TASHKENT STATE UNIVERSITY OF ECONOMICS

International journal of topics

INNOVATION SCIENCE AND TECHNOLOGY

Scopus || Electronic journal specializing in Scopus

ISSUE 11

Acceptance of papers **November, 2025**

Acceptance of papers

Published monthly

Topics

economics, technology, social sciences

ISSN 3060-5229

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THE SCIENTIFIC-POPULAR ELECTRONIC JOURNAL **"INNOVATION SCIENCE AND TECHNOLOGY"** HAS BEEN REGISTERED UNDER THE NUMBER **C-5669633** BY THE AGENCY FOR INFORMATION AND MASS COMMUNICATIONS (AOKA) OF THE REPUBLIC OF UZBEKISTAN, EFFECTIVE FROM OCTOBER 9, 2024.

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Electronic publication, Issue 11. 418 pages.
Approved for publication on November, 2025.

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APPROACHES TO ASSESSING THE ECONOMIC SECURITY OF COMMERCIAL BANKS

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Abstract. The article examines the main approaches to assessing the economic security of commercial banks under conditions of increasing financial, operational, and cyber risks. Regulatory, rating-based, indicative, and integral approaches are systematized, and their methodological features, advantages, and limitations are highlighted. Particular attention is paid to integrated assessment methods, discriminant analysis, and stress testing as tools for identifying potential threats and evaluating banking resilience. The study substantiates the necessity of applying a multidimensional system of indicators and proposes a conceptual framework for ensuring the economic security of commercial banks. The findings may contribute to improving risk management practices and strengthening the resilience and sustainable development of banking institutions.

Keywords: commercial banks, economic security of banks, financial stability, risk management, prudential regulation, CAMELS system, integrated assessment, discriminant analysis, banking resilience, sustainable banking development.

Annotatsiya. Maqolada moliyaviy, operatsion va kiberxavflar ortib borayotgan sharoitda tijorat banklarining iqtisodiy xavfsizligini baholashning asosiy yondashuvlari ko‘rib chiqilgan. Me’yoriy, reyting, indikativ va integral yondashuvlar tizimlashtirilib, ularning metodologik xususiyatlari, afzalliklari va qo‘llash imkoniyatlari yoritilgan. Banklar barqarorligini baholash va ehtimoliy tahdidlarni aniqlash vositalari sifatida integral baholash usullari, diskriminant tahlil hamda stress-testlashga alohida e’tibor qaratilgan. Ko‘p o‘lchovli ko‘rsatkichlar tizimini qo‘llash zarurligi asoslangan hamda tijorat banklarining iqtisodiy xavfsizligini ta’minlashning konseptual modeli taklif etilgan. Tadqiqot natijalari risklarni boshqarish tizimini takomillashtirish va bank muassasalari barqarorligini mustahkamlashga xizmat qilishi mumkin.

Kalit so‘zlar: tijorat banklari, banklarning iqtisodiy xavfsizligi, moliyaviy barqarorlik, risklarni boshqarish, prudensial tartibga solish, CAMELS tizimi, integral baholash, diskriminant tahlil, banklar barqarorligi, bank faoliyatining barqaror rivojlanishi.

Аннотация. В статье рассматриваются основные подходы к оценке экономической безопасности коммерческих банков в условиях роста **финансовых, операционных и киберрисков.** Систематизированы нормативный, рейтинговый, индикативный и интегральный подходы, раскрыты их методологические особенности, преимущества и возможности практического применения. Особое внимание уделено интегральным методам оценки, дискриминантному анализу и стресс-тестированию как инструментам выявления потенциальных угроз и оценки устойчивости банков. Обоснована необходимость применения многомерной системы показателей и предложена концептуальная модель обеспечения экономической безопасности коммерческих банков. Результаты исследования могут быть использованы для совершенствования управления рисками и дальнейшего укрепления устойчивости банковских учреждений.

Ключевые слова: коммерческие банки, экономическая безопасность банков, финансовая устойчивость, управление рисками, пруденциальное регулирование, система CAMELS, интегральная оценка, дискриминантный анализ, устойчивость банков, устойчивое развитие банковской деятельности.

