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IDENTIFYING THE CRITERIA OF EFFICIENT SUPERVISION TO MAINTAIN THE VIABILITY OF THE BANKING SYSTEM

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Abstract of the doctoral thesis in economic sciences

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CONCEPTUAL GUIDELINES OF THE RESEARCH

The actuality and importance of the research topic. The financial crises of the 21st century have highlighted the vulnerabilities of the financial and banking sector and led to a rethinking of the international regulatory and supervisory framework for the banking sector. A historical and geographical review of economic crises shows that the most resounding ones were banking crises, with systemic effects and a knock-on impact on national and global economies. More and more experts argue that crisis prevention is a more efficient and less costly option than leaving developments to market rules. Thus, banking supervision has taken on an interventionist stance, and measuring the effects of supervision has become a stage in the supervisory process. Supervisory authorities must demonstrate that their efforts and actions are producing results and effects, and that banking supervision is efficient.

The new regulations, in particular those promoted by the Basel III standards, aim to strengthen the capacity of supervisory authorities to manage banking risks and prevent financial crises. The transposition of the Basel III requirements in the Republic of Moldova has resulted in the creation of a new banking law, designed to strengthen the stability of the banking system, improve the resilience of the sector, and reduce the risk of contagion from the financial sector to the real economy. In this context, assessing the impact of supervision on the viability of the banking sector is of strategic importance. Thus, the author of the thesis set out to develop and calculate a composite indicator of banking viability and use it as an analytical tool to enable an objective assessment of the viability of the banking sector and analyze the efficiency of supervision from an opportunity cost perspective.

Therefore, the research carried out on the topic „Identifying the criteria of efficient supervision to maintain the viability of the banking system" is timely and essential for strengthening the capacity of the domestic banking system to cope with external shocks and support sustainable economic development, to strengthen public confidence in the banking system, and to improve the role of financial inclusion and financial intermediation in the economy.

The topic of the doctoral thesis is in line with the research directions promoted at European and international level, reflecting current concerns regarding the strengthening of financial stability and viability, the optimization of the banking regulatory and supervisory framework, and the definition of criteria for assessing the effeciency of supervisory activities. At the same time, the thesis contributes to the development of an analytical framework adapted to the specificities of the national banking system, by integrating the particularities of emerging economies and the characteristics of the banking system in the Republic of Moldova.

The description of the situation in the research field and the identification of associated problems. The thesis topic addresses four research elements: banking supervision, supervisory efficiency, banking viability, and the link between supervision and viability.

Academic literature approaches banking supervision mainly from the perspective of banking regulations, often treating it as a derivative component thereof. However, the financial crises of the 21st century have shown that supervision goes beyond the strict framework of regulatory compliance, becoming a separate discipline with its own objectives, instruments, resources, costs, and evaluation methods.

The efficiency of banking supervision is a research topic that is less frequently addressed as a distinct theme, being treated rather from the perspective of its effects on bank performance or from the perspective of prudential compliance and individual risk prevention.

In the national literature, studies on the efficiency of banking supervision are virtually non-existent. The National Bank of Moldova (NBM) does not provide a clear picture of the extent of its supervisory efforts, such as the number of employees involved in supervisory activities, supervisory hours, the number of on-site inspections, or the intensity of supervision of systemically important banks. Thus, the academic world does not have a reliable source of data to assess the efficiency of banking supervision. Given the lack of access to data on the direct costs

of supervision, the author of the thesis assessed the efficiency of banking supervision in terms of the opportunity costs generated by high levels of capital and liquidity.

The cost-benefit analysis becomes all the more important in the context where Basel III requirements have been applied at the local level without adapting them to the particularities of the banking market in the Republic of Moldova or without a detailed public analysis of the appropriateness and impact of the measures adopted. In the absence of calibration, there is a risk that compliance pressures will generate significant opportunity costs. At the same time, once the NBM became the supervisory authority for the non-banking sector, prioritizing supervisory efforts became even more difficult, requiring optimal allocation of limited resources.

Bank viability is a relatively new concept in banking research, being correlated with financial sustainability and resilience to external shocks. Although it appears in documents from the European Central Bank (ECB), the International Monetary Fund (IMF), and the World Bank, the literature treats the term in a fragmented manner. At the national level, the term banking viability is addressed in the context of the Supervisory Review and Evaluation Process (SREP), implemented by the NBM since 2019 as part of the reform of the domestic banking supervision framework. This tool is used by all supervisory authorities in European Union countries and establishes risk-based and forward-looking supervision, enabling early identification of deficiencies and risks and contributing to the efficiency of supervision, the assessment of business model viability, and the maintenance of banking sector stability. (ECB, 2017) At the same time, SREP addresses bank viability in a more limited manner, focusing on the individual assessment of banks and the analysis of the sustainability of the business model.

The interaction between supervision and banking system viability remains an emerging area of research, being addressed mainly in applied studies or stress tests conducted by central banks. There is still a scientific gap in modeling the causal relationship between supervisory efficiency and banking system viability, especially in emerging economies such as the Republic of Moldova.

The study degree of the research topic. Banking supervision has been defined and analyzed by international institutions such as the IMF, the Bank for International Settlements (BIS), the European Court of Auditors (ECA), the ECB, and the Basel Committee on Banking Supervision (BCBS) – along with numerous renowned researchers from different periods, who have contributed to shaping the definition of banking supervision in the literature, proposing various definitions and interpretations of the concept of banking supervision. Researchers such as Charles Albert Eric Goodhart (2000, 2004, 2010), James R. Barth, Gerard Caprio, Ross Levine (2006), Xavier Freixas and Jean-Charles Rochet (2008), Adrian Cosmescu (2015), Mihail Gîrlea (2016), Frederic S. Mishkin (2016), Anthony Saunders and Marcia Millon Cornett (2018) have reflected on the complexity and multidimensionality of banking supervision, approached from legal, economic, and institutional perspectives, and have highlighted the transformations that this field has undergone, depending on the historical context and the evolution of international financial markets.

The efficiency of banking supervision has been studied by the group of authors Cezar Basno, Nicolae Dardac, and Constantin Floricel (2003), Robert D. Behn (2003), Patricia J. Rogers and Carol H. Weiss (2007), Malcolm K. Sparrow (2008), Jeroen Klomp (2011), Yadav Gopalan and João Granja (2023), and Pereiro Pedro (2023), who proposed criteria and indicators for measuring the effects of supervision and highlighted the difficulties of directly quantifying its efficiency. At the same time, the CBSB formulated 29 principles of effective banking supervision and set out several preconditions for ensuring the effectiveness of banking supervision, which largely relate to macroeconomic policies and market discipline or, in other words, conditions that are not under the control of supervisory authorities. (CBSB, 2024)

The concept of bank viability has been analyzed in the literature mainly at the level of individual credit institutions, through the lens of performance and capitalization indicators, correlated with governance and business model, risk exposure, or macroeconomic factors. (Satish , Gopalakrishna, 1997; Gup, 2010; Makkar, Singh, 2015) The most recent research on bank viability has focused on the bankrupties of Silicon Valley Bank and First Republic—two US banks with different business models. Their bankrupties highlighted the vulnerabilities of

institutions that appeared solid from the perspective of traditional capital and liquidity indicators. Analyses by Amit Krishnamurthy (2024), Ali Al-Sari (2025), Steven Kelly and Jonathan Rose (2025) show that bank viability can no longer be analyzed exclusively in terms of capitalization and liquidity, but must be assessed in a multidimensional manner that integrates the analysis of business models, governance, and emerging risks, as well as the ability of institutions to withstand shocks triggered by developments in the financial environment and technology.

The interaction between supervision and bank viability is addressed by the BIS and the ECB, which integrate supervisory efficiency indicators into their bank stability assessment models. Goodhart highlighted the essential role of supervision in ensuring bank viability by regulating capital adequacy and effective risk management practices, as well as adapting to a globalized and constantly changing financial environment (Goodhart, 2000). Authors Freixas and Rochet (2008) and Herring and Carmassi (2008) emphasize that bank viability is determined by a combination of microeconomic factors, such as risk policy and individual financial indicators, and macroeconomic factors, such as systemic risk or economic shocks. Thus, banking supervision must be analyzed from both a microprudential and a macroprudential perspective in order to be efficient in maintaining the viability of the banking system as a whole. Recent research adds new dimensions. Pereiro Pedro (2023) highlights the role of resolution and the mandate of the supervisory authority, Yadav Gopalan and João Granja (2023) draw attention to the impact of interest rate risk on stability, and the CBCS emphasizes the need for proactive and integrated supervision capable of responding to the challenges posed by digitalization, globalization, and new types of economic shocks.

The purpose of the research is to identify the mechanism of interaction between banking supervision and the viability of the banking system, as well as to determine the optimal level of efficiency associated with this interaction, by defining the criteria and indicators for assessing the efficiency of banking supervision.

The objectives of the research are:

- to analyze the definitions of the term "banking supervision" found in the literature and in normative acts and to synthesize our own definition, recommended as a scientific concept;

- to identify criteria for assessing the efficiency of banking supervision from a theoretical perspective and to identify quantifiable, accessible, and relevant indicators for empirical analysis;

- conceptual analysis of the term "viability" in the literature and adaptation of its meaning to the specifics of banking activity;

- studying the Basel III international regulatory framework and detailed analysis of the new banking law in the Republic of Moldova;

- development and calculation of a composite indicator of banking viability;

- the inclusion of efficiency criteria as an element for adjusting the composite indicator of banking viability, intended to correct the distorting effect of excess liquidity and capital on the real assessment of the viability of the banking system;

- interpretation of research results from the perspective of banking supervision efficiency and formulation of recommendations.

Research hypothesis. Identifying the criteria for the efficiency of banking supervision is an essential step in establishing a model for assessing the viability of the banking system. Thus, the author argues that the level of viability of the banking system depends directly on the efficiency with which the supervisor exercises its powers, and the relationship between viability, supervision, and efficiency requires a multi-criteria approach that integrates dimensions such as governance, risk management, and resilience to macroeconomic factors, going beyond mere compliance with regulated prudential indicators.

Scientific research methodology. The research topic was studied using the following scientific research methods: economic and financial analysis (dynamic and structural analysis), induction and deduction, comparison,

analogy and synthesis, econometric models (linear regression, polynomial regression, p-value), statistical methods (correlation, dispersion, scoring, performance intervals, normalization).

