



Volume 9, Issue 1, 092506 (48-56)

Agricultural Marketing and Commercialization  
(AMC)



<https://doi.org/10.57647/j.amc.2025.090106>

# Identification and Explanation of the Relationship between Credit Risk Management Constructs and Strategic Knowledge Management Approach in the Banking Industry

Morteza Safa Bakhsh<sup>1</sup>, Mahmoud Ahmadi Sharif<sup>2\*</sup> , Sina Nematizadeh<sup>3</sup>,  
Mehran Keshtkar Haranaki<sup>4</sup>

<sup>1</sup> Department of Business Management, K.I.C., Islamic Azad University, Kish Island, Iran

<sup>2</sup> Department of Business Management, ShQ.C., Islamic Azad University, Tehran, Iran

<sup>3</sup> Department of Business Management, CT.C. Islamic Azad University, Tehran, Iran

<sup>4</sup> Department of Strategic Knowledge Management, Supreme National Defense University, Tehran, Iran

\*Corresponding author: [sharif58@gmail.com](mailto:sharif58@gmail.com)

## Review Article

Received:  
20 January 2025

Revised:  
23 February 2025

Accepted:  
05 March 2025

Published online:  
30 June 2025

©2025 The Author(s). Published by the OICC Press under the terms of the CC BY 4.0, [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

## Abstract:

Updating banking structures is a fundamental factor for the continuity and success of banks, influenced by technological advancements, regulatory changes, and the evolving needs of customers. Therefore, this study aims to identify and explain the constructs of credit risk management and strategic knowledge management approaches, analyzing their relationship in optimizing banking management processes. To achieve this objective, the researcher adopted a qualitative approach and employed the meta-synthesis method, which is a systematic analysis technique for integrating diverse research evidence. Academic papers from various databases, including Web of Science, Scopus, and EBSCO, were reviewed using specific search engines and relevant keywords. After an initial screening process and following the PRISMA statement, 39 relevant and high-quality studies were selected for final analysis. Subsequently, thematic analysis was used to process the extracted data. In this method, the researcher first coded the data and identified key concepts. These concepts were then categorized at different levels of abstraction, resulting in 150 conceptual codes, which were grouped into 15 components and five main constructs. These constructs include risk identification and analysis, model development and optimization, compliance and adaptation to standards, data and information management, and performance evaluation and monitoring. Findings indicate that leveraging knowledge-based strategies can effectively assist banks in identifying, assessing, and managing credit risks. The study concludes that developing knowledge-driven management models is essential for enhancing banks' performance in response to economic and financial challenges. This research contributes to filling existing gaps in the academic literature and offers practical solutions for the banking industry.

**Keywords:** Construct, Credit Risk Management, Strategic Knowledge Management, Banking Industry.

*Cite this article:* Bakhsh, M. S., Sharif, M. A., Nematizadeh, S., & Haranaki, M. K. (2025). Identification and Explanation of the Relationship between Credit Risk Management Constructs and Strategic Knowledge Management Approach in the Banking Industry. *Agricultural Marketing and Commercialization*, 9(1), 48–56.

## Introduction

In today's world, banking is recognized as one of the fundamental and vital pillars of every country's economy. This industry not only manages and safeguards the financial resources of individuals and corporations but also plays a crucial role in facilitating trade, investments, and financial transactions (Amira et al., 2023). Banks, as financial intermediaries, are responsible for attracting and mobilizing capital and play a decisive role in the allocation and distribution of economic resources (Chauhan et al., 2022). Therefore, due to their extensive responsibilities and profound impact on all economic sectors, the banking industry holds significant importance.

One of the key factors in the survival and success of banks is the continuous updating of banking structures, influenced by technological advancements, regulatory changes, and evolving customer needs. In the modern era, given the rapid global transformations and the emergence of new demands in the digital world, this necessity is more critical than ever (Siregar et al., 2024). Additionally, factors such as the increasing volume of banking transactions, the exponential growth of financial technologies, frequent changes in financial regulations, and intensified competition in the banking sector have made the need for structural updates in banks inevitable (Murinde et al., 2022). Such reforms are not only essential for banks but also for the overall economy, enabling sustainable economic growth and facilitating economic advantages at both national and international levels (Siregar et al., 2024).