INTRODUCTION

Often described as the “bloodstream” of the national economy, the banking system plays a decisive role in ensuring the uninterrupted functioning of the economic mechanism, supporting the implementation of investment projects, facilitating the efficient circulation of payments, and safeguarding public deposits.

Under current conditions, banks operate in an environment of increasing uncertainty. Alongside traditional financial risks, the significance of systemic, operational, and cyber-related risks continues to grow.

Developing an effective framework for monitoring and assessing a bank’s economic security requires a balanced set of both quantitative and qualitative indicators. Such indicators make it possible to evaluate the current level of economic security, identify vulnerable areas, and detect emerging risks at an early stage.

However, the development of such an indicator framework remains one of the most debated issues in banking security theory, as it requires maintaining a balance between methodological comprehensiveness and practical applicability.

LITERATURE REVIEW

In the context of the banking sector, the concept of economic security is highly multidimensional and remains the subject of ongoing academic debate. In general terms, the economic security of a commercial bank can be defined as a condition in which the financial institution is protected from internal and external risks [1], while maintaining its ability to perform its core functions effectively and achieve strategic objectives in a volatile external environment [2].

According to L. Abalkin, “economic security is a set of conditions and factors that ensure the independence of the national economy, its stability and sustainability, as well as its ability to continuously renew and improve” [3]. Thus, economic security implies the stable, sustainable, and efficient functioning of an economic entity.

V. Alenin argues that “the economic security of the regional banking sector is a complex characteristic of the key parameters of its development process, ensuring the timely identification, mitigation, or prevention of risks to the effective reproduction and use of the main elements of its potential as part of the country’s banking system” [1]. This view is methodologically significant, as banks may face various risk situations; therefore, it is important to implement measures aimed at identifying, neutralizing, or minimizing potential risks in a timely manner. These processes are ensured through the economic security system of the bank.

R. Gritsenko notes that “the economic security of the banking system plays a special role in ensuring the economic security of the state, which is due to the penetration of the banking system into all spheres of public life” [2]. Indeed, the economic and national security of a state is closely linked to the stability and resilience of its banking sector.

According to E.V. Zarova and B.O. Tursunov, economic security is a condition in which the national economy is protected from external and internal risks, ensuring the country’s economic sovereignty, the integrity of its economic space, and the necessary conditions for implementing strategic national priorities. At the enterprise level, economic security is defined as a condition in which resources are used efficiently to prevent risks and ensure the stable functioning of the organization [4].

RESEARCH METHODS

The study employed both general scientific and specialized research methods. A systems approach was used to examine economic security as an integrated and multidimensional category. Comparative analysis was applied to evaluate and compare various scholarly interpretations of economic security, while structural-functional analysis was utilized to identify its key components and their interrelationships. In addition, the method of logical generalization was employed to formulate the author’s definition and to synthesize the theoretical findings of the study.

ANALYSIS AND RESULTS

The economic security of a commercial bank comprises a number of interrelated subsystems, each of which plays an important role in ensuring the institution’s sustainable and effective operation [5]. Therefore, a comprehensive assessment of economic security requires due consideration of all functional components and their interactions.

The analysis of the main organizational, legal, and managerial mechanisms aimed at protecting the economic interests of a bank, together with the examination of the key elements supporting its financial and economic activities, made it possible to develop a conceptual model for ensuring the economic security of a commercial bank (Figure 1).