As part of this research, the author developed a composite indicator of bank viability. This indicator was calculated in several stages. In the first stage, all financial indicators identified as influencing factors, including liquidity and capital, were integrated into the formula using a *standardized monotonic scoring method*. In the second stage, to reflect the opportunity costs associated with excessive levels of liquidity and capital, *non-monotonic scoring* was applied so that, when an optimal threshold was exceeded, the scores for these indicators decreased. To find the optimal liquidity and capital thresholds, *second-degree polynomial regressions* were used. In the third stage, the composite indicator, already adjusted to optimal liquidity and capital levels, was recalibrated by taking into account the influence of macroeconomic variables. A regression was performed between the composite bank viability indicator (adjusted) and the normalized values of the macroeconomic indicators, and P-values were found to determine how significant the relationship is and what weights of importance should be assigned to the macroeconomic indicators.

Scientific novelty. In this doctoral thesis, the following results of scientific novelty were obtained:

- A conceptual distinction was made between the notions of banking regulation and supervision, and a proposal for conceptualizing banking supervision was developed following an analysis of current sources in the specialized literature.

- Formulation of a set of quantifiable criteria and indicators for assessing the efficiency of banking supervision by delimiting the benefits and costs associated with the supervisory process, with a view to developing an analytical approach to overregulation.

- Adapting theoretical concepts of viability to the specifics of banking activity, as well as defining the concepts of bank viability, system viability, and banking system stability.

- Conducting an in-depth comparative analysis between the requirements of the Basel III Agreement and the national banking regulatory framework, highlighting the points of convergence and dysfunctions that require adjustments for effective adaptation to the realities of the banking market in the Republic of Moldova.

- Proposing efficiency criteria for adjusting excessive levels of capitalization and liquidity, reflecting the opportunity costs associated with these surpluses and providing a more realistic picture of the viability of the banking system.

- Identifying limitations and shortcomings in traditional methods of assessing supervisory efficiency, providing a conceptual and practical basis for developing further research directions in the field of regulatory and supervisory policies.

Expected results. This research aims to achieve the following scientific and practical results:

- Conceptual clarification of banking supervision through a comparative analysis of definitions in the literature, following which a definition of our own was systematized.

- Identification of the criteria for the efficiency of banking supervision by delimiting the cost and benefit components associated with the supervision process and selecting a set of quantifiable and relevant indicators.

- Adaptation of the concept of viability to banking activity through an in-depth theoretical analysis of its use in economic literature and in the context of content published by international financial organizations.

- Correlating the Basel III requirements with the provisions of the new regulatory and supervisory framework in the Republic of Moldova, in order to identify elements of compliance and differences that require adjustment or calibration.

- Developing a model for calculating and analyzing a composite indicator of banking viability, based on the aggregation of several financial and prudential indicators, as well as indicators that quantify management efficiency and shareholder quality as qualitative aspects.

- Reflecting the opportunity costs associated with overcapitalization and excess liquidity by calculating an optimal level, adjusting scores, and recalculating the composite bank viability indicator.

- Interpretation of the results obtained and identification of the implications for banking supervision, with the formulation of conclusions and recommendations.

The theoretical value of the paper lies in the following:

- Theoretical foundation of the concept of bank viability – the thesis contributes to the theoretical development of the concept of "viability" in the banking context by correlating it with banking supervision.

- Integration of inter- and transdisciplinary approaches – the thesis combines theories and models from microeconomics, macroeconomics, finance, statistics, econometrics, as well as from interdisciplinary fields such as banking regulation, banking supervision, corporate governance, and risk management.

- Development of a model for calculating a composite indicator of bank viability – the thesis brings a novel aspect by calculating a composite indicator based on non-scoring methods.

- Identifying gaps in the literature – the thesis identifies the limitations of current methods for assessing the efficiency of supervision and provides a basis for future research.

- Delimitation of the concepts of regulation and supervision, as well as regulatory requirements for the efficiency of supervision. The most essential Basel III requirements were analyzed, identifying their benefits, but also the need to calibrate them according to the specifics of the national economy.

The practical value of the paper lies in the following:

- Creation of a tool for assessing bank viability – the proposed composite indicator can be used in practice by supervisory authorities, central banks, or financial analysts for assessment and decision-making purposes, but also adapted for early risk diagnosis.

- Adaptability to the context of the Republic of Moldova – the analytical content is based on statistical data from the Republic of Moldova, which allows for the formulation of recommendations tailored to the domestic banking sector.

- Correlation of viability with macroeconomic indicators – integrating the influence of macroeconomic indicators into the viability calculation model provides not only a systemic perspective, but also a macroeconomic one.

- Assessment of supervisory efficiency through opportunity costs – adjusting the bank viability indicator for liquidity and capital levels that exceed the calculated optimal level is a real dimension of bank viability and, at the same time, a dimension of the opportunity costs arising from banking supervision.

- Basis for the development of new visions, oriented towards the development of a proactive and calibrated regulatory and supervisory framework.

- Academic and professional training tool – the analytical content and summaries of theoretical concepts can be integrated into courses, seminars, textbooks, research, and a starting point for initiatives to review the regulatory and supervisory framework.

Approval of results. The research results were appreciated through their scientific and professional use. The theoretical and analytical aspects, as well as the conclusions and recommendations formulated in the thesis, were reflected in nine scientific articles published in national and international journals and presented at several scientific events, thus contributing to the academic and practical validation of the scientific approach undertaken. The research results were appreciated by the Director of the Independent Analytical Center Expert-Grup, the Director of the Association of Banks of Moldova, and the former First Deputy Governor of the National Bank of Moldova. Their appreciation is confirmed by the implementation certificates attached to the thesis.

Thesis structure. The thesis includes: annotation, introduction, general conclusions and recommendations, bibliography of 139 titles, 18 appendices, 139 pages of main text, 29 figures, and 42 tables.

Keywords: banking supervision, bank viability, liquidity, capital, Basel III, compliance, banking regulation, supervisory efficiency, cost-benefit analysis, supervisory fees, overregulation, opportunity costs, viability indicator, banking stability.
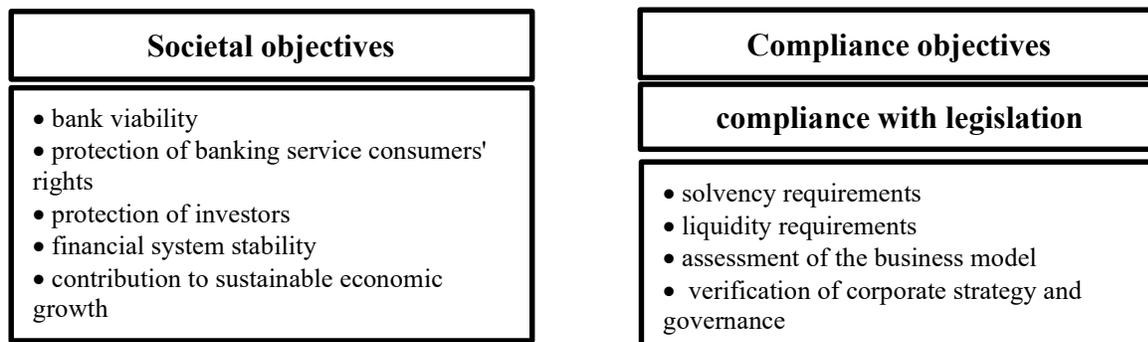
CONTENTS OF THE THESIS

The Introduction outlines the purpose and objectives of the doctoral thesis, the extent to which it has been studied in the specialist literature, and the relevance of the research topic. It also lists the research methods used, the information base, and the planned results.

Chapter 1 „Theoretical foundations of banking supervision and banking system viability" provides a synthesis of theories on banking supervision, banking viability, and the efficiency of banking supervision. It analyzes the evolution of the international regulatory framework, from Basel I to Basel III, to highlight major changes in supervisory approaches. In this context, the chapter emphasizes the importance of efficiency criteria, correlated with supervisory objectives, and identifies calculation indicators that allow the evaluation of supervisory intervention results. The chapter also includes an analysis of supervisory financing practices in the context of a financial system characterized by diversification, digitalization, and a high degree of uncertainty, which calls for the use of modern technologies, staff skills development, and efficient resource management.

Although banking regulations largely form the basis for banking supervision, the latter should be viewed as a science that needs to be defined and analyzed in terms of various criteria, such as objectives, types of institutionalization, instruments, financing mechanisms, criteria, principles, and preconditions for ensuring effectiveness, as well as methods for measuring efficiency and the macroeconomic impact.

Taking into account the micro and macro dimensions of banking supervision, two categories of banking supervision objectives can be formulated – one relates to compliance with legislation (quantitative and qualitative indicators), the other relates to the achievement of societal objectives.

Societal objectives	Compliance objectives
	compliance with legislation
• bank viability • protection of banking service consumers' rights • protection of investors • financial system stability • contribution to sustainable economic growth	• solvency requirements • liquidity requirements • assessment of the business model • verification of corporate strategy and governance

Figure 1.1. Objectives of banking supervision
Source: created by the author based on the source (Hilbers et al, 2013)

In an ever-changing world, banks are required to adapt their activities to align not only with financial regulations but also with broader societal objectives. These objectives include, among others, bank viability, social responsibility, consumer protection, and economic growth. By complying with compliance rules, banks indirectly contribute to the achievement of these societal objectives.

As a summary of all the definitions and visions listed above, the author proposes the following definition of banking supervision, relevant to the research topic of this doctoral thesis: *Banking supervision is an activity that is the responsibility of a supervisory authority and involves a continuous process of monitoring banks and the banking system as a whole for compliance, efficient risk management, and the orientation of banking activities towards achieving macroeconomic and social objectives.*

In recent years, supervisory tools have diversified to respond to the challenges posed by financial innovation and globalization, with an emphasis on early detection of problems, risk anticipation, and crisis prevention through tools such as stress tests and early warning systems. A central role is played by the SREP, introduced in 2004 with Basel II, which aims to consistently assess risk profiles and inform supervisory measures. (ECB, n.d.)
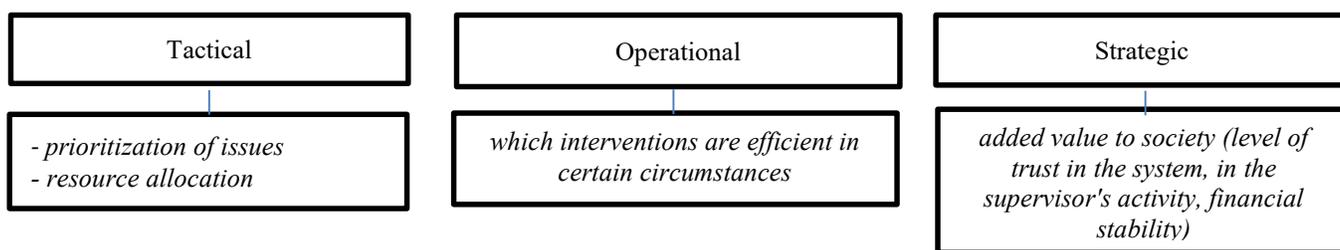
The evolution of the regulatory framework from Basel I to Basel III and the diversification of supervisory tools reflect a profound change in supervisory approaches. Thus, four types of transitions have been noted the shift from micro- to macroeconomic supervisory objectives, from compliance to risk-based supervision, from the assessment of quantitative indicators to the assessment of qualitative indicators as well, and from an identical approach to all banking institutions to specific supervisory approaches based on risk profile and systemic importance. (Figure 1.2.)