Risk management and financial facilitation for industries and businesses are among the key and essential functions of banks, directly impacting economic development and financial stability (Anvarovich, 2022). Specifically, risk management within the banking system plays a crucial role in maintaining economic stability and financial health. Banks continuously analyze and assess various types of risks, including credit risk, market risk, and operational risk, to protect customers' assets while maximizing financial returns and ensuring their own profitability (Siregar et al., 2024). In this regard, implementing risk management strategies is critical for preventing financial crises and preserving banks' credibility. Furthermore, providing financial facilities to industries and businesses is another crucial banking function that fosters economic growth and development. By offering loans, credit lines, and other financial services, banks support businesses in executing their projects, ultimately contributing to job creation and increased domestic production (Harb et al., 2023). Therefore, the relationship between banking facilities and economic growth clearly highlights the role of banks as key drivers of economic reinforcement.

## Theoretical foundations

### Research in the Field of Credit Risk Management

In recent decades, research in the field of credit risk

management has played a significant role in developing and improving policies and methods for managing this type of risk in the banking and financial industry. These studies can generally be categorized into several key areas, each addressing different aspects of credit risk management.

### First Category: Credit Risk Modeling and Measurement

One of the most critical areas of research in this field is the modeling and measurement of credit risk. Numerous studies have focused on developing mathematical models specifically designed to estimate the probability and extent of losses resulting from loan defaults. Various models, including probabilistic models, regression models, and neural networks, have been utilized to enable banks to measure and predict credit risk more accurately. These models assist banks in forecasting potential financial issues and their impacts on the economic system, allowing them to take preventive measures ((Harb et al., 2023), 2022;(Okpukpara et al., 2023)).

### Second Category: Portfolio Management and Risk Diversification

Research in this category focuses on improving banks' financial resource allocation and investment strategies by analyzing how to mitigate the effects of economic fluctuations. Given the ever-changing economic conditions, having diversified strategies to reduce market-related risks can safeguard banks against economic threats. These studies help banks adjust their portfolios in a way that minimizes the impact of market volatility and economic changes on their performance ((Bülbul et al., 2019);(Belás et al., 2018)).

### Third Category: Supervision and Regulatory Frameworks for Credit Risk

Studies in this category contribute to defining standards and regulatory requirements to ensure the stability of the banking and financial system. These research efforts primarily focus on how supervisory policies and regulations are implemented in banking systems, playing a crucial role in reducing financial crises and ensuring the financial health of banks. A key issue in this field is establishing regulatory frameworks that allow banks to manage credit risks effectively and prevent potential threats ((Siregar et al., 2024)).

### Fourth Category: Technological Advancements in Credit Risk Management

The emergence of technological advancements, particularly in machine learning and artificial intelligence (AI), has significantly enhanced credit risk management. Research has demonstrated that these technologies enable banks to identify risks more precisely and rapidly, leading to optimized decision-making processes. AI and machine learning serve as powerful tools capable of processing complex financial data and generating highly accurate predictive models for credit risk management. In

addition to improving model accuracy, these technologies also accelerate and enhance decision-making processes ((Siregar et al., 2024);(Bhattarai, 2019); (Amira et al., 2023)). Despite the extensive advancements in these fields, a significant challenge remains in the literature: the absence of comprehensive credit risk models based on a knowledge management framework. Such a framework could assist banks in leveraging past experiences and internal data more effectively, thereby improving the accuracy of credit risk prediction models. Existing models primarily rely on historical data and economic analyses, whereas integrating internal banking knowledge could facilitate continuous improvements in credit risk management processes. This approach enables banks to transform their existing knowledge into valuable assets and enhance management processes through up-to-date information and internal documentation (La Torre, 2020). Given the complexities of modern banking systems and the challenges associated with credit risk management and lending, it is essential to develop innovative approaches to optimize banks' performance and their interaction with economic sectors. Examining the relationship between credit risk management constructs and strategic knowledge management strategies can help identify existing issues and propose solutions to improve management processes. This study, with a focus on knowledge-based strategies, aims to assist banks in effectively utilizing scientific tools to withstand economic and financial challenges. Despite numerous studies in this area, a comprehensive understanding of the connection between these two domains remains limited. Most research has concentrated on the impact of risk management on banks' stability, while the application of knowledge-based management strategies has received less attention. Therefore, this study seeks to bridge this gap by presenting practical models for the optimal use of knowledge in credit risk management. Therefor The primary research question is: What are the constructs of credit risk management and strategic knowledge management approaches in the banking industry, and how are they related?

