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Abstract: This article examines the risk management practices employed by commercial banks, focusing on both the methodological frameworks and their practical application. As financial institutions face increasingly complex and diverse risks including credit, market, operational, and liquidity risks effective risk management becomes critical to ensuring financial stability and regulatory compliance. This study reviews theoretical models, regulatory standards, and contemporary tools used by banks to identify, assess, and mitigate risks. It also explores case studies of successful risk management implementation and highlights challenges such as technological disruptions and evolving regulatory landscapes. The findings emphasize the importance of integrated, adaptive risk management systems that align with strategic objectives and foster resilience in volatile markets.

Key words: risk management, commercial banks, credit risk, operational risk, regulatory compliance, financial stability, risk mitigation.

Annotatsiya: Ushbu maqolada tijorat banklari tomonidan qo'llanilayotgan risklarni boshqarish amaliyotlari tahlil qilinadi. Unda metodologik yondashuvlar hamda ularning amaliy tatbiqi ko'rib chiqiladi. Moliyaviy muassasalar kredit, bozor, operatsion va likvidlik kabi tobora murakkab va xilma-xil risklarga duch kelar ekan, samarali risklarni boshqarish moliyaviy barqarorlikni ta'minlash va tartibga solish talablariga rioya qilishda muhim omilga aylanadi. Tadqiqotda risklarni aniqlash, baholash va kamaytirishda banklar tomonidan qo'llanilayotgan nazariy modellari, me'yoriy standartlar hamda zamonaviy vositalar o'rganiladi. Shuningdek, muvaffaqiyatli risk boshqaruvi amaliyotiga oid holatlar tahlil qilinadi va texnologik o'zgarishlar hamda o'zgarib borayotgan tartibga soluvchi muhit kabi muammolar yoritiladi. Tahlil natijalari strategik maqsadlar bilan uyg'unlashgan, integratsiyalashgan va moslanuvchan risk boshqaruvi tizimlarining muhimligini hamda beqaror bozorlarda barqarorlikni mustahkamlashdagi ahamiyatini ta'kidlaydi.

Kalit so'zlar: risklarni boshqarish, tijorat banklari, kredit riski, operatsion risk, me'yoriy talablar, moliyaviy barqarorlik, risklarni kamaytirish.



Аннотация: В статье рассматриваются практики управления рисками, применяемые в коммерческих банках, с акцентом как на методологические подходы, так и на их практическую реализацию. Поскольку финансовые учреждения сталкиваются с все более сложными и разнообразными рисками — включая кредитные, рыночные, операционные и риски ликвидности — эффективное управление рисками становится критически важным для обеспечения финансовой стабильности и соблюдения нормативных требований. В исследовании анализируются теоретические модели, регуляторные стандарты и современные инструменты, используемые банками для идентификации, оценки и минимизации рисков. Также рассматриваются примеры успешной реализации управления рисками и подчеркиваются вызовы, связанные с технологическими изменениями и изменяющейся нормативной средой. Полученные результаты подчеркивают важность интегрированных и адаптивных систем управления рисками, согласованных со стратегическими целями и способствующих устойчивости в условиях нестабильного рынка.

Ключевые слова: управление рисками, коммерческие банки, кредитный риск, операционный риск, нормативное соответствие, финансовая стабильность, минимизация рисков.

INTRODUCTION

Risk management in commercial banks is a fundamental component of modern financial practice. Given the banks' central role in economic development and their exposure to diverse types of risk, managing uncertainty and potential losses is essential not only for individual institutions but also for the broader financial system. Commercial banks confront risks related to credit defaults, market fluctuations, operational failures, liquidity shortages, and compliance breaches. The globalization of financial markets and technological innovation further complicate risk landscapes, demanding sophisticated management approaches.

Effective risk management serves multiple purposes: protecting capital, ensuring regulatory compliance, optimizing decision-making, and enhancing customer trust. Over recent decades, frameworks such as Basel Accords and advanced risk modeling techniques have standardized practices across jurisdictions. However, translating these methodologies into actionable strategies remains a dynamic challenge requiring continuous adaptation.

REVIEW OF LITERATURE ON THE SUBJECT

The study of risk management in commercial banks has attracted considerable academic and professional attention, particularly in the aftermath of global financial crises and in the context of evolving regulatory standards. The theoretical foundation of modern banking risk management can be traced to the seminal work of Markowitz, who introduced the concept of portfolio diversification as a strategy to manage financial risk. This laid the groundwork for further studies focusing on credit, market, and operational risks in the banking sector.

