increase the efficiency of the internal control system with a view to mitigating banking risks*, were addressed in Chapter 3. Thus, the research findings revealed that trends aimed at enhancing the effectiveness of the internal control system, with a view to overcoming challenges, mitigating banking risks, and improving operational resilience include: the use of advanced data analytics and information technologies, the implementation of AI models, continuous investment in IT security, regular testing of business continuity plans, and the incorporation of ESG factors. At the same time, implementing these trends and innovations can alter banks' risk profiles, creating challenges related to cybersecurity, data protection, business continuity, and employee competencies in these areas. Furthermore, the importance of risk culture is emphasized, as deficiencies in this culture could weaken internal control systems in banks and put pressure on risk management. Furthermore, the effectiveness of the control system can be strengthened by maintaining a healthy organizational culture, setting the "tone at the top," and providing ongoing professional training for employees.

To achieve the next objective - *assessing the impact of the internal control system on the financial risks in the Republic of Moldova's banks,* the results of scientific research in the specialized literature were examined, and econometric models were applied. Thus, using financial, prudential, and internal control indicators from 2013 to 2025, a statistical analysis was conducted to support the selection of variables for developing econometric models. Following the testing of the three multiple regression models, based on the least squares method, the variables that had a significant impact on financial risks were identified, such as: "estimated level of loan impairment," "credit limit coverage," "operational efficiency ratio," and "use of one of the top 6 audit firms". Consequently, the existence of significant relationships between credit, liquidity, and market risks and banks' internal control systems was empirically confirmed.

At the same time, a review of research findings on the experiences of regional banking systems, the recommendations of international financial institutions, and international and national best practices, as well as an analysis of the domestic banking system, particularly aspects related to the effectiveness of internal control in banks in the Republic of Moldova, have made it possible to *identify avenues for improving and optimizing the internal control system in the Republic of Moldova's banks*, in accordance with the provisions of the 10th objective of this paper. The main directions for developing the internal control system in domestic banks suggested by the author include: the strengthening by the NBM and other relevant authorities of the national regulatory framework by harmonizing it with EU requirements and continuously developing it in line with changes in the European framework; strengthening corporate governance through increased transparency, involving minority shareholders in the decision-making process, and ensuring a high level of accountability among management bodies; strengthening the risk management function within banks; utilizing IT systems for risk modeling and early warning systems, and continuously enhancing the IT infrastructure; continuously strengthening the compliance function by fostering a culture of compliance and organizational culture; ensuring the functional independence of internal audit activities and developing expertise in emerging risk areas; embracing FinTech by having the bank's board set the risk appetite for innovations; reducing tolerance for deviations and mitigating the risks of ineffective decision-making, etc.

An analysis of the banking sector's regulatory framework in the Republic of Moldova indicates that the challenges posed by emerging risks and new trends in the field necessitate continuous alignment with international best practices, which will help strengthen investor and stakeholder confidence in the stability of the domestic banking sector.

In conclusion, the research achieved its purpose and met the stated objectives. At the same time, the analysis of the results validated the research hypothesis, according to which strengthening the components of internal control and integrating them into the framework of corporate governance and risk management leads to a reduction in banks' exposure to financial risks, an increase in organizational resilience, and the strengthening of the stability of the banking sector in the Republic of Moldova.

The scientific novelty and originality of this work lie in the development of theoretical approaches and methodological positions regarding the development of internal control as a management function and system. The scientific results, which are novel, obtained personally by the author, and presented for defense, consist of the following**:**

- developing the conceptual framework for internal banking controls by integrating the principles of corporate governance and risk management;
- developing a specific definition of internal banking control, tailored to the particularities of the banking sector in the Republic of Moldova;
- developing an integrated methodology for assessing the quality of banks' internal control systems, based on quantitative and qualitative indicators;
- identifying mechanisms for adapting internal controls to emerging banking risks, including in the context of digitalization and ESG requirements;
- an empirical assessment of the impact of domestic banks' internal controls on financial risks, using 3 econometric models;
- developing a set of recommendations to improve the efficiency of the internal control system, aimed at mitigating banking risks and strengthening corporate governance.