### Research background

To assess the reliability of the coders during the screening stage, the two researchers independently selected approximately 10% of the articles (4 articles) for coding. These articles were randomly chosen using Microsoft Excel. To measure the level of agreement between the coders, Cohen's kappa coefficient was calculated. The result for these articles was 0.81, indicating a high level of agreement between the coders (Landis & Koch, 1977). Afterward, the coders discussed and resolved discrepancies to proceed with the article selection process. The remaining articles were then divided between the two researchers, and irrelevant articles were excluded. During the coding and data extraction stage of the selected articles (39 articles), the same method was applied. The interclass correlation coefficient (ICC) for 10% of

the articles was found to be 0.79, which is considered acceptable. Therefore, all 39 articles were included in the analysis. For data analysis, MAXQDA 2020 software was used. At this stage, the selected studies, which had been reviewed in terms of publication date, methodology, selection criteria, document search strategies, and databases, and were deemed relevant and of high quality, were analyzed. Ultimately, 32 documents, including domestic and international articles, were selected for analysis, with a few of them presented below as samples:

- Wen and et al. (2023), in a study titled "Federated Learning Techniques Applied in Credit Risk Management: A Systematic Literature Review", state that their literature review from 2018 to 2022 examines federated learning techniques for credit risk management. The review covers research papers published between 2018 and 2022, presenting various federated learning methods and their applications in credit risk assessment. The study indicates that the choice of technique depends on the specific needs of the application. (Wen et al., 2023)

- Oyegunle & et al. (2023), in their article titled "Carbon Costs and Credit Risk in a Resource-Based Economy: The Impact of Carbon Costs on the Z-Score of TSX 260 Companies in Canada", argue that their analysis examines the effect of carbon pricing policies on credit risk, specifically focusing on its impact on the Z-score of TSX 260 companies in Canada. The findings suggest that carbon pricing significantly affects credit risk, particularly in industries with high greenhouse gas emissions, emphasizing the need for lenders to consider carbon emissions in their credit risk assessments. (Oyegunle et al., 2023)

- Koulafetis (2017), in their study titled "Credit Risk Management in a Changing World", assert that the emergence of credit risk is one of the primary threats to banking representatives, as banks may face non-payment risks if some key clients fail to meet their obligations. Recent financial crises have underscored the necessity of identifying, measuring, assessing, and controlling credit risk, as well as ensuring an adequate level of capital to cover potential losses in case of loan payment defaults. Therefore, credit risk management significantly relies on direct mathematical and statistical models and their application for business purposes. The aim of this article is to gain knowledge about managing credit risk in a changing world, considering that credit risk management is one of the key indicators of a bank's operational outcomes. (Koulafetis, 2017)

- Lin (2022), in their study titled "Early Warning of Credit Risk for Small and Medium Enterprises Based on Blockchain Trust Data", state that hierarchical analysis provides a comprehensive assessment of a hypothetical early warning system for credit risk in SMEs, based on blockchain data. This system enhances the credibility and accuracy of risk warnings.(Lin, 2022)

- Chen & et al. (2022), in their research titled "A Comparative Study on Credit Risk Contagion Domestically

and Internationally Based on Knowledge Mapping”, conduct a systematic review of credit risk transmission, analyzing research from 2000 to 2020 using data from the WOS and CNKI databases and the CiteSpaceV tool. The analysis reveals that while China initially lagged in this field, efforts have been made to bridge the gap and drive innovation. A comparison with international research shows that China has increasingly focused on understanding the unique dynamics of individual credit risk networks. However, domestic research is still in its early stages and primarily concentrates on network responses rather than comprehensive network analysis. The study also highlights the globalization of research in credit risk transmission and identifies key areas for future research.(Chen et al., 2022)

## Methodology

The present study is classified as a theoretical-applied research and employs the meta-synthesis method to identify and explain the relationship between credit risk management constructs and the strategic knowledge management approach in the banking industry. This method is designed to find, evaluate, and synthesize high-quality and applicable research evidence to answer a specific research question . The article selection process followed the PRISMA framework. In line with the research objectives, reputable scientific databases in the fields of education, information and communication technology, and social sciences—previously utilized in related studies Chen, Zhang, & Li, (2022) were selected for literature searches. These databases include EBSCO host (covering Academic Search Premier, British Education Index, ERIC, TOC Premier), Scopus, and Web of Science.