Basel I ⟶ Basel III

Micro → Macro	*Compliance → Risk*	*Quantitative → Qualitative*	*Identical approaches → Approaches based on risk profile*

Figure 1.2. Evolution of supervisory approaches from Basel I to Basel III
Source: created by the author

Measuring the efficiency of banking supervision is essential to assess the cost-benefit ratio and avoid the solution becoming more costly than market failure. The main goal is to provide clear information on performance (Behn, 2003) to guide authorities in choosing the appropriate level of intervention—strategic, tactical, or operational.

Tactical	Operational	Strategic
- prioritization of issues - resource allocation	*which interventions are efficient in certain circumstances*	*added value to society (level of trust in the system, in the supervisor's activity, financial stability)*

Figure 1.3. Lines of action and intervention by the supervisory authority
Source: created by the author based on the source (Hilbers et al, 2013)

Financial supervisors must be able to demonstrate the efficiency of their actions. In practice, however, the efficiency of banking supervision is difficult to quantify. According to Hilbers (2013), the most important difficulties in measuring the effects of financial supervision are causality, timing, confidentiality, and capacity. In a speech in 2024, the Chair of the ECB Supervisory Board, Claudia Buch, highlighted the difficulties in assessing the efficiency of supervision outlined by Hilbers (2013) and emphasized the importance of a robust data-based infrastructure, including through the use of SupTech technologies (Buch, 2024). Based on institutional and academic sources, Dermengi Daniela (2025b) shows that a modern supervisory model requires investment in strengthening institutional capacity through human capital development, digital infrastructure modernization, and the application of advanced analytical tools. Thus, supervisory efficiency is not only a methodological issue, but also a question of resources.

Following the financial crises of the 21st century, many countries have begun to finance their supervision through fees levied on supervised institutions, and the literature increasingly emphasizes the importance of supervision financing mechanisms to ensure its efficiency. At the same time, it is important to determine the relevance of such a mechanism based on certain structural factors. In countries where the supervisory authority is the central bank, supervision is usually financed from public funds, and independent authorities tend to rely on fees levied on supervised banks. Public funding also predominates in financial systems where banks are the main financial intermediaries, while in countries where capital markets are developed and companies are mainly financed through the issuance of shares and bonds, rather than bank loans, supervisory fees are more widespread. (Berger, Humphrey, 2010) In essence, the financing of supervision is an essential condition for the supervisory authority to be proactive and for supervision to be efficient. Without sufficient resources and a sustainable financing mechanism, even the best-designed supervisory frameworks can become inefficient (Dermengi, 2025b).

The efficiency of banking supervision is based on three conceptual levels: preconditions, principles, and efficiency criteria, determined by the existence and consistent application of the first two.

Preconditions refer to the institutional and macroeconomic foundations that provide a favorable framework for effective supervision. These include sustainable macroeconomic policies, well-formulated financial stability policy, well-developed public infrastructure, a clear framework for crisis management, resolution, and recovery, an adequate level of systemic protection, and market discipline. (BIS, 2024)

Table 1.1. Principles of effectiveness and criteria for efficient banking supervision

Principles of effectiveness	Efficiency criteria
Clear responsibilities and objectives	• clarity and predictability in the application of supervision; • responsible authorities; • efficient corrective measures.
Independence, resources, and legal protection	• ability to make objective decisions; • efficient allocation of resources; • proper implementation of measures.
Cooperation and collaboration	• efficient coordination between authorities; • prompt and complete exchange of information.
Licensing and permitted activities	• correct application of licensing criteria; • adequate control of banks' activities.
Risk-based supervisory approach	• proportionate monitoring of risks; • rapid intervention; • cost-efficient supervision.
Corporate governance and risk management	• Establishment of a robust governance framework; • efficient risk management; • maintaining the viability of banks.
Specific risk management	• reducing systemic risk; • preventing losses; • compliance with prudential requirements.

Source: created by the author based on the source (CBSB, 2024)

The **principles** of **effective** banking supervision establish the regulatory and supervisory framework and define the operational elements of supervisory activity. CBSB (2024) has formulated 29 principles of effective banking supervision. The first 13 principles and responsibilities focus on the powers, responsibilities, and functions of supervisory authorities, while principles 14-29 refer to the prudential regulations and requirements imposed on banks. (Dermengi, 2019) The application of these principles and compliance with the preconditions lead to tangible results, among which maintaining banking viability emerges as a fundamental objective of supervision.

The **criteria** for **efficient** banking supervision derive directly from the principles set by CSBS and Basel III, which promote risk-based supervision, institutional independence, transparency, and proportionality in the application of measures. The relevant principles and criteria for efficiency have been summarized in Table 1.1.

The criteria define what the supervisory authority aims to achieve through its work. Thus, the efficiency criteria can be grouped according to the objectives pursued into:

• **compliance criteria**, which reflect the extent to which international regulations and standards are being followed;

• **operational performance criteria**, which focus on the efficient use of the supervisory authority's human, financial, and informational resources;

• **impact criteria**, which assess the effects of supervision on the stability and viability of the banking system;

• **adaptability and resilience criteria**, which express the supervisory authority's ability to respond to changes in the financial environment and prevent systemic risks;

- **opportunity criteria**, aimed at identifying an optimal balance between prudence and bank performance. This criterion reflects the supervisory authority's ability to make decisions that are not only compliant with regulations and prudent from a risk perspective, but also conducive to sustainable and efficient banking.

The literature does not provide a clear and generally accepted definition of the concept of banking viability. All the definitions set out in the thesis can be divided into three main groups of approaches:

1. Viability is seen as a balance between performance and risk
2. Viability is associated with liquidity and solvency
3. Viability is about the efficient use and distribution of financial resources.

Based on the above definitions, the author developed the key terms from these theoretical approaches— liquidity, solvency, profitability, return, and capital – to identify the calculation indicators.

Table 1.2. Conceptual differences between viability, capitalization, profitability and liquidity

Concept	Definition	Indicators
Viability	• Analysis of the business model as a whole • The bank's ability to generate revenues greater than expenses in **the long term**	• Capital, liquidity, and profitability indicators in the long term • Risk profile • Internal governance, management framework • Specific approaches to risk exposure and systemic importance
Capitalization	• Sufficiency of capital to cover different types of risks	Minimum capital requirements Capital adequacy
Liquidity	• Ability to quickly convert assets into cash	Current liquidity Long-term liquidity Maturity band liquidity
Profitability	• The bank's ability to generate income greater than expenses in **the short term**	Net profit ROA ROE

Source: created by the author based on the source (Murray, 2020)

Goodhart (2000) emphasizes the role of supervision in ensuring viability through capital regulation and risk management, while Freixas and Rochet (2008) highlight the influence of micro- and macroeconomic factors. Recent studies (Pedro, 2023) confirm this approach, highlighting the importance of resolution activities and the mandate of the supervisory authority, while the failures of Silicon Valley Bank and First Republic have shown, according to Krishnamurthy and DeMarzo (2025), the need to differentiate between temporary liquidity problems and structural viability problems. The common conclusion of these studies is that the analysis of bank viability can no longer be limited to capital and liquidity, but must include the sustainability of business models, governance, and emerging risks, confirming the multidimensional nature of the concept and the need for proactive supervision. In this regard, a composite indicator of bank viability must integrate capital, liquidity, profitability, and other indicators of operational efficiency.

Chapter 2 „The evolution of the banking supervision framework and analysis of the performance of the banking system in the Republic of Moldova" summarizes the evolution of the supervisory and regulatory framework in the Republic of Moldova. It also analyzes prudential indicators in relation to regulatory requirements, as well as other indicators considered relevant from the perspective of banking viability. In order to highlight the institutional competence and techniques applied by the supervisory authority, a retrospective analysis of bank failures was also carried out, focusing on the intervention of the National Bank of Moldova and the timing of these interventions.

Since Moldova gained independence, the domestic banking system has developed rapidly against the backdrop of the transition to a market economy, inflationary pressures, macroeconomic instability, and the shocks generated by international financial crises. From banking legislation copied from other countries, which did not correspond to the specifics and needs of the market, the Republic of Moldova has gradually moved towards

legislation that is more effective in managing systemic problems and appropriate to the country's socio-economic development needs. With regard to the regulatory and supervisory framework for the banking sector, its evolution can be divided into four periods:

- **1995-1998 – copied legislation that did not correspond to the needs and specifics of the market**

During this period, the regulatory framework was built on the basis of external models, without adequate adaptation to the specifics and needs of the Moldovan market. The legislation at that time was rather copied from international regulatory models, without taking into account the local economic context. Thus, the legislation was not flexible enough to respond to rapid changes in the market. There was also a lack of a legislative framework adapted to the economic and financial realities of Moldova, and there were deficiencies in the supervision and regulation of financial institutions.

Prudential supervision was at an early stage, with minimal monitoring of liquidity and capitalization. Prudential supervision was not sufficiently developed to prevent instability in the banking system, and banks were not subject to clear and strict capital or risk requirements.

- **1998-2006 - consolidation and adaptation phase**

Reforms during this period included the implementation of clearer regulations tailored to market needs, the strengthening of the NBM's supervisory capacity, the improvement of capital requirements and the governance structure of banks, and the initiation of the process of adaptation to international regulatory standards.

Prudential supervision began to strengthen with the introduction of clear liquidity and solvency requirements, and banks were monitored more closely. The NBM began to play a more proactive role in monitoring banking stability, introducing prudential indicators such as the capitalization ratio and minimum liquidity requirements.

- **2006-2018 – capital and transparency issues**

During this stage, the focus was on issues related to banks' capital, but without a comprehensive approach to its origin and the transparency and integrity of shareholding. The banking system was marked by crises that highlighted gaps in the supervision and regulation of banks and underscored the importance of more rigorous supervision. At the national level, Basel I translated into the supervisory authority's concern about capital requirements, but the issue of its origin (shareholding) or adequacy by type of risk was not addressed. This legislative gap led to the following bank failures: InvestPrivatBank in 2009 and Universalbank in 2012.