The important scientific problems solved in the thesis involve the theoretical, methodological, and practical foundations for approaches to improving the efficiency of the internal control system as a mechanism for mitigating banking risks. The research led to the development of a methodology for assessing the quality of the internal control system and to the identification of the impact of internal control elements on financial risks, with a view to putting the results obtained and the recommendations formulated into practice, so that the internal control system is treated as an essential tool for mitigating risks and strengthening risk management capabilities within banks in the Republic of Moldova.

The theoretical importance of the results of this research lies in providing a foundation for the conceptual aspects related to the evolution of internal control, corporate governance, the organization and functions of internal control within banks, banking risk management systems, and the development of a methodology for assessing the quality of the internal control system. At the same time, the national regulatory framework was analyzed in parallel with European standards, particularly the Basel requirements, to identify their evolution and benefits for the banking sector of the Republic of Moldova. Thus, this research contributes to the development of the scientific literature on internal control and the relationship between its effectiveness and the mitigation of banking risks.

Applicative value of the thesis is reflected in the fact that the research results can be applied to increase organizational resilience and strengthen and improve the stability of the banking sector in the Republic of Moldova, as evidenced by:

- the possibility of using the internal control system quality assessment tool, developed as part of the research, by banks for internal self-assessment, by the supervisory authority to conduct comparative analyses among banks, and by researchers to expand investigations into the relationship between the internal control system and banking risks;
- applying a set of financial, statistical, and econometric analysis methods and models to assess the quality of internal controls and evaluate their relationship to financial risks, based on statistical data from the banking system of the Republic of Moldova;

- developing practical proposals for improving the efficiency of the internal control system, with a focus on strengthening its ability to prevent, detect, and mitigate banking risks;

- promoting the use of research findings as supporting material for academic training, which can be utilized in the development of university courses or modules within professional training programs in the fields of finance and banking, auditing, risk management, internal control, and corporate governance.

Implementation of scientific results. The methodological guidelines and related practical recommendations for improving the control system by reducing banks' exposure to risks were accepted, and OTP Bank S.A. and B.C. "Moldindconbank" S.A. expressed their support for them.

Based on the research conducted in accordance with the proposed purpose and objectives, as well as the conclusions drawn, the author has formulated the following **recommendations** for improving the efficiency of the internal control system within banks in order to mitigate risks:

- Consider the following definition of internal control, in order to provide a comprehensive picture of its role within banks: *"Internal control is a dynamic, complex, and interconnected system composed of specific components integrated into the bank's organizational culture, including policies, procedures, and mechanisms that ensure that the bank's activities are conducted efficiently and in accordance with the legal framework, with a focus on minimizing risks and based on the principles of a sound and prudent management structure"*.

- Adapting the framework for managing the banks' operations, as well as the processes and mechanisms provided for by the banks' internal control systems, so that they are comprehensive and tailored to the nature, scope, and complexity of the risks inherent in the business model and the activities carried out by the banks.

- Implementing and adapting the integrated risk matrix within banks by directly linking banking risks to the COSO components of the internal control system, establishing representative indicators, limits, and alert levels, as well as designating the department responsible for monitoring and taking corrective action.

- Continually strengthening banks' internal control systems by improving the quality of corporate governance, including by enhancing the independence, competence, and experience of board members; optimizing the quality of processes; streamlining the management of information flows; strengthening risk management and assessment processes; and improving representative indicators used in the assessment (e.g., "credit limit assurance," "compliance and prudence," "human resource capacity," and "operational efficiency ratio"), particularly in the case of banks for which the assessment conducted in subsection 2.2 revealed an average level of internal control system quality.

- Application of the integrated methodology for evaluating the quality of the control system, based on quantitative and qualitative indicators, developed in subsection 1.4 and implemented in subsection 2.2 by the author. At the same time, it is recommended to develop and periodically apply econometric models to estimate the impact of the internal control system on banking risks, using a wide range of representative indicators and granular datasets, depending on the type of risk, as suggested in subsection 3.2. It is recommended that the results obtained be reviewed periodically and compared over time to identify areas requiring improvement; these findings can serve as the basis for management's decision-making regarding risk appetite, lending strategy, service/product development, or IT system adaptation.