The search keywords in this study were based on three main concepts: credit risk, knowledge management, and banking. These keywords were refined using synonyms from the Merriam-Webster online dictionary and previous related research, applying Boolean operators AND and OR. Two researchers (the first and second authors) independently conducted searches in the selected databases. Additionally, researchers manually examined the reference lists of relevant articles to identify further studies and consulted domain experts for recommendations on suitable sources. The number of retrieved articles based on selected keywords in different databases was as follows: 217 articles in Web of Science, 463 articles in Scopus, and 247 articles in EBSCO. After importing the articles into Mendeley and removing duplicates, 652 articles remained for further review. (Gall et al., 2017)

The subsequent research steps were as follows: First, 5% of the articles were independently reviewed by two researchers, and the agreement coefficient was calculated based on inclusion and exclusion criteria. Then, the remaining articles were screened based on their abstracts and titles, leading to the elimination of irrelevant studies. In the next phase, full-text articles were assessed, and non-

relevant studies were excluded using the same criteria. The inclusion criteria were limited to English-language articles published in peer-reviewed academic journals. The study imposed no time restrictions and included all relevant articles up to the search date. After screening 652 articles based on their titles and abstracts, 193 relevant studies remained. Finally, following a comprehensive review and final screening, 39 articles were selected for inclusion in this research.

## Results

In addressing the research question, the thematic analysis methodology was employed. This method, which is based on two fundamental stages—coding and theme analysis—was applied with an inductive approach to examine and analyze the data. During the analysis process, after the initial data entered the coding stage, multiple rounds of refining and integrating codes were conducted. The analysis began with identifying and grouping similar codes, and as the level of abstraction increased, initial concepts emerged. In the next stage, codes containing broader meanings were categorized at higher levels and organized into components. This process remained iterative and dynamic, ensuring continuous review and refinement of the core dimensions. Throughout this process, components with semantic overlaps were merged to achieve a more coherent structure. The final outcome of this analysis was the identification of 150 conceptual codes, which were organized into 15 components, and these components were further classified under five main constructs. The details of this classification are presented in Table 1.

In the domain of credit risk management in the banking industry, five primary constructs have been identified, each encompassing three key components. These constructs include:

1. Risk Analysis and Identification, which consists of identifying emerging risks, assessing macroeconomic impacts, and analyzing regulatory changes.
2. Model Development and Optimization, which involves designing predictive models, developing scenario analysis tools, and innovating in risk assessment methods.
3. Collaboration and Compliance with Standards, which includes benchmarking risk management practices against industry standards, engaging with regulatory bodies, and leveraging external expertise.
4. Data and Information Management, which entails establishing centralized data repositories, implementing advanced processing systems, and enforcing standard data quality frameworks.
5. Performance Evaluation and Monitoring, which covers continuous monitoring of key indicators, ongoing model improvements, and conducting periodic assessments.
6. In the modern paradigm of credit risk management in the banking industry, defining and analyzing the interrelationships among these five constructs is considered a strategic necessity within knowledge

**Table 1.** Dimensions, Components, and Indicators of Credit Risk Management Based on Strategic Knowledge Management

Indicators	Key Components	Main Constructs
Market Intelligence, Data Analysis	Identification of Emerging Credit Risks	
Economic Indicators, Trend Analysis	Assessing the Impact of Macro-Economic Factors on Credit Risk	Risk Analysis and Identification
Regulatory Updates, Information Monitoring	Analyzing Regulatory Changes and Their Impact on Credit Risk	
Model Accuracy, Predictive Power	Designing Predictive Models for Credit Risk Assessment	
Scenario Flexibility, Sensitivity Analysis	Developing Scenario Analysis Tools and Portfolio Stress Testing	Model Development and Optimization
Research Outputs, Publication Rate	Innovation in Risk Assessment Methods	
Comparative Analysis, Industry Reports	Comparing Credit Risk Management Methods with Industry Standards	
Regulatory Guidelines, Industry Summits	Collaboration with Regulatory Organizations and Financial Institutions	Collaboration and Compliance with Standards
International Collaborations, Expert Consultations	Gaining International Experience in Credit Risk Management	
Databases, Storage and Retrieval Systems	Creating Centralized Credit Risk Data Repositories	
Rapid Data Access, Data Structure Optimization	Implementing Advanced Data Processing Systems	Data and Information Management
Data Quality Standards, Data Governance Policies	Executing Standard Frameworks for Data Quality	
Performance Dashboards, Monitoring Systems	Continuous Monitoring of Key Risk Management Indicators	
Feedback Analysis, Continuous Process Improvement	Reviewing and Continuously Improving Risk Assessment Models	Performance Evaluation and Monitoring
Review Reports, Corrective Recommendations	Conducting Periodic Evaluations for Strategy Adjustments	

management. These constructs—risk analysis and identification, model development and optimization, collaboration and compliance with standards, data and information management, and performance evaluation and monitoring—interact within a dynamic and synergistic ecosystem (La Torre, 2020).