With regard to **prudential requirements**, the NBM introduced more rigorous capital rules, but there was a lack of coordination between prudential supervision and the monitoring of risks associated with shareholding. Although banks met their capital requirements, the lack of efficient supervision of the shareholder structure allowed hidden risks to accumulate.

- **2018-present – Basel III regulations**

During this period, Moldova began to adopt and implement the Basel III regulations, which aim to improve financial stability and transparency in the banking sector. Basel III imposes stricter requirements on capital, liquidity, and risk management. Banks must therefore maintain higher core capital reserves to cover a wider range of risks. New short- and long-term liquidity regulations have been introduced to ensure that banks can cope with financial stress. Rules on risk management and reporting have been improved. Greater requirements have been imposed on financial reporting and shareholder transparency.

Prudential supervision has become more rigorous, with indicators such as liquidity, exposure to systemic risks, and high-quality capital being monitored. The NBM has begun to conduct stricter and more regular assessments to ensure compliance with requirements. In practical terms, this meant a process of re-regulation of the banking sector, moving from compliance-based supervision (Basel I) to risk-based supervision (Basel III). (Dermengi, 2019) The new banking law brought a broader vision of risk management by increasing capital requirements; regulating business ethics and remuneration mechanisms; introducing new regulations on affiliated

persons and administrators and new requirements in the process of changing shareholding; new staff competencies at the level of each licensed bank and new supervisory and control tools from the Central Bank. (Dermengi, 2018)

Until the law came into force, on July 1, 2017, the Regulation on the framework for managing the activity of banks (2017) was approved. According to the Regulation, each bank must have a rigorously designed management framework that includes a clear organizational structure with defined, transparent, and consistent lines of responsibility; efficient processes for identifying, managing, monitoring, and reporting risks; a process for assessing the adequacy of capital to risks (ICAAP); a process for assessing liquidity adequacy (ILAAP); adequate internal control mechanisms; regulation of business ethics and remuneration mechanisms.

It should be noted that in 2018, the NBM introduced *the first set of macroprudential instruments – capital buffers*. These are intended to increase the resilience of banks against potential losses resulting from the materialization of certain systemic risks. The NBM periodically reviews the established capital buffers and adjusts them as necessary. (Law on Banking Activity, 2017, Art. 63)

According to Law amending certain normative acts (2020), starting in July 2023, insurance and reinsurance companies, insurance and reinsurance intermediaries, the National Bureau of Motor Insurers of the Republic of Moldova, savings and loan associations, credit history bureaus, and non-bank lending organizations will be transferred from the management of the National Financial Market Commission to the NBM. (Dermengi, 2023) Thus, the NBM is the institution that combines monetary policy functions with regulation and supervision for both the banking sector and segments of the non-banking financial sector.
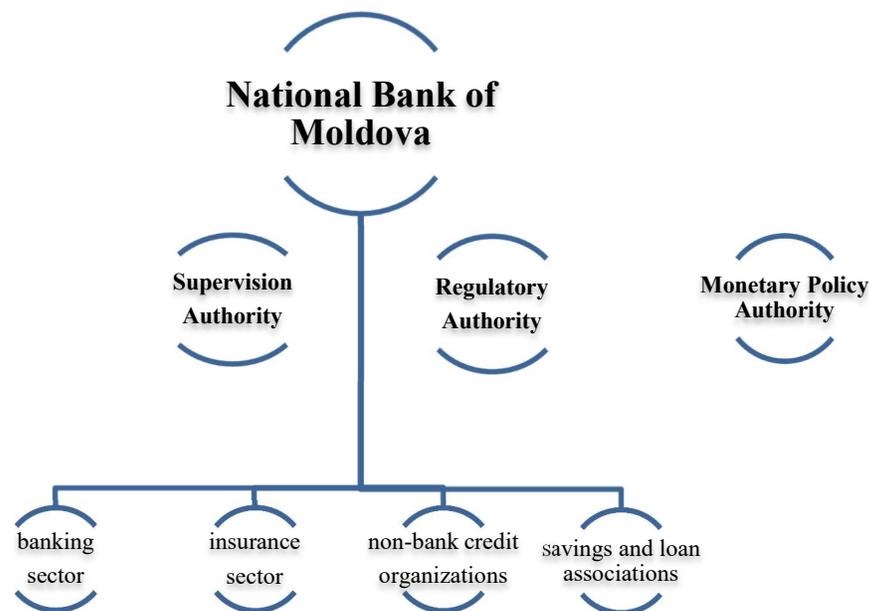
Figure 1.4. The role of the NBM as a supervisory and regulatory authority
Source: created by the author

Obviously, it is necessary to take into account the development prospects of the non-bank lending sector, but at the same time, it is necessary to accurately assess the additional efforts that the National Bank must make and the proper management of resources so that, ultimately, these new responsibilities do not affect the efficiency of banking supervision.

In a developing economy such as that of the Republic of Moldova, it is important to mobilize resources to support this development process. Given that the banking sector is considered „one of the most fragile elements of transition economies" this mobilization of resources can be achieved through the application of monetary policy

instruments, by ensuring price stability, but also, and not least, by ensuring an efficient banking supervision system. (Cobzari, Cucu, 2008)

Currently, the banking system in the Republic of Moldova is in a relatively comfortable position, complying with prudential requirements regarding capital adequacy and liquidity levels, as well as standards relating to the quality of shareholding and corporate governance. Profitability indicators are above the average recorded in European countries, reflecting the situation in many emerging countries where bank margins are high and financial intermediation is low. One concern remains the rate of non-performing loans, which, although it has improved significantly in recent years, remains above the EU average. (Dermengi, 2018)

The financial analysis of the banking system of the Republic of Moldova has highlighted four defining features, namely overcapitalization, excess liquidity, a high degree of concentration, and high profitability indicators in the context of low financial intermediation.

Table 1.3. Characteristics of the banking system and potential risks

Characteristics of the banking system	Potential risks
Overcapitalization	Opportunity costs, lost profits
Excess liquidity	Lost profits, reduced financial intermediation rate
High degree of concentration	Systemic risk
High profitability in conditions of low financial intermediation	Inefficient allocation of resources, limited ability of consumers to access financing, increased credit risk.

Source: created by the author

Basel III ensured legislative convergence and alignment of the national banking system with European best practices. The image of secure banks meant opportunities to attract investors. Basel III also introduced macroprudential supervisory tools, such as capital buffers, which have made banking supervision more proactive. Similarly, loopholes that had allowed fraud and led to bankruptcies in the past were closed by introducing requirements for corporate governance and shareholder transparency. On the other hand, the characteristics of the banking system have remained largely the same, with the implementation of Basel III regulations being seen in certain segments as over-regulation, especially from the perspective of the compliance costs incurred by small banks. At the same time, the author believes that it is precisely these characteristics of the banking sector that have helped it cope with the crises of the last decade, the pandemic period, and the strong inflationary pressures of recent years—events that did not depend directly on supervision and where the NBM was only able to react reactively and correctively.

The mix of characteristics of the national banking system shows, on the one hand, high efficiency in protecting the system, but, on the other hand, low efficiency in resource allocation. The supervisor's mission is to find an optimal point where stability does not inhibit intermediation and macroprudential policy stimulates sustainable credit growth.

In this vein, the author has developed an analytical model that integrates the factors and indicators used to calculate these factors in order to determine a system-wide bank viability indicator. The model introduces adjustments designed to reflect the opportunity costs generated by excess capital and liquidity. Thus, in Chapter 3, the author proposes a formula for calculating the viability indicator, using two scoring methods, in order to capture a more realistic picture of the viability of the banking system.

Chapter 3 „Assessing banking viability from the perspective of opportunity costs of supervision" presents an empirical exercise based on a dataset covering 14 banks over a 10-year period (2013-2024) and 18 indicators. The influencing factors and calculation indicators were identified, the degrees of importance were established, the performance ranges for each indicator were calculated, and the respective scores were assigned. The individual results were then weighted according to the systemic importance of each bank in order to obtain a system-level picture. In the first calculation phase, monotonic scoring was used for all indicators, including

liquidity and capital. In the second calculation phase, non-monotonic scoring was used to negatively adjust excess liquidity and overcapitalization. The impact on the composite bank viability indicator was shown. Subsequently, the adjusted indicator was recalibrated by integrating the evolution of macroeconomic indicators to reflect the real dimension of bank viability. (Dermengi, 2025a).

The calculation formula proposed by the author takes into account the factors, indicators, and weights of importance detailed in Table 1.4.

Table 1.4. Factors taken into account, indicators, and weightings

Factors	Indicators	Weight
Capital adequacy (C)	• Total equity ratio • Total liabilities/total capital	0.25
Liquidity (L)	• Liquidity principles I, II, and III • Liquidity coverage ratio	0.2
Credit portfolio quality (PC)	• Balance of non-performing loans (base amount) / Balance of loans (base amount) • Amount of reductions calculated for the balance of debt on loans (base amount) / Balance of debt on loans (base amount) • Amount of reductions for impairment losses on assets and contingent liabilities according to SIRF (million lei) / Total assets • Balance of debt on loans / Total assets (credit risk)	0.2
Management efficiency (ME)	• Non-interest expenses / Total income • Loan debt balance (base amount)/Deposit balance (base amount) • Return on equity (ROE) • Annualized interest income / Average monthly value of interest-bearing assets	0.15
Income quality (profitability) (P)	• Return on assets (ROA) • Interest income / Total assets • Net interest margin (NIM)	0.15
Shareholders (CA)	• Share of foreign capital, by country of origin rating	0.05
Sum of weights		1

Source: compiled by the author

The aggregate scores per system, for each sub-indicator, were calculated as the sum of the adjusted scores per bank for each sub-indicator.

$$S_{(j,t)}^{sistem} = \sum_{(i=1)}^{n} \cdot (s_{(ij,t)} \cdot \alpha_{(j,t)} \cdot \omega_{(i,t)}) \qquad (1)$$

where

- $s_{ij,t}$ – the bank's score i for the indicator j assigned according to performance intervals
- $\alpha_{j,t}$ – the weight of the indicator j in the aggregate viability indicator
- $\omega_{i,t}$ – the weight of the bank's assets i in total bank assets in the year t

Using equation (2), we calculated the aggregate bank viability index as the sum of the aggregate scores for each component factor:

$$IVB = S_{(C,t)}^{system} + S_{(PC,t)}^{system} + S_{(EM,t)}^{system} + S_{(P,t)}^{system} + S_{(L,t)}^{system} + S_{(CA,t)}^{system} \qquad (2)$$

Depending on the total score calculated, the banking system obtains a specific level of banking viability, which can be interpreted taking into account the performance ranges in Table 1.5.