- Improving the quality, governance, and communication of data in risk reporting by developing continuous risk monitoring functions through process digitization, the incorporation of artificial intelligence, the automation of controls, ensuring data traceability, and the analysis of trends and early warning indicators, with a view to preventing or mitigating risks and implementing corrective measures.

- Develop and refine an organizational culture focused on risk mitigation by promoting the continuous development of the professional knowledge and skills of staff involved, particularly in emerging risk management. To support improvement of the internal control system, it is recommended to regularly analyze trends in relevant indicators such as staff turnover, warnings received, and recorded violations, and to monitor and use them to strengthen the bank's ability to respond appropriately to risks.

- It is recommended that management focus on developing the organizational culture at the bank level, using periodic staff surveys conducted through anonymous questionnaires to assess the work environment within the banking institution.

- Ensuring a robust framework for reporting violations, through which staff or customers can report them; protecting whistleblowers; and reviewing procedures and segregating responsibilities, which, in turn, will improve transparency and contribute to more effective internal control.

- Improving communication and transparency by regularly publishing information related to the activities of internal control functions, corporate governance, the integration of ESG factors, and other emerging risks, in order to maintain compliance with high control standards.

- Strengthening and improving the efficiency of corporate governance in banks by expanding the rights of minority shareholders and increasing transparency in decision-making, through mechanisms that could ensure the accountability of bank boards to these shareholders; creating a culture of accountability within bank management bodies, so that their members are evaluated based on results, using data provided by internal audit, compliance, and risk management (e.g., adherence to limits, reduction in incidents, severity of findings).

- Integrating proprietary generative artificial intelligence platforms into banks' operations, adopting FinTech and advanced IT systems, thereby enhancing security and efficiency. To this end, it is recommended to develop strategic plans and create unified, real-time platforms that integrate various automated governance, risk, and compliance solutions, enabling risk forecasting and monitoring, as well as operational efficiency through activities such as analyzing loan agreements, identifying suspicious transactions, verifying regulatory compliance, etc.

In addition, the author made recommendations to the supervisory authority:

- Ensuring the institution's ongoing digital transformation (SupTech) to enable the NBM to manage supervision effectively.

- Developing a regulatory framework for internal control in banks, in line with EU standards and best practices (*e.g.* Poland, Estonia, Lithuania, Latvia), which will include recommendations and guidelines on business continuity, control, and auditing of IT, cyber, ESG, and other emerging risks.

- Implementing a code of conduct for the banking sector that would establish the essential ethical principles that every bank and employee should follow.

The findings of this research are particularly important for expanding the concept of internal banking control and for evaluating the internal control system within the banking sector.

Thus, the thorough review of the scientific literature on internal control and its relationship to banking risks presented in this paper enables the use of its methodological components in the training of specialists in this field. The findings of this research could serve as supporting material for academic training and could be used to develop university courses or modules within professional training programs in finance and banking, auditing, risk management, internal control, and corporate governance.

Limitations of the study. Given the nature of the study, there are certain limitations related to both methodology and the data used. Thus, the lack of publicly available data on internal control system operations necessitated assessing certain aspects using indirect indicators. At the same time, using a questionnaire to evaluate COSO elements may introduce subjective elements. Another limitation is the possibility that there are representative indicators of internal control that were not used in this study, particularly due to the lack of publicly accessible data or records. Nevertheless, the author believes these limitations do not detract from the value of the results but instead point to directions for future research.

Future research directions may focus on extending the application of the methodology for assessing the quality of the internal control system to other banking systems or financial institutions to conduct a comparative analysis and verify the stability of the results. Future research may involve developing complex models for assessing the maturity of internal control systems, including artificial intelligence methods and machine learning algorithms, to allow more in-depth identification of internal control deficiencies. At the same time, another area of focus involves quantifying emerging risks by developing indicators for cyber risk and ESG risk, utilizing artificial intelligence, and integrating these indicators into the methodology to analyze their impact on the bank's internal control system.

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ADNOTARE

CARA Ion, „Atenuarea riscurilor bancare prin eficientizarea sistemului de control intern”, teză de doctor în științe economice, Chișinău, 2026.