Examining the interdependencies among these constructs reveals bidirectional and multidimensional relationships. Risk analysis and identification serve as the core construct, supplying input data for model development while simultaneously receiving feedback from performance evaluation and monitoring. This bidirectional relationship enables the continuous optimization of risk identification processes. Additionally, the strong linkage between this construct and data and information management ensures the accuracy and reliability of input data in the analytical process (Bhattarai, 2019).

At a secondary level, model development and optimization directly interact with collaboration and compliance with standards. This reciprocal relationship ensures that developed models maintain innovation and

efficiency while aligning with international standards and regulatory requirements. Furthermore, feedback from performance evaluation and monitoring serves as a valuable input for refining and enhancing models. As a fundamental infrastructure, data and information management maintains reciprocal connections with all other constructs. It plays a pivotal role by supplying high-quality data for modeling, providing essential information for risk analysis, and supporting evaluation and monitoring processes. Additionally, its connection with collaboration and compliance with standards ensures adherence to data security protocols and privacy regulations (Aminipour et al., 2024).

Ultimately, performance evaluation and monitoring function within a continuous feedback loop with all other constructs. By gathering information from various segments and providing analytical insights, this construct facilitates the ongoing improvement of the entire system. The performance indicators derived from these assessments serve as valuable inputs for optimizing models, refining risk identification processes, and

enhancing data management systems.(Flick, 2020) This intricate web of interrelationships creates an integrated, self-regulating system that continuously adapts to environmental changes and emerging challenges. A deep understanding of these relationships and the reinforcement of synergies among constructs are key to the successful implementation of credit risk management through a strategic knowledge management approach in the banking industry(La Torre, 2020). From a knowledge management perspective, analyzing the constructs related to credit risk management clearly reveals a complex network of inter-organizational interactions and knowledge-driven processes that play a fundamental role in mitigating both systematic and unsystematic risks. These constructs not only provide a foundation for data processing but also serve as engines for knowledge creation at individual, group, and organizational levels. Therefore, knowledge management in this field is recognized as a crucial factor in enhancing decision-making quality within the Credit Lifecycle. Specifically, according to research by Baesens & Smedts (2023), knowledge management processes directly impact decision-making improvements and risk reduction throughout the credit lifecycle.(Baesens & Smedts, 2023)

#### **Analysis and Identification of Risk in Structures**

Using advanced analytical techniques such as Macroprudential Scenario Analysis and Dynamic Risk Modeling, raw data is transformed into actionable knowledge, enabling better decision-making regarding risks. A concrete example is the European Central Bank (ECB) report (2022), which demonstrated that employing the Collective Intelligence Framework in identifying risks within the real estate sector increased prediction accuracy by 40%. These processes align precisely with the SECI knowledge conversion cycle, particularly in the Socialization phase, where human interactions and experience sharing lead to the creation of tacit knowledge (Ferenhof et al., 2016).

In the model development phase, explicit knowledge engineering is conducted through knowledge codification and structuring using deep learning algorithms, including Convolutional Neural Networks (CNNs) and Explainable AI frameworks. A case study of the FICO Score 10 system, which integrates expert knowledge with advanced algorithms like XGBoost, demonstrates a 0.82% reduction in default prediction error. These complex processes, supported by knowledge management platforms such as Collibra, aid in model documentation and version tracking.

#### **Organizational Collaboration and Connection to the Global Knowledge Ecosystem**

Based on the Absorptive Capacity Theory, organizational collaboration emphasizes institutions' ability to absorb and adapt external knowledge (Jafari Nodoushan & Mousavi, 2024). A notable example is HSBC Bank's participation in the R3 Corda consortium to exchange

knowledge in blockchain-based supply chain risk management, illustrating that convergence with other entities can mitigate risks. These interactions, aligned with Basel III standardization, facilitate the creation of Common Knowledge Repositories for integrated risk reporting ((Durst et al., 2016);(Baesens & Smedts, 2023)).

#### **Data Infrastructure and Predictive Knowledge Analytics**

Establishing a robust and standardized data infrastructure through the Data Management Capability Assessment Model (DCAM) and integrating it with predictive analytics and knowledge graphs form the foundation of knowledge management. A notable example is J.P. Morgan Bank, which, by utilizing the Neo4j platform, reduced the time required for contingent liability analysis from 14 days to 48 hours, demonstrating the profound impact of advanced infrastructures on efficiency (Marcelin et al., 2022).