Table 1.5. Interpretation of the overall bank viability score

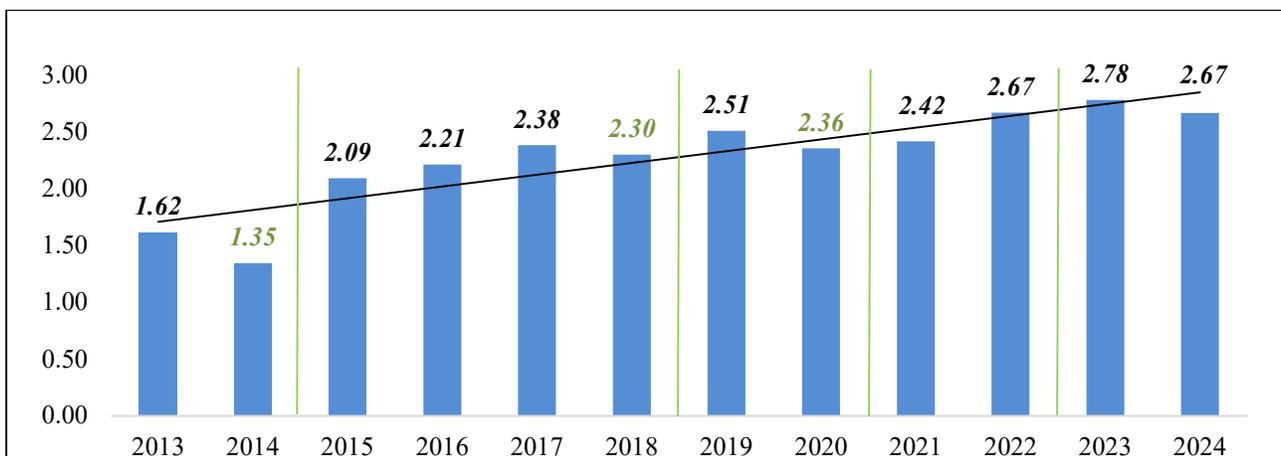| Overall score	Level of banking viability
≥3.2	High level of banking viability
2.6	Stable level of banking viability
2.1 – 2.6	Satisfactory level of bank viability
1.7 – 2.1	Low level of banking viability
≤1.7	Critical level of bank viability (non-viability)

Source: created by the author

The results obtained are presented in Table 1.6. and illustrated graphically in Figure 1.5. The evolution of the composite viability indicator over the period 2013-2024 allows us to observe general trends, as well as deviations associated with episodes of instability.

Table 1.6. Banking viability indicator for banks in the banking system

| Year	C	PC	EM	P	L	CA	VB (14 banks/ 11 banks)
2013	0.54	0.46	0.44	0.21	0.40	0.12	1.62/ 2.20
2014	0.38	0.40	0.27	0.26	0.32	0.12	1.35/ 1.77
2015	0.59	0.37	0.24	0.27	0.45	0.14	2.09
2016	0.68	0.25	0.31	0.29	0.52	0.13	2.21
2017	0.72	0.30	0.34	0.29	0.60	0.13	2.38
2018	0.63	0.38	0.34	0.27	0.52	0.13	2.30
2019	0.64	0.46	0.40	0.29	0.53	0.15	2.51
2020	0.65	0.56	0.17	0.24	0.56	0.15	2.36
2021	0.61	0.53	0.29	0.29	0.52	0.15	2.42
2022	0.68	0.49	0.42	0.40	0.53	0.15	2.67
2023	0.69	0.62	0.43	0.31	0.57	0.15	2.78
2024	0.61	0.71	0.37	0.30	0.54	0.15	2.67

Source: compiled by the author

In recent years, there has been a general trend towards improving viability, from a critical level in 2013-2014, driven by structural vulnerabilities and the near-failure of three banks, to satisfactory levels in subsequent years. Starting in 2022, the index rises to a stable level of banking viability.

Figure 1.5. Composite indicator of banking viability, 2013-2024
Source: created by the author

If the three problematic banks are excluded from the banking viability calculation formula, it can be seen that, for the period 2013–2014, the level of banking viability is much closer to the average recorded over the last

ten years. This adjustment confirms that the episodes of instability during that period were mainly generated by these banks, and their exclusion provides a more accurate picture of the overall trend in the banking system.
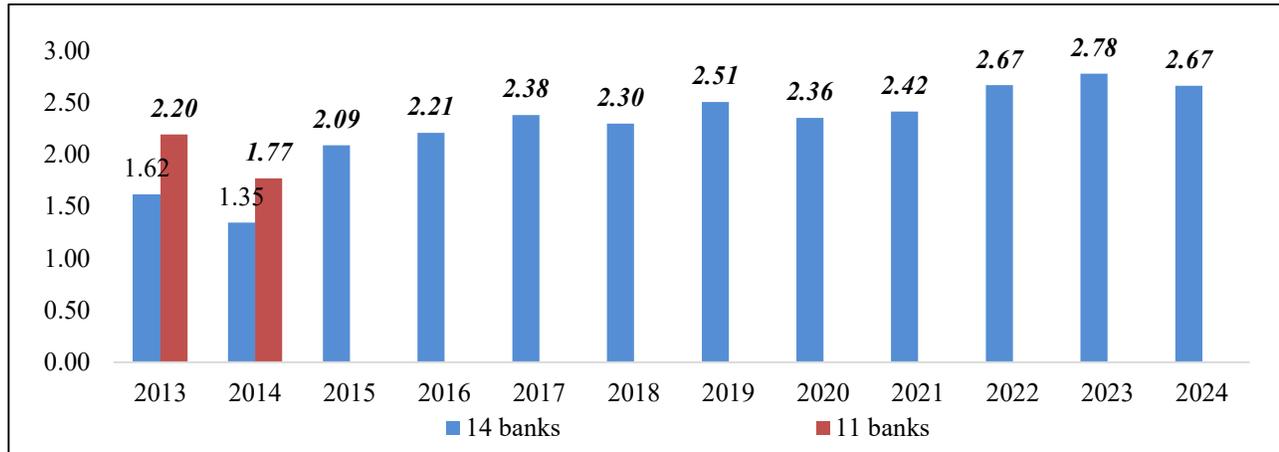
Figure 1.6. Composite indicator of bank viability, 2013–2024
(adjusted without Banca de Economii, Banca Socială, and Unibank)
Source: created by the author

Against the backdrop of the compliance changes brought about by Basel III, there was a decline in the composite bank viability indicator in 2018. This decline can be attributed to the need for banks to comply with the new prudential limits, which generated compliance costs, but also opportunity costs that made the domestic banking system even more overcapitalized, overliquid, and with a reduced financial intermediation rate.

A reduction in the bank viability indicator is also noticeable in 2020 – the pandemic year. Against the backdrop of declining economic activity, demand for loans fell substantially, as did the creditworthiness of customers with existing bank loans. As credit risks increased, banks became increasingly cautious and created larger reserves for loan losses, thereby affecting profitability. In the pandemic year of 2020, banks recorded a total profit of 1.5 billion lei, or about 760 million lei less than in 2019 (in percentage terms – an annual decrease of 33.6%).

These developments underscore the fact that simply accumulating capital and liquidity, while ensuring resilience in times of crisis, is not sufficient to guarantee long-term sustainable viability. For this reason, the analysis required an additional methodological adjustment to reflect the opportunity costs generated by overregulation. Thus, the author determined the optimal levels of liquidity and capital and adjusted the bank viability score using the non-monotonic scoring method.

Table 1.7. Calculation of the optimal level of liquidity indicators, by analysis sub-periods

| Liquidity indicators	Calculation sub-periods	Equation	Calculated optimal level
Principle I	*2016*	$y = -2.9855x^2 + 3.5748x - 0.0235$ $R^2 = 0.8301$	0.5987
	2022	$y = -9.6573x^2 + 6.0017x - 0.0478$ $R^2 = 0.9452$	0.3108
Principle II	*2016*	$y = 0.0008x2 + 0.0338x - 0.0157$ $R^2 = 0.8065$	21.125
Principle III	*2016*	$y = -0.0403x^2 + 0.2747x - 0.0314$ $R^2 = 0.4022$	3.41
LCR	*2022*	$y = -5*10^{-5} x^2 + 0.0152x - 0.0932$ $R^2 = 0.813$	152

Source: created by the author

In both cases, a second-degree polynomial regression was applied to capture both the initial positive effect of increased liquidity and capital on profitability and the inflection point at which the impact becomes negative. The optimal levels identified are presented separately in Tables 1.7. and 1.8., which summarize the equations obtained, the coefficients of determination (R²) and the values calculated for each sub-period.

Table 1.8. Calculation of the optimal level of capital indicators, by sub-periods of analysis

Capital indicators	Calculation sub-periods	Equation	Normalized optimal level	Denormalized optimal level
Capital adequacy	*2013-2017*	*-188.49x² + 100.96x - 13.07*	0.26	*34.5*
	2018-2024	*-2.6198x² + 1.7233x + 0.0076*	0.329	*20.89*
	2015-2024	*-3.221x² + 2.0861x - 0.039*	0.324	*25.35*
Debt/Capital	*2013-2024*	*7.8794x² - 7.1223x + 1.8572*	0.452	*3.85*