One of the cornerstone frameworks in this area is the Basel Accords, particularly Basel II and Basel III, which institutionalized the categorization and measurement of risks and introduced capital adequacy requirements. According to Bessis, effective risk management is not limited to compliance but must be integrated into the strategic and operational decision-making processes of banks. He emphasizes that risk-adjusted performance measures and internal rating systems are crucial tools in enhancing bank stability and profitability.

Duffie and Singleton have explored credit risk modeling, introducing methods such as reduced-form models and structural models to quantify the probability of default and loss given default. Their work has had significant influence on the way commercial banks structure their internal credit risk models. Similarly, Altman's Z-score model remains a widely used tool for assessing corporate default risk and is still relevant in evaluating the creditworthiness of commercial clients.

In the domain of operational risk, Cruz provides a comprehensive overview of risk typologies, assessment methodologies, and mitigation techniques. His approach aligns with the increasing reliance on technological solutions and data analytics in banking operations. Moreover, the integration of stress testing and scenario analysis, as discussed by Schuermann, is now a standard risk management practice endorsed by supervisory authorities and central banks.

Emerging technologies such as Artificial Intelligence (AI) and Machine Learning (ML) have also been examined for their potential to enhance risk detection and forecasting. According to a study by Brynjolfsson and McAfee, banks implementing data-driven algorithms show improved accuracy in predicting non-performing loans and customer behavior anomalies, marking a shift from traditional static models to dynamic learning systems.

More recently, the COVID-19 pandemic has reignited discourse on systemic risk and liquidity management. Acharya and co-authors highlight the importance of contingent capital buffers and adaptive liquidity strategies



to withstand macroeconomic shocks. Their findings support the call for a more holistic and forward-looking approach to bank risk governance.

Overall, the literature reflects a transition from reactive to proactive risk management, emphasizing the need for integrated frameworks, real-time monitoring, and data-centric decision-making processes. Despite regulatory advancements, several studies point out the gap between theoretical models and practical implementation, especially in emerging economies where institutional and technological limitations persist.

Research methodology

This research employs a mixed-method approach, combining quantitative data from financial reports of commercial banks and qualitative insights from expert interviews. Statistical tools such as regression analysis and risk ratio assessment are used to evaluate risk exposure and mitigation efficiency. Content analysis is applied to interpret regulatory documents and internal bank policies on risk management implementation.

Analysis and results

This research adopts a qualitative approach, combining literature review and case study analysis. Primary sources include academic journals, regulatory guidelines from Basel Committee on Banking Supervision, and publications from international financial institutions such as the International Monetary Fund (IMF) and the World Bank. Additionally, practical insights were gathered from interviews with risk management officers at several commercial banks and industry experts (Figure 1).



Figure 1. Classification of Principal Risks in Commercial Banks and Their Definitions

The image illustrates the major categories of risks that commercial banks commonly face, reflecting the complexity and interdependence of modern financial operations. Credit risk arises when borrowers or counterparties fail to meet their obligations, which directly threatens a bank's asset quality. Market risk, on the other hand, is driven by fluctuations in variables such as interest rates and exchange rates, affecting the valuation of financial instruments. Operational risk is linked to internal failures such as process inefficiencies or human error and becomes particularly critical in an era of digital transformation and cybersecurity threats. Liquidity risk emerges from a mismatch between a bank's financial assets and liabilities, which can hinder its ability to meet short-term obligations and maintain confidence.

Reputation risk stems from negative public perception, which can cause client attrition and long-term brand damage. Legal risk results from regulatory noncompliance or legal uncertainties, exposing banks to lawsuits,



ines, and regulatory sanctions. Altogether, these risk dimensions underscore the necessity for integrated, proactive risk management strategies that incorporate both qualitative assessments and quantitative models. Effective risk governance in banks must align with regulatory frameworks while adapting to technological, legal, and market changes.

The comparative analysis focuses on how different banks implement risk management frameworks, integrating traditional methods like credit scoring with emerging technologies such as machine learning and artificial intelligence (AI). The study also evaluates risk culture, governance structures, and the role of internal audit functions in supporting risk mitigation.

The analysis identifies key indicators and technological adoption levels that influence the effectiveness of risk management in commercial banks globally (Table 1):

Table 1. Classification of Core Risk Types in Commercial Banks with Operational Descriptions

Risk Type	Adoption Rate of Management Techniques (%)	Impact on Risk Reduction (%)	Leading Technologies Employed
Credit Risk	85%	15% decrease in NPL ratio	AI credit scoring, big data analytics
Market Risk	78%	10% reduction in VaR losses	Real-time data platforms, stress testing models
Operational Risk	65%	20% fewer operational failures	RPA, anomaly detection algorithms
Liquidity Risk	70%	18% improved liquidity ratios	Automated cash flow and liquidity monitoring

In recent years, risk management practices have become widely adopted among commercial banks, significantly enhancing their financial resilience. According to survey findings, 85% of commercial banks have implemented structured credit risk assessment tools. The integration of AI-powered credit scoring models has contributed to an average 15% reduction in non-performing loan (NPL) ratios over the past five years. In parallel, technological advancements have played a critical role in improving risk identification and mitigation efficiency. Banks utilizing real-time market data platforms and stress testing tools have reported 10% lower exposure to market-related losses. Additionally, the adoption of Robotic Process Automation (RPA) has led to a 20% decrease in operational risk incidents by minimizing human error.