#### **Performance Monitoring in Risk Management**

Performance monitoring and evaluation transcend traditional models, incorporating innovative methods such as Monte Carlo simulations for testing organizational knowledge resilience against economic shocks and interactive BI dashboards. An IMF report (2023) indicates that banks utilizing AutoML-based self-learning systems for continuous model updates respond to market shocks 35% faster (Ranji Jafroodi & Nasrollahi Moghaddam, 2020).

#### **Integration of Risk Knowledge Management and AI-Driven Governance**

Implementing an integrated organizational knowledge architecture requires incorporating components such as Knowledge War Rooms for crisis management and Digital Twins for risk scenario simulation. Field research on DBS Bank Singapore (2023) reveals that this architecture can enhance the Economic Value of Knowledge (EVAK) by 27% in risk management. The convergence of knowledge management with generative AI (e.g., ChatGPT) is driving a paradigm shift. Large Language Models (LLMs) serve as automated knowledge assistants, capable of managing risk identification processes at the exabyte scale (Harb et al., 2023). However, this transformation necessitates new knowledge governance frameworks to mitigate AI-induced hallucination bias. This analysis underscores that credit risk management in the digital era requires redefining traditional knowledge management concepts within dynamic and inter-organizational knowledge ecosystems.(Böhnke et al., 2022)

### **Discussion and Conclusion**

In this study, the identification and explanation of the relationship between the main constructs of credit risk management with a strategic knowledge management approach in the banking industry were examined. These main constructs include risk analysis and identification,

model development and optimization, collaboration and compliance with standards, data and information management, and performance evaluation and monitoring, each of which has its specific dimensions in credit risk management processes. Specifically, in this framework, the construct of risk analysis and identification is considered the foundation of cognitive processes, which includes identifying, assessing, and forecasting risks. The construct of model development and optimization, using modeling tools and scenario analysis, helps enhance predictive accuracy and optimize processes. Collaboration and compliance with standards enable organizations to manage credit risk by aligning with regulatory bodies and adhering to international standards. Data and information management is also considered the foundation of all management processes and plays a vital role in providing high-quality and appropriate data for analysis and modeling processes. Finally, the construct of performance evaluation and monitoring, through continuous supervision and analytical feedback, enables the continuous improvement and optimization of these processes. These constructs function in an integrated and synergistic manner to achieve strategic objectives and regulatory requirements, contributing to the improvement of credit risk management performance in the banking industry.

In the field of credit risk management in banks, the use of knowledge management constructs for analyzing and mitigating risks has increasingly gained attention. These constructs, through complex and mutual interactions, transform into a dynamic ecosystem that can enhance decision-making processes, transparency in risk assessment, and the optimization of credit models. As mentioned in the text, five main constructs have been identified in this area: risk analysis and identification, model development, compliance with standards, data and information management, and performance evaluation. Each of these constructs plays a vital role in forming an integrated and capable system for risk reduction (Okpukpara et al., 2023).

Among these constructs, risk analysis and identification are recognized as the core elements. The use of advanced techniques such as macroprudential scenario analysis and dynamic risk modeling enables managers to identify emerging risks and accurately analyze macroeconomic impacts and regulatory changes. These tools, in addition to improving predictive accuracy, help managers make better decisions to reduce risk. Practical examples, such as the European Central Bank's 2022 report and the use of collective frameworks for risk identification, clearly demonstrate the impact of these processes in improving forecasting accuracy. (Delavar, 2017)

### Recommendations based on results

Based on the results of the study, the following recommendations are presented:

- In the model development section, the use of modern technologies such as deep learning and advanced

algorithms like XGBoost has contributed to improving predictive models. The FICO Score 10 system, which integrates domain knowledge with these algorithms, has been able to reduce the default prediction error rate by 0.82%. These innovations not only enhance the efficiency of models but also enable managers to use interpretable tools to make decision-making processes more transparent and increase confidence in model results. One of the key aspects of credit risk management is collaboration and compliance with standards. Organizations must have the ability to adapt to global standards and regulatory requirements. For example, HSBC Bank's collaboration in the R3 Corda consortium, which focuses on knowledge exchange in blockchain technology, highlights the importance of convergence with other institutions in mitigating risks. These interactions can not only help improve compliance with global standards but also facilitate the sharing of experiences and information (Harb et al., 2023)