Structura tezei de doctor: adnotare, introducere, 3 capitole, concluzii generale și recomandări, bibliografie din 173 de titluri, 17 anexe, 138 de pagini de text de bază (până la Bibliografie), 18 figuri, 15 tabele. Rezultatele obținute sunt publicate în 9 lucrări științifice.

Cuvinte-cheie: risc, control intern, guvernanță corporativă, gestionarea riscului, audit, conformitate, cultură organizațională, proces operațional, responsabilitate, transparență, monitorizare, organ de conducere, digitalizare, COSO, criză, Basel III, risc emergent, linie de apărare, supraveghere, reglementare, bancă, sector bancar.

Domeniul de studiu: științe economice.

Scopul lucrării: identificarea, pe baza examinării mecanismelor sistemului de control intern în băncile din Republica Moldova, a direcțiilor de eficientizare a acestuia, orientate spre minimizarea riscurilor bancare și elaborarea recomandărilor științifice și practice pentru implementarea acestora.

Obiectivele cercetării: trasarea cadrului conceptual-teoretic al riscului bancar și controlului intern; analiza efectelor riscurilor și fraudelor bancare asupra sistemului bancar; elaborarea unei metodologii pentru a evalua calitatea controlului intern în bănci; analiza reglementărilor activității bancare în Republica Moldova cu privire la corespunderea acestora standardelor și reglementărilor UE aplicabile băncilor în domeniul controlului intern; evaluarea eficacității controlului intern în băncile din Republica Moldova; identificarea instrumentelor de control utilizate de bănci pentru asigurarea eficacității sistemului de control intern și a mecanismelor aplicate de către organul de supraveghere bancară pentru evaluarea funcționării acestuia; elucidarea provocărilor și tendințelor globale privind organizarea sistemului de control intern; determinarea oportunităților de creștere a eficienței sistemului de control intern orientate spre atenuarea riscurilor bancare și consolidarea guvernanței corporative; evaluarea impactului sistemului de control intern asupra riscurilor financiare ale băncilor din Republica Moldova; identificarea unor direcții de îmbunătățire și optimizare a sistemului de control intern în băncile din Republica Moldova.

Noutatea și originalitatea științifică a rezultatelor obținute rezidă în identificarea aspectelor teoretice privind controlul intern în bănci în contextul guvernanței corporative și precizarea conceptuală a acestuia prin dezvoltarea unei definiții proprii; elaborarea unei metodologii integrate de evaluare a calității sistemului de control intern a băncilor; identificarea mecanismelor de adaptare a controlului intern la riscurile bancare emergente; evaluarea empirică a impactului controlului intern a băncilor autohtone asupra riscurilor financiare; fundamentarea unui set de recomandări pentru eficientizarea sistemului de control intern, orientate spre diminuarea riscurilor bancare și consolidarea guvernanței corporative.

Semnificația teoretică și valoarea aplicativă: aportul teoretic derivă din fundamentarea aspectelor conceptuale aferente evoluției controlului intern, guvernanței corporative, organizării și funcțiilor controlului intern în cadrul băncilor, sistemelor de gestionare a riscurilor bancare și elaborării metodologiei de evaluare a calității sistemului de control intern. Valoarea aplicativă a cercetării rezidă în posibilitatea utilizării instrumentului de evaluare a calității sistemului de control, elaborat în cadrul cercetării, la nivelul băncilor; aplicarea unui ansamblu de metode și modele de analiză financiară, statistică și econometrică pentru aprecierea calității controlului intern și evaluarea relației acestuia asupra riscurilor financiare; elaborarea propunerilor aplicative în privind eficientizarea sistemului de control intern orientate spre consolidarea capacității acestuia de prevenire, detectare și diminuare a riscurilor bancare precum și valorificarea rezultatelor cercetării ca material de suport pentru formare academică.

Rezultatele obținute care contribuie la soluționarea unei probleme științifice importante constau în fundamentarea teoretică, metodologică și aplicativă a direcțiilor de eficientizare a sistemului de control intern ca mecanism de atenuare a riscurilor bancare. Cercetarea a condus la elaborarea metodologiei de evaluare a calității sistemului de control intern și la identificarea impactului elementelor controlului intern asupra riscurilor financiare, în vederea valorificării practice a rezultatelor obținute și a recomandărilor formulate, astfel încât sistemul de control intern să fie tratat ca un instrument esențial în vederea diminuării riscurilor și consolidării capacității de gestionare a acestora în cadrul băncilor din Republica Moldova.