Source: calculations made by the author

If we adjust the IVB to both the optimal liquidity level and the optimal capital level, there is a significant decrease in the indicator values. Thus, in 2014, the adjusted IBV fell below the critical threshold of 1.7 (Figure 1.7.), and the maximum values, after adjustment, moved from the range corresponding to a stable level of bank viability to the category associated with a satisfactory level. The average adjusted bank viability score for the period 2013-2024 is 2.2, which means a low level of bank viability.
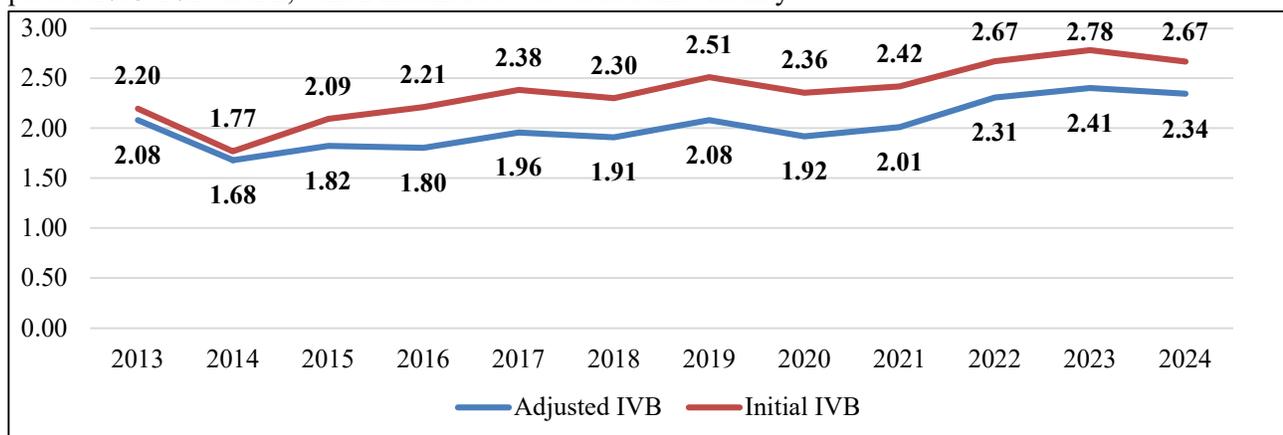
Figure 1.7. IVB, adjusted to the optimal level of liquidity and capital
Source: created by the author

The viability indicator calculated and adjusted to the optimal level of capital and liquidity is both a signal of banking health and a tool for assessing the efficiency of banking supervision. The negative adjustment for overcapitalization and excess liquidity is based on proactive supervision that is not limited to compliance. This approach provides an opportunity to identify situations where excessive prudence is no longer considered productive, generating opportunity costs that negatively affect banks' financial performance and their ability to finance the real economy.

At the same time, excess liquidity and high capital levels were key factors that helped the banking sector weather crises that compromised its viability, such as the 2007-2008 international financial crisis (impact felt locally in 2009), the currency crisis generated by the theft of the billion (2015), the COVID-19 pandemic (2020), the war in the neighboring country (2022-present), and inflationary pressures (2022-present).

Based on these findings, the author considered it appropriate to recalibrate the adjusted IVB in a more comprehensive manner to cover not only micro aspects related to the banking sector, but also macroeconomic variables that directly influence the banking sector, such as GDP, inflation rate, and exchange rate. In this context, an extended banking viability indicator was calculated.

$$IVB_t^{recal} = IVB_t^{adj} + \alpha1 * f(PIB_t^{real}) - \alpha2 * f(IPC_t) - \alpha3 * f(curs_t) \quad (3)$$

where:

IVB_t^{recal} – the recalibrated value of the bank viability indicator
IVB_t^{adj} – the adjusted value of the indicator at optimal capital and liquidity levels
$f(PIB_t^{real}), f(IPC_t)$ și $f(curs_t)$ – the normalized functions of macroeconomic variables
$\alpha 1 \alpha 2 \; \alpha 3$ – coefficients estimated by regression, expressing the relative weight of each macroeconomic variable in determining bank viability

To operationalize the extended bank viability indicator, data on macroeconomic indicators for the period 2013–2024 were collected and systematized, namely: real gross domestic product (real GDP), consumer price index (CPI), as well as the evolution of the Moldovan leu (MDL) exchange rate against the main reference currencies (USD and EUR).

Table 1.9. Macroeconomic indicators and IVB (adjusted)

	CPI	MDL/USD exchange rate	MDL/EUR exchange rate	Real GDP, thousand MDL	IVB (adjusted)
2013	104.6	12.5907	16.7241	96,521,372	2.20
2014	105.1	14.0388	18.6321	105,309,754	1.81
2015	109.7	18.8161	20.898	131,018,040	1.96
2016	106.4	19.9238	22.0548	153,484,960	1.93
2017	106.6	18.4902	20.8282	165,576,005	2.09
2018	103.1	16.8031	19.8442	183,200,220	2.04
2019	104.8	17.5751	19.6741	195,689,031	2.23
2020	103.8	17.3201	19.7436	189,141,746	2.07
2021	105.1	17.6816	20.9255	227,517,508	2.16
2022	128.7	18.9032	19.8982	230,856,235	2.46
2023	113.4	18.1607	19.6431	277,725,561	2.56
2024	104.7	17.7916	19.2529	303,768,128	2.49

Source: created by the author based on sources (NBM, n.a.-b) and (NSB, n.a.)

In order to assign weights of importance to macroeconomic variables, a linear regression was applied between the adjusted composite indicator of banking viability, as a dependent variable, and the normalized values of selected macroeconomic indicators, as explanatory variables.

The data series for real GDP, inflation rate, and MDL/USD and MDL/EUR exchange rates were normalized to eliminate scale differences and ensure comparability of results. The normalized values of macroeconomic indicators are presented in Table 1.10.

Table 1.10. Normalized values of macroeconomic indicators

	CPI	MDL/USDn	MDL/EURn	Real GDP n	IVB (adjusted)
2013	0.1	0.0	0.0	0.0	2.20
2014	0.1	0.2	0.4	0.0	1.81
2015	0.3	0.8	0.8	0.2	1.96
2016	0.1	1.0	1.0	0.3	1.93
2017	0.1	0.8	0.8	0.3	2.09
2018	0.0	0.6	0.6	0.4	2.04
2019	0.1	0.7	0.6	0.5	2.23
2020	0.0	0.6	0.6	0.4	2.07
2021	0.1	0.7	0.8	0.6	2.16
2022	1.0	0.9	0.6	0.6	2.46
2023	0.4	0.8	0.5	0.9	2.56
2024	0.1	0.7	0.5	1.0	2.49

Source: based on the author's calculations

Following the application of multiple linear regression in Excel, with the adjusted composite bank viability indicator (IVB_adj) as the dependent variable and the normalized macroeconomic indicators as independent variables, P-values were obtained. The latter reflect the level of statistical significance of each explanatory variable. The results are presented in Table 1.11.

Table 1.11. P-values for macroeconomic indicators

Macroeconomic indicators	P-values
IPCn	0.278844
MDL/USDn	0.155288
MDL/EURn	0.033437
Real GDP n	0.007054

Source: based on the author's calculations in Excel

According to the criterion of statistical significance, if the P-value is less than 0.05, it is interpreted that there is a statistically significant relationship, and if the P-value is greater than 0.05, there is a relationship with weak statistical significance. Thus, the results obtained indicate that real GDP (P=0.007) and the MDL/EUR exchange rate (P=0.033) are variables with a significant impact on bank viability, which is why they were each assigned a weight of 40% in the extended indicator.

Inflation (CPI), although statistically insignificant at the 5% level (P=0.279), was nevertheless retained in the model as a secondary variable, with a reduced weight of 20%. On the other hand, the MDL/USD exchange rate (P=0.155) was excluded from the calculation because it is not statistically significant.

Table 1.12. Macroeconomic factors taken into account and their weights

Indicator	Weight
GDP	0.4
Inflation	0.2
Exchange rate	0.4

Source: based on the author's calculations

Based on the determined weights, the final formula for calculating the extended bank viability indicator is as follows:

$$IVB_t^{recal} = IVB_t^{adj} + 0{,}4 * f\left(PIB_t^{real}\right) - 0{,}2 * f(IPC_t) - 0{,}4 * f(MDL/EUR_t) \tag{4}$$

The signs of the coefficients express the direction of the relationship: real GDP growth has a positive impact on bank viability, while inflation and the depreciation of the leu against the euro have a negative effect.

Based on formula (4), the annual bank viability indicator for the period 2013–2024 was recalculated. Table 1.13 and Figure 1.8 present the numerical values and graphical representation of the recalibrated IVB, respectively. They illustrate the dynamics of the indicator over the entire period analyzed and compare its evolution with the adjusted IVB in order to capture the differences generated by the inclusion of macroeconomic variables.

Table 1.13 . Weighted macroeconomic factors

Year	CPI (weighted)	MDL/EURn (weighted)	Real GDPn (weighted)
2013	0.0	0.0	0.0
2014	0.0	0.1	0.0
2015	0.1	0.3	0.1
2016	0.0	0.4	0.1
2017	0.0	0.3	0.1
2018	0.0	0.2	0.2
2019	0.0	0.2	0.2
2020	0.0	0.2	0.2
2021	0.0	0.3	0.3
2022	0.2	0.2	0.3
2023	0.1	0.2	0.3
2024	0.0	0.2	0.4

Source: based on the author's calculations
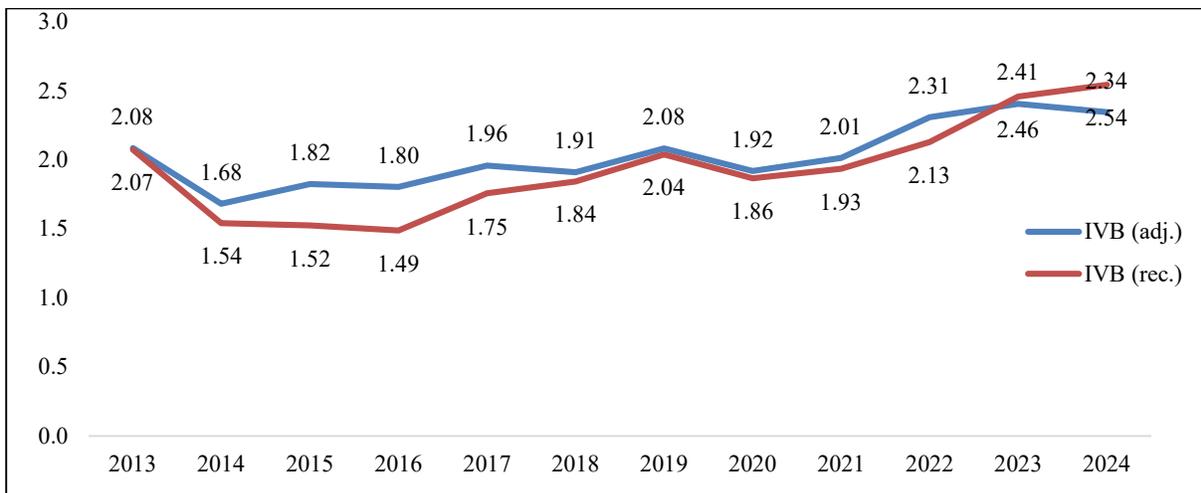
Figure 1.8. IVB, recalibrated after the impact of macroeconomic indicators
Source: created by the author

Figure 1.8. highlights the fact that, throughout the entire period under review, macroeconomic indicators acted as negative adjustment factors for bank viability, with the exception of 2024. The largest deviations can be seen in the period 2015–2017, when the significant depreciation of the Moldovan leu against the euro exerted major pressure on the stability of the banking sector. In 2022, the influence of inflationary factors was more pronounced than in other years, amplified by the secondary effects of the war in the neighboring country and the imbalances generated in the energy markets. In 2024, the impact of economic growth was strong enough to offset inflationary pressures, while the exchange rate had an insignificant influence, resulting in a positive contribution of the macroeconomic context to banking viability.