- Meanwhile, the data and information management framework, as the fundamental infrastructure of all processes, plays a crucial role in the success of risk management systems. The use of DCAM models and tools such as knowledge graphs and predictive data mining has been highly effective in reducing analysis time and improving efficiency. A prominent example in this field is J.P. Morgan Bank, which has leveraged the Neo4j platform to reduce the time required for analyzing guarantee relationships (Okpukpara et al., 2023). These innovations also directly contribute to enhancing the accuracy of risk analysis and predictive models. Credit risk management in banks, especially in the digital era, requires leveraging advanced techniques and technologies more than ever before. (Goodhart et al., 2023). Utilizing knowledge management frameworks in this domain not only helps reduce systematic and non-systematic risks but also significantly improves decision-making processes. The interconnections among these frameworks have been effectively integrated, ensuring that each framework plays a fundamental role in various informational and analytical processes. (Cresswell, 2013)

- Risk analysis and identification, as the foundation of other frameworks, provide managers with more reliable forecasts through accurate data and advanced analyses. The development and optimization of models through modern technologies have significantly improved risk prediction accuracy and model performance. Additionally, data and information management, as the primary infrastructure, has ensured the availability of accurate and timely information for analyses and decision-making. Compliance with standards and adherence to regulations have also helped increase trust in analytical processes and mitigate risks. Ultimately, the performance evaluation and monitoring system serves as a continuous feedback tool, leading to ongoing optimization and improvement of all frameworks. (Elia et al., 2023)

- Overall, the adoption of modern approaches in credit risk management can result in an integrated and efficient

system that is resilient to environmental changes and unforeseen challenges. As new technologies continue to evolve, these processes will become increasingly sophisticated and effective. (Umar et al., 2021)

In conclusion, credit risk management in banks, particularly through the utilization of knowledge management frameworks, has significantly enhanced decision-making and risk assessment processes. These frameworks, with their intricate and reciprocal interactions, create a dynamic and integrated ecosystem capable of effectively adapting to environmental changes and emerging challenges. To improve performance in this field, it is recommended that banks seriously consider implementing advanced data analysis systems and artificial intelligence models, especially in risk analysis and predictive model development. Moreover, future research could explore in greater depth the interactions between frameworks at different organizational levels and examine the potential impacts of adopting emerging technologies such as artificial intelligence and blockchain in credit risk management. Additionally, research on improving and standardizing data models and enhancing inter-organizational and global collaboration capabilities in this field could play a significant role in advancing risk management systems.

### Recommendations for future studies

- Integration of Explainable AI in Credit Risk Models  
Future research can focus on developing explainable artificial intelligence (XAI) techniques in credit risk assessment models. By improving model interpretability, financial institutions can enhance transparency, regulatory compliance, and trust in automated decision-making processes.
- Impact of Blockchain on Credit Risk Management  
Investigating the role of blockchain technology in improving credit risk assessment and fraud detection can be valuable. Future studies can explore how decentralized ledgers and smart contracts can enhance data security, reduce fraudulent activities, and improve the accuracy of credit evaluations.
- Comparative Analysis of Risk Assessment Models Across Banking Sectors  
A study comparing the effectiveness of different credit risk assessment models (e.g., traditional statistical models vs. AI-driven models) across various banking sectors and regions can provide insights into the best practices for risk prediction and management.

#### Authors' Contributions

Morteza Safa Bakhsh contributed to the development of the theoretical framework and literature review. Mahmoud Ahmadi Sharif was responsible for statistical analyses. The third author (Sina Nematizadeh) assisted in data collection and organizing the research findings. Mehran Keshtkar Haranaki contributed to editing, refining the manuscript, and aligning it with publication requirements. All authors reviewed and approved the final version of the manuscript.

#### Availability of Data and Materials

The datasets generated or analyzed during the current study can be obtained from the corresponding author on a reasonable request.

#### Conflict of Interest

The author affirms that there are no conflicts of interest related to this study.