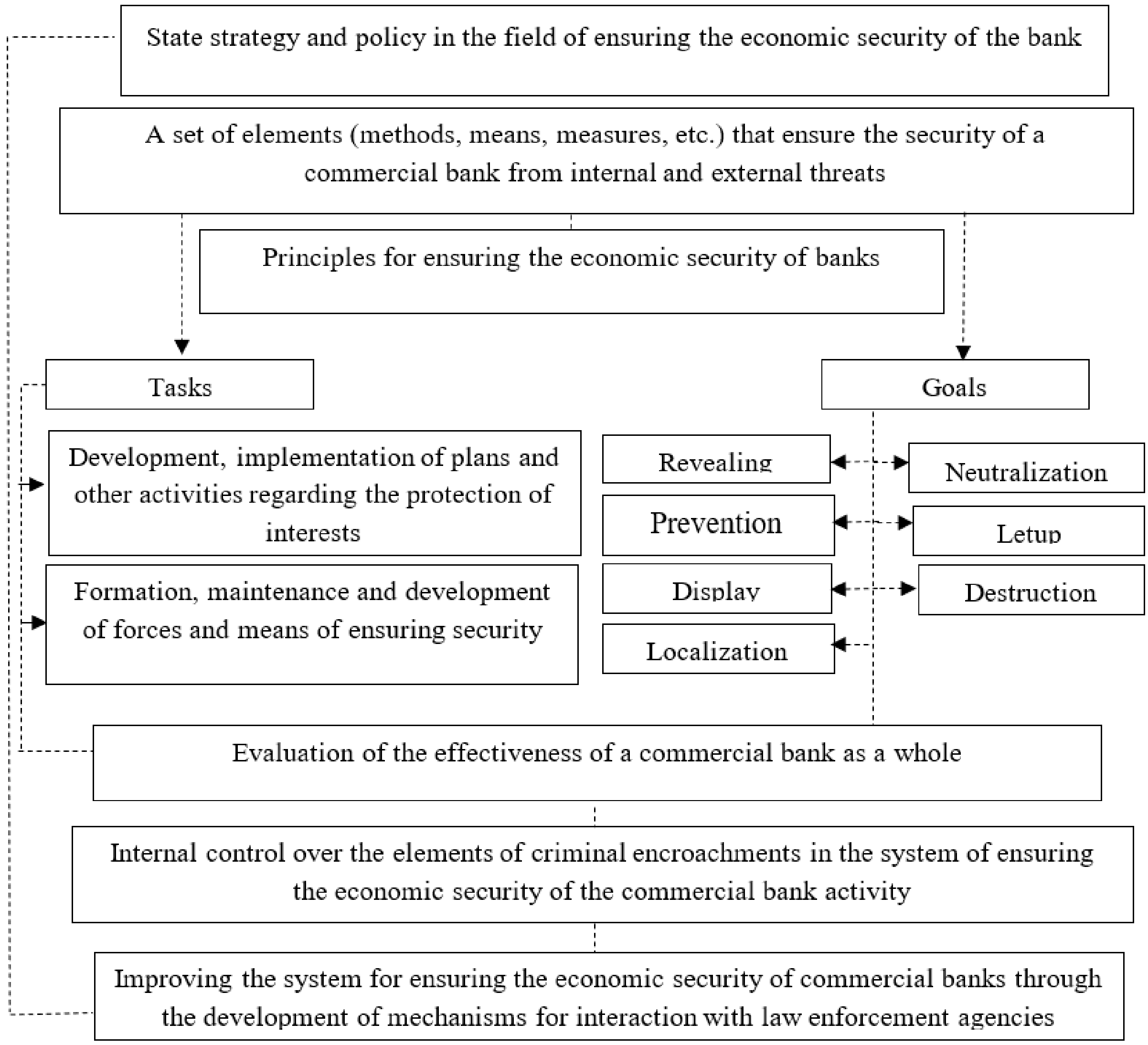

Figure 1. Conceptual model for ensuring the economic security of a commercial bank [6]

Both the theory and practice of banking management have developed several approaches to constructing systems of economic security indicators [7]. These approaches differ in their conceptual foundations, analytical objectives, and methodological tools, while collectively contributing to a more comprehensive assessment of banking resilience and stability.

The methodologies used to assess a bank's economic security can generally be classified into four complementary approaches: regulatory, rating-based, indicative, and integral. These approaches differ in their measurement logic and the mathematical techniques employed, yet each provides valuable insights into the evaluation of a bank's economic security and its capacity to withstand internal and external risks.