Most supervisory tools, including those applied by the NBM, aim to ensure compliance with regulated minimums. The banking viability model calculated by the author, adjusted and recalibrated, focuses on levels considered optimal, which means that it applies negative adjustments not only in the case of a deficit, but also in the case of an excess. It also differs in that it recalibrates the results obtained with the levels recorded by macroeconomic factors.

Table 1.14 summarizes a comparative analysis between the banking viability indicator developed by the author and supervisory tools such as SREP, CAMELS, early warning indicators, and stress tests.

Table 1.14. Comparative analysis between IVB and other banking supervision tools

Instrument	Common with IVB	Different from BVI
SREP	- aims to assess the health and risks of a bank - Holistic analysis of the bank, including capital and liquidity	- SREP is qualitative, with supervisory and managerial assessment components - IVB is a quantitative indicator adjusted for overcapitalization and excess liquidity, with qualitative elements assessed through quantitative indicators, macro-recalibrated
CAMELS	- both assess capital, assets, management, profits, liquidity	IVB adjusts liquidity and capital to optimal levels and introduces macroeconomic factors – something CAMELS does not do
Early warning indicators	- Both identify emerging risks over time	IVB tracks not only deterioration, but also inefficiencies hidden in seemingly good values.
Stress testing	- Both test the bank's resilience to financial shocks	- Stress tests simulate extreme scenarios and may be hypothetical - IVB produces a real score based on historical data and macro adjustments, which is more quantitative and comparative

Source: created by the author based on the source (Sahajwala, 2000)

Thus, IVB is a hybrid analytical tool, situated at the intersection between micro and macro-prudential indicators, between quantitative and qualitative assessment, with the ability to capture both emerging risks and inefficiencies hidden in seemingly favorable values.

IVB can be used by the supervisory authority not only to provide a synthetic measure of the viability of the banking system, but also as an operational tool to increase the efficiency of the supervisory process. By integrating IVB into existing methodologies, the authority can obtain a quick and aggregated picture of the health of the sector. In addition, IVB can function as a calibration or correction indicator for other assessment exercises, stress tests, or scoring models, thus contributing to the robustness of supervisory decisions.

The results of the calculation model cover periods of crisis, reform, and stabilization. Thus, the calculation model is considered a useful analysis and diagnostic tool for the supervisory authority. The NBM can develop a similar tool, based on much more detailed and complex data, to more effectively adapt its supervisory policies, actively respond to financial market risks and developments, maximize performance, and strengthen the resilience of the banking sector.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

The doctoral thesis demonstrated that banking supervision is an essential aspect of modern financial systems and is a key pillar for maintaining the viability of the banking system. The study sought to address a number of theoretical and empirical objectives, starting with the definition of the concepts of banking supervision, efficiency, and viability, continuing with the systematization of evaluation criteria and the identification of quantifiable indicators, and culminating in the development of an analytical model for measuring banking viability.

The thesis showed that regulation and supervision are interlinked processes, being instruments of the supervisory authority – both in terms of dictating rules and in terms of verifying how these rules are complied with and serve macroeconomic and social objectives. While regulation is based on clear rules and verifiable information, supervision is much more discretionary and can go beyond regulations, covering risks that the law has failed to regulate.

In the author's view, **banking supervision is an activity that is the responsibility of the supervisory authority and involves a continuous process of monitoring banks and the banking system as a whole for compliance, efficient risk management, and the orientation of banking activities towards achieving macroeconomic and social objectives.**

Banking supervision has evolved from a predominantly compliance-based approach to a risk-oriented one, integrating both microeconomic and macroeconomic dimensions. As banking services become more sophisticated, digitized, and internationalized, the risk environment has become more complex, and supervisory authorities need to continuously strengthen their institutional capacities through modern technologies, analytical tools, and human capital development. In this perspective, the efficiency of supervision is measured not only by compliance with the rules, but also by the ability to anticipate and prevent crises, maintain public confidence, and demonstrate performance through strategic, operational, and tactical indicators.

Thus, measuring the effects of supervision must become part of the supervisory process so that supervisory authorities can demonstrate that their efforts and actions are yielding results. Measuring the efficiency of banking supervision is important in order to determine whether the costs of supervisory resources outweigh the benefits and whether the solution to market failure is worse than the failure itself (supervisory failure). The performance of supervisory policy can be illustrated more convincingly by following the "multiple lines of evidence" argument and building a portfolio of performance indicators. In practice, the efficiency of banking supervision is difficult to quantify. Supervisors must in many cases accept a degree of uncertainty when examining the causal relationship between their activities/interventions and their impact.

The research findings confirm that **the efficiency of banking supervision** is not limited to ensuring institutions' compliance with prudential requirements, but **requires a complex approach that integrates efficiency criteria** such as: optimisation of institutional resources, cost-benefit analysis, assessment of lost opportunities generated by overcapitalization and excess liquidity, and calibration of interventions so as not to inhibit the financial intermediation function of banks.

In the context of the objective of conceptual analysis of the term "viability" and its adaptation to the banking sector, the thesis confirms that banking viability is both an objective and a result of efficient supervision, while also being a tool for assessing the efficiency of the supervisory authority. In the author's view, **banking viability represents a bank's ability to generate long-term financial performance, with a high-quality loan portfolio, optimal resource consumption, and an adequate governance framework, and, in times of crisis, to demonstrate its resilience through effective risk management practices.** This integrates micro and macro perspectives, allowing the supervisory authority to take a comprehensive approach, from the assessment of individual institutions to the analysis of the system as a whole.

A study of the Basel III international regulatory framework and an analysis of the Banking Law of the Republic of Moldova show that, against the backdrop of the crises of the 21st century, the international regulatory

and supervisory framework for the banking sector has been redesigned to strengthen the capacity to manage banking risks and financial crises. In this regard, Basel III introduced both microprudential instruments (targeting individual bank risks) and macroprudential instruments (for the stability of the banking system as a whole). Alignment with European Union regulatory requirements has led the banking system in the Republic of Moldova to adopt best practices in banking risk management and to move from compliance-based to risk-based supervision, ensuring convergence with EU directives on capital, liquidity, significant exposures, shareholder quality, money laundering, and corporate governance.

Past bank failures highlighted gaps in the previous regulatory and supervisory framework, but the adoption of Basel III standards and harmonization with European Union regulations have strengthened legislative convergence and the image of stability of the national banking sector. However, the persistence of **structural features such as overcapitalization, excess liquidity, and high concentration** calls for further assessment of the impact of these factors on the efficiency of supervision and the viability of the system.

The lack of an integrated indicator of banking viability limits the assessment of the sector, focusing excessively on compliance requirements and failing to reflect the efficiency of resource use or the system's ability to support the real economy. In this perspective, the scientific contribution of the study consists in developing a tool that addresses this issue, namely an **empirical model for measuring banking viability through a composite indicator** that integrates the microprudential and macroprudential dimensions and introduces adjustments for the opportunity costs associated with excess capital and liquidity. The application of the model shows that the optimal levels of liquidity and capital, calculated on the basis of regression equations, are well above the regulated minimums, confirming the existence of significant opportunity costs for their performance. This reality is determined, on the one hand, by regulatory pressures, but it also has other potential underlying causes, such as low demand for quality loans, low cost of liquidity and capital, and safety measures in conditions of economic and political uncertainty.

This model is a useful banking supervision tool, capable of capturing not only compliance with minimum standards, but also a more realistic picture of banks' ability to generate sustainable performance and contribute to the financing of the real economy.

The research highlighted the importance of ensuring a **sustainable mechanism for financing supervision** by introducing supervisory fees, a practice adopted in many European countries. Although the legal framework provides institutional autonomy to the National Bank of Moldova, supervision is financed from its internal resources, not through a dedicated financing mechanism. In this context, the introduction of supervisory fees ensures stability and predictability in terms of supervisory resources and allows for investments in digital infrastructure, human capital, and modern analytical tools – factors that are indispensable for efficient supervision in an increasingly complex and digitized financial environment.

By achieving the proposed objectives, the results of the thesis confirm that banking viability should be understood as a multidimensional concept, reflecting the ability of banks to generate sustainable financial performance, withstand external shocks, and adapt their business models in a dynamic and uncertain global context. At the same time, the efficiency of supervision depends on how authorities manage to calibrate prudential pressures, ensure transparency, and find an optimal balance between system stability and financial intermediation.

Based on the research results, the author has formulated *the* following *recommendations* for the supervisory authority:

- Integration of viability assessment and composite indicators into the decision-making process. It is recommended that the supervisory authority use a composite banking viability indicator (CBI) that combines quantitative and qualitative dimensions for early risk diagnosis and to support the authorities' strategic decisions. The CBI allows not only for the assessment of system stability, but also for the measurement of the efficiency of supervision in stimulating financial intermediation.

- Correlating viability with efficiency criteria. Adjusting indicators for overcapitalization and excess liquidity, identifying the associated opportunity costs, and assessing how they affect bank performance provides the supervisory authority with a tool for prioritizing resources and streamlining supervision.

- It is recommended that the National Bank balance capital and liquidity levels to ensure the resilience of the sector without inhibiting financial intermediation. It is also necessary to monitor the relationship between profitability and intermediation to avoid the accumulation of profits with no impact on the economy.

- Calibrating prudential requirements to the local context. Efficiency criteria should include not only compliance with Basel III standards, but also their adaptation to the structure and size of the domestic banking sector, so as to maintain resilience without reducing financial intermediation and economic performance.

- Improving transparency and communication. Regular publication of data on the controls carried out, the resources involved, and the costs associated with supervision allows for the assessment of its efficiency and increases market confidence in the banking system's ability to manage risks.

- Developing analytical and professional capacities. It is considered appropriate to create specialized teams capable of assessing the impact of regulations, compliance costs, and effects on the stability and performance of the banking sector, while encouraging collaboration with academia to create local models for assessing sectoral viability and efficiency.

- Using viability as a tool for proactive supervision. Indicators adjusted according to efficiency criteria can guide differentiated supervision policies, stimulating financial intermediation and maximizing economic performance, thereby simultaneously strengthening both the viability of banks and the efficiency of supervision.