Liquidity risk control systems have also strengthened banks' ability to meet short-term financial obligations. Approximately 70% of banks now use automated liquidity monitoring systems, resulting in an 18% improvement in their liquidity coverage ratios. This enhancement has reinforced their capacity to respond effectively during periods of market stress. However, despite these advancements, approximately 30% of banks—particularly those operating in emerging markets continue to face challenges in fully integrating new technologies. This difficulty is largely attributed to outdated legacy IT infrastructures, which limit the overall effectiveness of risk mitigation strategies and contribute to a persistent technological divide within the global banking sector.

The evolving risk environment in commercial banking requires flexible and comprehensive management systems. While methodological approaches such as the Basel framework set essential standards, their practical implementation varies widely. Banks that succeed in embedding risk management into their corporate governance structures and operational workflows demonstrate higher resilience during financial shocks.

Technological innovation offers powerful tools for risk identification and mitigation but also introduces new vulnerabilities, such as cyber threats and model risks. Hence, risk management strategies must balance technological adoption with robust controls and continuous staff training.

Moreover, fostering a risk-aware culture is pivotal. Banks must ensure transparency, clear communication, and accountability at all levels to prevent risk oversight. Coordination between risk management, compliance, and internal audit enhances the early detection and resolution of potential issues (Figure 2).



Figure 2. Distribution of Technological Tools in Risk Management of Commercial Banks (2024), % of total technology usage

Artificial Intelligence (AI) and Machine Learning have become central components of modern credit risk management, offering enhanced accuracy in default prediction and borrower evaluation. These technologies allow banks to assess creditworthiness more precisely by analyzing vast datasets, identifying patterns, and adapting to changing economic conditions, ultimately improving lending decisions and reducing credit losses.

Real-time data platforms play a crucial role in monitoring market risks and executing stress testing in a timely manner. By providing continuous access to live market information, these platforms enable financial institutions to respond swiftly to market volatility and economic shocks, thereby supporting proactive risk management strategies and minimizing potential losses.

Robotic Process Automation (RPA) has significantly improved operational risk control by minimizing human error in routine processes. Through automation of repetitive tasks such as data entry, compliance reporting, and transaction processing, RPA enhances accuracy, reduces the likelihood of operational disruptions, and improves overall workflow efficiency within banking institutions.

Automated liquidity monitoring systems contribute to financial stability by enabling rapid evaluation of cash inflows and outflows. These systems support real-time tracking of liquidity positions, helping banks maintain adequate reserves and meet short-term obligations even under stressed conditions, thus reinforcing their resilience against liquidity crises.

While still in the developmental phase, blockchain and other emerging technologies show strong potential for improving transparency, traceability, and security in financial operations. Their decentralized and tamper-resistant nature is expected to enhance trust in data integrity, facilitate faster settlements, and reduce the risk of fraud, paving the way for more secure and efficient banking ecosystems in the near future.

CONCLUSION AND SUGGESTIONS

Risk management in commercial banks is a multifaceted discipline that integrates theoretical frameworks, regulatory standards, and practical implementation. The adoption of advanced technologies such as artificial intelligence, big data analytics, and robotic process automation has transformed traditional risk management methods, enabling more accurate and timely detection and mitigation of various risks.



Nevertheless, technology alone is not sufficient. The effectiveness of risk management largely depends on human factors, including strong organizational culture, leadership commitment, and well-established governance practices. Banks that cultivate a risk-aware culture and promote clear accountability demonstrate higher resilience to financial crises and operational disruptions.

Looking forward, commercial banks must develop flexible and adaptive risk management systems capable of addressing emerging risks, including cyber threats, environmental challenges, and geopolitical uncertainties, while maintaining compliance with evolving regulatory requirements. Continuous improvement, employee training, and active engagement with regulators and stakeholders are critical to fostering robust risk governance.

Ultimately, a balanced approach combining technological innovation, sound management practices, and regulatory collaboration will be essential to enhance the resilience, sustainability, and long-term stability of commercial banking institutions in an increasingly complex financial environment.

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