The regulatory approach is based on mandatory prudential standards established by supervisory authorities [8]. Within this framework, the assessment of a bank's economic security is primarily focused on determining whether actual indicator values comply with the prescribed regulatory thresholds. For a given standard i, with an actual value V_i and a threshold value T_i, compliance can be represented by an indicator function. The formulation below applies to a minimum ("floor-type") requirement; for maximum ("ceiling-type") requirements, the direction of the inequality is reversed:

$$I_i = \begin{cases} 1, & V_i \geq T_i \\ 0, & V_i < T_i \end{cases}$$

The core prudential ratios include capital adequacy, the liquidity coverage ratio, and the net stable funding ratio:

$$CAR = \frac{C_{T1} + C_{T2}}{RWA} \geq T_{CAR}, \qquad LCR = \frac{HQLA}{NCO_{30}} \geq 100\%, \qquad NSFR = \frac{ASF}{RSF} \geq 100\%.$$

A breach of any binding standard () signals the presence of a material threat.

The rating approach relies on comprehensive supervisory assessment, the most widely recognized example being CAMELS, introduced by the U.S. Federal Deposit Insurance Corporation. Each of its six components - Capital adequacy, Asset quality, Management, Earnings, Liquidity, and Sensitivity to market risk - receives a score on a 1-5 scale (1 = strongest, 5 = weakest), and the composite rating is obtained through aggregation:

$$R_{CAMELS} = \sum_{j=1}^{6} w_j R_j, \qquad \sum_{j=1}^{6} w_j = 1,$$

where, lower composite values correspond to a more secure institution.

The indicative approach builds a system of Key Risk Indicators (KRI), each assigned calibrated threshold values, complemented by an Early Warning System (EWS). For a given KRI value , a discrete signal is generated:

$$S_i = \begin{cases} 0 \text{ (green)}, & k_i < T_i^g \\ 1 \text{ (amber)}, & T_i^g \leq k_i < T_i^r \\ 2 \text{ (red)}, & k_i \geq T_i^r \end{cases}$$

The Early Warning System frequently formalizes the probability of a bank entering a distressed state through a logistic (logit) model:

$$P(\text{distress}) = \frac{1}{1 + e^{-(\beta_0 + \sum_i \beta_i x_i)}},$$

where, are leading risk factors and their estimated coefficients; crossing a predefined probability threshold activates the corresponding response mechanisms.

The integral approach is among the most widely applied methods for assessing the economic security of banks, as it allows numerous heterogeneous indicators to be aggregated into a single composite measure, commonly referred to as the Economic Security Index of the Bank (ESIb). This approach provides a comprehensive evaluation of a bank's financial stability and resilience by incorporating indicators related to capital adequacy, asset quality, liquidity, profitability, operational efficiency, and risk exposure.

To ensure comparability among indicators, the original variables (X_i) are transformed into a standardized scale ranging from 0 to 1. The normalization procedure depends on the economic interpretation of each indicator. For stimulant indicators, where higher values correspond to a higher level of economic security, the min–max normalization method is applied as follows:

$$x_i = \frac{X_i - X_i^{\min}}{X_i^{\max} - X_i^{\min}} \text{ (stimulants)}, \qquad x_i = \frac{X_i^{\max} - X_i}{X_i^{\max} - X_i^{\min}} \text{ (destimulants)}.$$

After normalization, the indicators are aggregated into a single composite index. In practice, four principal aggregation methods are commonly employed, each differing in the manner in which individual indicators contribute to the final assessment. Among these methods, the weighted-sum approach is the most widely applied.

Under this approach, normalized indicators are multiplied by their respective weights, reflecting their relative importance in the overall assessment of economic security, and are subsequently summed to obtain an integrated score. This procedure enables researchers, regulators, and practitioners to account for the varying significance of different dimensions of banking security while producing a transparent, comprehensive, and easily interpretable measure of overall economic security.

$$ESIb = \sum_{i=1}^{n} w_i x_i, \qquad \sum_{i=1}^{n} w_i = 1.$$

It is transparent and easy to interpret but sensitive to the justification of the weights , which are determined through expert judgment or econometric modeling.

The distance (taxonomic) method, following Hellwig, measures the deviation of a bank from a reference (ideal) object with coordinates z_{0j}:

$$d_{i0} = \sqrt{\sum_{j=1}^{m} \left(z_{ij} - z_{0j}\right)^2}, \qquad ESIb_i = 1 - \frac{d_{i0}}{d_0}, \quad d_0 = \bar{d}_0 + 2\sigma_0,$$

where, values closer to 1 denote a higher level of security.