Implementarea rezultatelor științifice: rezultatele cercetării au fost apreciate de către OTP Bank S.A., precum și de B.C. „Moldindconbank” S.A., aprecierea fiind confirmată prin certificatele de implementare anexate la teză.

ANNOTATION

CARA Ion, "Mitigating banking risks by streamlining the internal control system", PhD thesis in economics, Chisinau, 2026.

Thesis structure: annotation, introduction, 3 chapters, general conclusions and recommendations, bibliography of 173 titles, 17 annexes, 138 basic text pages (up to the Bibliography), 18 figures, 15 tables. The research is reflected in 9 scientific publications.

Keywords: risk, internal control, corporate governance, risk management, audit, compliance, organizational culture, operational process, accountability, transparency, monitoring, governing body, digitization, COSO, crisis, Basel III, emerging risk, line of defense, supervision, regulation, bank, banking sector.

Field of study: economics.

The purpose of the research: based on an examination of the mechanisms of the internal control system in banks in the Republic of Moldova, the research aims to identify areas for improving its efficiency, with a focus on minimizing banking risks, and to develop scientific and practical recommendations for implementing the proposed measures.

The objectives of the research: outlining the conceptual and theoretical framework of banking risk and internal control; analyzing the effects of banking risks and fraud on the banking system; developing a methodology to assess the quality of internal control in banks; analyzing banking regulations in the Republic of Moldova regarding their compliance with EU standards and regulations applicable to banks in the internal control field; assessing the effectiveness of internal control in the Republic of Moldova's banks; identifying the control tools used by banks to ensure the effectiveness of the internal control system and the mechanisms applied by the banking supervisory authority to evaluate its functioning; elucidation on global challenges and trends regarding the internal control system organization; identifying opportunities to increase the efficiency of the internal control system with a view to mitigating banking risks; assessing the impact of the internal control system on the financial risks in the Republic of Moldova's banks; identifying avenues for improving and optimizing the internal control system in the Republic of Moldova's banks.

The scientific novelty and originality of the results obtained lies in identifying the theoretical aspects of internal control in banks within the context of corporate governance and clarifying its conceptual framework by developing a definition of our own; developing an integrated methodology for assessing the quality of banks' internal control systems; to identify mechanisms for adapting internal control to emerging banking risks; to conduct an empirical assessment of the impact of domestic banks' internal control on financial risks; and to formulate a set of recommendations for improving the efficiency of the internal control system, aimed at mitigating banking risks and strengthening corporate governance.

Theoretical significance and practical value of the paper: the theoretical contribution stems from the analysis of conceptual aspects related to the evolution of internal control, corporate governance, the organization and functions of internal control within banks, banking risk management systems, and the development of a methodology for assessing the quality of the internal control system. The practical value of the research lies in the possibility of using a developed tool to assess the quality of the control system, applying a set of financial, statistical, and econometric methods and models to assess the quality of internal control and evaluate the impact of internal control elements on financial risks; the development of practical proposals for improving the efficiency of the internal control system, aimed at strengthening its capacity to prevent, detect, and mitigate banking risks; and the use of the research results as supporting material for academic training.

The obtained results, which contribute to solving an important scientific problem, consist of the theoretical, methodological, and practical foundations for improving the efficiency of the internal control system as a mechanism for mitigating banking risks. The research led to the development of a methodology for assessing the quality of the internal control system and to the identification of the impact of internal control elements on financial risks, with a view to putting the results obtained and the recommendations formulated into practice, so that the internal control system is treated as an essential tool for mitigating risks and strengthening risk management capabilities within banks in the Republic of Moldova.

Implementation of the scientific results: the research results have been endorsed by OTP Bank S.A., as well as by B.C. "Moldindconbank" S.A.; these commendations were confirmed by the implementation certificates attached to the thesis.

CARA ION

MITIGATING BANKING RISKS BY STREAMLINING THE INTERNAL CONTROL SYSTEM

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Summary of doctoral thesis in economic sciences

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