Although the thesis has contributed to strengthening the theoretical and empirical framework for assessing the efficiency of supervision and the viability of the banking sector, there are several **research directions that can extend and deepen the results obtained**. First, the research could be extended to other emerging economies in order to make international comparisons and test the relevance of the indicator. This requires a structural review of the bank viability indicator, based on the characteristics of the banking systems under analysis.

Second, further research could focus on the use of alternative econometric methods, not only based on quantitative data, but also by integrating qualitative data, in order to capture dimensions of banking supervision that are more difficult to quantify. It is also considered appropriate to extend the analysis beyond historical data, through scenario studies and forecasting, to provide additional insight into the relationship between supervision and bank viability.

Third, future research could focus on a detailed analysis of the financial statements of the National Bank of Moldova and its expenditure structure, from a dynamic perspective, in order to assess more accurately the appropriateness of introducing a mechanism based on supervisory fees.

Another relevant direction would be to collect and analyze data that is not currently public, such as the NBM's supervisory costs. Integrating this information would allow for a direct assessment of the impact of supervision on bank viability and would strengthen the practical value of the research.

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ADNOTARE

Dermengi Daniela „Identificarea criteriilor de eficiență a supravegherii în vederea menținerii viabilității sistemului bancar", teză de doctor în științe economice, Chișinău, 2026.

Structura tezei: introducere, trei capitole, concluzii generale și recomandări, bibliografie din 139 titluri, 18 anexe, 139 de pagini text de bază (până la Bibliografie), 29 figuri și 42 tabele. Rezultatele obținute sunt publicate în 9 lucrări științifice.

Cuvinte-cheie: supraveghere bancară, viabilitate bancară, lichiditate, capital, Basel III, conformitate, reglementare bancară, eficiența supravegherii, analiza cost-beneficiu, taxe de supraveghere, suprareglementare, costuri de oportunitate, indicator de viabilitate, stabilitate bancară.

Domeniul de studiu: Științe economice.

Scopul cercetării constă în identificarea mecanismului de interacțiune dintre supravegherea bancară și viabilitatea sistemului bancar, precum și în determinarea nivelului optim de eficiență asociat acestei interacțiuni, prin definirea criteriilor și indicatorilor de evaluare a eficienței supravegherii bancare.

Obiectivele cercetării se rezumă la fundamentarea științifică a relației dintre eficiența supravegherii bancare și viabilitatea sistemului bancar. În acest scop, cercetarea urmărește: clarificarea conceptuală a termenilor „supraveghere bancară" și „viabilitate"; identificarea principiilor, precondițiilor și criteriilor de eficiență a supravegherii, precum și a indicatorilor de calcul; analiza cadrului normativ internațional și național; elaborarea unui indicator compozit de viabilitate bancară; integrarea unui mecanism de ajustare care să reflecte impactul supracapitalizării și supralichidității asupra viabilității sectorului bancar.

Noutatea și originalitatea științifică a lucrării rezidă în elaborarea modelului de calcul al indicatorului compozit de viabilitate bancară care integrează ajustări pentru supracapitalizare și supralichiditate. Aceste ajustări reflectă situațiile în care nivelurile excesive de capital și lichiditate devin surse de ineficiență și generează costuri de oportunitate pentru bănci și pentru economia reală.

Rezultatele obținute care contribuie la soluționarea problemei importante. Rezultatele cercetării contribuie la soluționarea problemei generate de lipsa unui mecanism integrat de evaluare a viabilității bancare și măsurare a eficienței supravegherii, adaptat Republicii Moldova. Cercetarea a dezvoltat un indicator compozit de viabilitate bancară, capabil să surprindă atât conformitatea prudențială, cât și efectele indirecte ale supracapitalizării și supralichidității. Acest instrument metodologic oferă Băncii Naționale a Moldovei un suport analitic suplimentar pentru fundamentarea deciziilor și pentru evaluarea impactului real al reglementărilor și intervențiilor sale.

Semnificația teoretică și valoarea aplicativă a lucrării. Contribuția teoretică rezidă în extinderea literaturii privind relația dintre supraveghere și viabilitate bancară, prin formularea unui cadru conceptual care integrează dimensiunea microprudențială cu cea macroprudențială și introduce ajustări pentru costurile de oportunitate. Valoarea aplicativă constă în elaborarea unui indicator compozit de viabilitate bancară, replicabil și adaptabil, ce poate servi instrument suplimentar de diagnostic în procesul decizional al autorităților de supraveghere și ca suport metodologic pentru cercetători și practicieni.

Implementarea rezultatelor științifice. Rezultatele cercetării au fost apreciate de către Directorul Centrului Analitic Independent Expert-Grup, Directorul Asociației Băncilor din Moldova și fostul prim-viceguvernator al Băncii Naționale a Moldovei. Aprecierea acestora este confirmată prin certificatele de implementare anexate la teză.

ANNOTATION

Dermengi Daniela „Identifying the criteria of efficient supervision to maintain the viability of the banking system", PhD thesis in economics, Chişinău, 2026.

Thesis structure: introduction, three chapters, general conclusions and recommendations, bibliography of 139 titles, 18 appendices, 139 pages of main text (up to the Bibliography), 29 figures and 42 tables. The obtained results were published in 9 scientific papers.

Keywords: banking supervision, bank viability, liquidity, capital, Basel III, compliance, banking regulation, supervisory efficiency, cost-benefit analysis, supervisory fees, overregulation, opportunity costs, viability indicator, banking stability.

Field of study: Economics

The purpose of the research is to identify the mechanism of interaction between banking supervision and the viability of banking system, as well as to determine the optimal level of efficiency associated with this interaction, by defining the criteria and indicators for assessing the efficiency of supervision.

The objectives of the research are to provide a scientific basis for the relationship between the efficiency of banking supervision and the viability of the banking system. To this end, the research aims to: clarify the concepts of „banking supervision" and „viability"; identify the principles, preconditions, and criteria of supervisory efficiency, as well as the relevant indicators for assessing the efficiency of supervision; analyze the international and national regulatory framework; develop a composite indicator of banking viability; integrate an adjustment mechanism that reflects the impact of overcapitalization and excess liquidity on the viability of the banking sector.

The scientific novelty and originality of the paper lies primarily in the development of a model for calculating the composite bank viability indicator, which integrates adjustments for overcapitalization and overliquidity. These adjustments reflect situations in which excessive levels of capital and liquidity become sources of inefficiency and generate opportunity costs for banks and for the real economy.

Results obtained that contribute to solving the important problem. The research addresses the absence of an integrated mechanism for assessing banking viability and measuring supervisory efficiency, adapted to the Republic of Moldova. It develops a composite indicator of banking viability, capable of capturing both prudential compliance and the indirect effects of overcapitalization and overliquidity. This methodological instrument provides the National Bank of Moldova with an additional analytical tool for decision-making and for evaluating the real impact of its regulations and interventions.

Theoretical significance and practical value of the paper. The theoretical contribution consists in extending the literature on the relationship between supervision and banking viability, through the formulation of a conceptual framework that integrates the microprudential and macroprudential dimensions and introduces adjustments for opportunity costs. The practical value lies in the development of a composite indicator of banking viability, replicable and adaptable, which can serve as an additional diagnostic tool in the decision-making process of supervisory authorities, as well as a methodological support for researchers and practitioners.

Implementation of scientific results. The results of the research have been endorsed by the Director of the Independent Analytical Center „Expert-Grup", the Director of the Moldovan Bankers' Association, and the former First Deputy Governor of the National Bank of Moldova. Their endorsement is confirmed through implementation certificates annexed to the thesis.

ПРИМЕЧАНИЕ

Дерменджи Даниела «Определение критериев эффективности надзора с целью поддержания жизнеспособности банковской системы», докторская диссертация по экономическим наукам, Кишинэу, 2026.

Структура диссертации: введение, три главы, общие выводы и рекомендации, библиография из 139 названий, 18 приложений, 139 страниц основного текста, 29 рисунков и 42 таблица. Полученные результаты опубликованы в 9 научных работах.

Ключевые слова: банковский надзор, банковская жизнеспособность, ликвидность, капитал, Базель III, банковское регулирование, эффективность надзора, анализ затрат и выгод, надзорные сборы, чрезмерное регулирование, альтернативные издержки, показатель жизнеспособности, банковская стабильность.

Область исследования: Экономические науки.

Цель исследования заключается в выявлении механизма взаимодействия между банковским надзором и жизнеспособностью жизнеспособностью банковской системы, а также в определении оптимального уровня эффективности данного взаимодействия посредством определения критериев и показателей оценки эффективности надзора.

Задачи исследования заключаются в научном обосновании взаимосвязи между эффективностью банковского надзора и жизнеспособностью банковской системы. Исследование направлено на уточнение ключевых понятий, определение критериев эффективности надзора, анализ нормативной базы, разработку составного индикатора жизнеспособности и интеграцию механизма корректировки, учитывающего влияние избыточной капитализации и ликвидности.

Новизна и научная оригинальность работы заключается в разработке модели расчета составного индикатора жизнеспособности банков, который учитывает корректировки на избыточную капитализацию и ликвидность. Эти корректировки отражают ситуации, когда чрезмерные уровни капитала и ликвидности становятся источником неэффективности и создают альтернативные издержки для банков и реальной экономики.

Полученные результаты, способствующие решению важной проблемы. Исследование устраняет отсутствие интегрированного механизма оценки жизнеспособности банков и эффективности надзора в условиях Республики Молдова. Разработан составной индикатор жизнеспособности банков, отражающий соответствие пруденциальным требованиям и эффекты избыточной капитализации и ликвидности. Инструмент предоставляет Национальному банку Молдовы аналитическую основу для принятия решений и оценки влияния регуляторных и надзорных мер.

Теоретическая значимость и практическая ценность работы заключается в расширении научной литературы о взаимосвязи между надзором и жизнеспособностью банков путем формирования концептуальной базы, интегрирующей микро- и макропруденциальные измерения и учитывающей альтернативные издержки. Практическая ценность работы состоит в разработке составного индикатора жизнеспособности банков – воспроизводимого и адаптируемого инструмента диагностики при принятии решений надзорными органами и методологической поддержки исследователей и практиков.

Внедрение научных результатов. Результаты исследования были положительно оценены Директором Независимого аналитического центра «Expert-Grup», Директором Ассоциации банков Молдовы и бывшим первым заместителем Губернатора Национального банка Молдовы. Эта оценка подтверждается сертификатами внедрения, приложенными к диссертации.

DERMENGI DANIELA

**Identifying the criteria of efficient supervision
to maintain the viability of the banking system
522.01 – FINANCE**

Abstract of the doctoral thesis in economics