Multivariate discriminant analysis is widely used to classify banks into predefined categories, such as “financially sound” and “problem” institutions, based on as set of financial indicators. This approach combines several variables into a single discriminant score that reflect the overall financial condition and risk profile of a bank. One of the most well-known applications of this method is the banking-adapted Altman Z-model, which assesses the likelihood of financial distress by integrating key performance, liquidity, profitability, and capital adequacy indicators into a comprehensive evaluation measure. The resulting score enables researchers and regulators to identify vulnerable banks at an early stage and to monitor the level of their economic security:

$$Z = \sum_{i=1}^{n} a_i X_i,$$

with cut-off values delimiting the risk zones.

Stress testing quantifies potential losses under adverse conditions; in line with the recommendations of the Basel Committee, both sensitivity-based and scenario-based tests are applied (using historical and hypothetical scenarios) [9,10]. For credit exposures, expected stressed losses can be expressed as:

$$\Delta L = \sum_{i} EAD_i \cdot \Delta PD_i \cdot LGD_i,$$

where, EAD, PD, and LGD and denote, respectively, the exposure at default, the probability of default, and the loss given default under the stressed scenario.

Indicator Blocks. The substantive content incorporated into these approaches is organized according to functional domains.

Operational security reflects the reliability of internal processes and technological infrastructure. It is assessed using indicators such as the number of operational incidents over a given period, IT system recovery time, the frequency of successful cyber incidents, the share of fraudulent transactions, the level of automation of key processes, and business continuity metrics. In addition, this dimension includes cybersecurity indicators, such as the number of vulnerabilities identified through penetration testing, the mean time to detect and respond to information security incidents, the coverage of critical infrastructure by monitoring systems, and the results of cybersecurity stress testing [11].

Legal and regulatory security is evaluated through indicators including the number of regulatory violations, the volume of fines and sanctions imposed, outstanding supervisory requirements, the results of internal and external audits, and AML/CFT-related measures. These measures include the volume of transactions subject to enhanced monitoring, the number of reports submitted to competent authorities, and the number of identified suspicious transactions.

Reputational security is assessed using the Net Promoter Score (NPS), social media and mass media monitoring results, customer satisfaction surveys, independent ratings, the dynamics of the customer base and attracted funds, as well as the bank’s position in industry reliability rankings.

Collectively, these indicator blocks provide the normalized input variables (x_i), which are subsequently aggregated within the integral index to produce a comprehensive assessment of a bank’s economic security.

CONCLUSIONS AND RECOMMENDATIONS

The study examined the principal theoretical and methodological approaches to assessing the economic security of commercial banks and demonstrated that no single method is capable of fully capturing the multidimensional nature of banking security. The regulatory approach ensures compliance with prudential requirements and serves as a key mechanism for limiting excessive risk exposure. The rating approach provides a comprehensive evaluation of a bank’s condition through the aggregation of key performance indicators, while the indicative approach facilitates the early identification of potential risks through the use of risk indicators and early-warning systems. At the same time, the integral approach offers the most comprehensive assessment by combining heterogeneous indicators into a unified Economic Security Index of the Bank (ESIb).

The analysis revealed that the economic security of a commercial bank is a complex and dynamic category encompassing financial, operational, legal, regulatory, informational, and reputational dimensions. Effective management of economic security therefore requires the application of a multidimensional system of indicators supported by advanced analytical tools, including discriminant analysis, taxonomic methods, stress testing, and integrated assessment models.

Based on the findings of the study, it can be concluded that the most effective framework for evaluating and ensuring the economic security of commercial banks is an integrated approach that combines regulatory compliance, risk monitoring, rating assessment, and composite-index methodologies. Such an approach enables a more balanced and comprehensive evaluation of a bank's resilience and capacity to operate sustainably under changing economic conditions.

The proposed conceptual model contributes to a deeper understanding of banking security and may serve as a methodological foundation for enhancing the resilience, stability, and sustainable development of commercial banks in an increasingly complex financial environment. Furthermore, the findings may support the improvement of risk-management practices and the development of more effective mechanisms for safeguarding the economic security of banking institutions.

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Proofreader: Zokir ALIBEKOV

Layout and Designer: Oloviddin Sobir ugli

2025. № 11

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