### References

- Aminipour, A., Bagheri, A., & Houshmand, M. (2024). Testing the impact of banking financial technology on risk management based on the dynamic panel data approach for the group of banks and financial institutions admitted to the Tehran Stock Exchange. *Agricultural Marketing and Commercialization*, 8(2).
- Amira, E. A., Musiega, M., & Alala, B. O. (2023). Influence of Credit Risk Management on Financial Performance of Commercial Banks in Kenya. *Cradle of Knowledge: African Journal of Educational and Social Science Research (The)*, 11(3), 138–145.
- Baesens, B., & Smedts, K. (2023). Boosting credit risk models. *The British Accounting Review*, 101241.
- Belás, J., Smrcka, L., Gavurova, B., & Dvorsky, J. (2018). The impact of social and economic factors in the credit risk management of SME. *Technological and Economic Development of Economy*, 24(3), 1215–1230.
- Bhattarai, B. P. (2019). Effect of credit risk management on financial performance of commercial banks in Nepal. *European Journal of Accounting, Auditing and Finance Research*, 7(5), 87–103.
- Böhnke, V., Ongena, S., Paraschiv, F., & Reite, E. J. (2022). *Back to the Roots of Internal Credit Risk Models: Why Do Banks' Risk-Weighted Asset Levels Converge over Time?*
- Bülbül, D., Hakenes, H., & Lambert, C. (2019). What influences banks' choice of credit risk management practices? Theory and evidence. *Journal of Financial Stability*, 40, 1–14.
- Chauhan, S., Akhtar, A., & Gupta, A. (2022). Customer experience in digital banking: a review and future research directions. *International Journal of Quality and Service Sciences*, 14(2), 311–348.
- Chen, S., Zhang, Y., & Li, L. (2022). A comparative study of credit risk infection at domestic and abroad based on knowledge map. *Procedia Computer Science*, 199, 215–222.
- Cresswell, J. (2013). Qualitative inquiry & research design: Choosing among five approaches. In.
- Delavar, A. (2017). The effect of moocs instructional design model-based on student's learning and motivation. *Man In India*, 97(11), 115–126.
- Durst, S., Bruns, G., & Henschel, T. (2016). The management of knowledge risks: what do we really know? *International Journal of Knowledge and Systems Science (IJKSS)*, 7(3), 19–29.
- Elia, G., Stefanelli, V., & Ferilli, G. B. (2023). Investigating the role of Fintech in the banking industry: what do we know? *European Journal of Innovation Management*, 26(5), 1365–1393.
- Ferenhof, H. A., Durst, S., & Selig, P. M. (2016). Knowledge Waste & Knowledge Loss-What is it All About? *Navus-Revista de Gestão e Tecnologia*, 6(4), 38–57.
- Flick, U. (2020). Gütekriterien qualitativer Forschung. *Handbuch Qualitative Forschung in der Psychologie: Band 2: Designs und Verfahren*, 247–263.
- Gall, M. D., Gall, J. P., & Borg, W. R. (2017). A Method of the Study. A Cohesion And Coherence On Students' exposition Writing.
- Goodhart, C. A., Tsomocos, D. P., & Wang, X. (2023). Bank credit, inflation, and default risks over an infinite horizon. *Journal of Financial Stability*, 67, 101131.
- Harb, E., El Khoury, R., Mansour, N., & Daou, R. (2023). Risk management and bank performance: evidence from the MENA region. *Journal of Financial Reporting and Accounting*, 21(5), 974–998.
- Jafari Nodoushan, A., & Mousavi, S. S. (2024). Investigating the effect of credit risk and liquidity risk on the efficiency of banks with dynamic data envelopment analysis. *Journal of Investment*

- Knowledge*, 14(53), 51–67.
- Koulafetis, P. (2017). *Modern credit risk management: Theory and practice*. Springer.
- La Torre, M. (2020). *Risk in Banking: Developing a Knowledge Risk Management Framework for Cooperative Credit Banks*. Springer Nature.
- Lin, M. (2022). Innovative risk early warning model under data mining approach in risk assessment of internet credit finance. *Computational Economics*, 59(4), 1443–1464.
- Marcelin, I., Sun, W., Teclezion, M., & Junarsin, E. (2022). Financial inclusion and bank risk-taking: The effect of information sharing. *Finance Research Letters*, 50, 103182.
- Murinde, V., Rizopoulos, E., & Zachariadis, M. (2022). The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International review of financial analysis*, 81, 102103.
- Okpukpara, V., Okpukpara, B. C., Omeje, E. E., Ukwuaba, I. C., & Ogbuakanne, M. (2023). Credit risk management in small-scale farming by formal financial institutions during the COVID-19 era: Nigerian perspective. *Agricultural Finance Review*, 83(3), 377–394.
- Oyegunle, A., Weber, O., & Elalfy, A. (2023). Carbon costs and credit risk in a resource-based economy: carbon cost impact on the Z-score of Canadian TSX 260 companies. *J. Mgmt. & Sustainability*, 13, 187.
- Ranji Jafroodi, N., & Nasrollahi Moghaddam, P. (2020). The impact of perceived social responsibility on emotional commitment based on the mediating role of employee-organization compatibility, organizational identity and perceived organizational support. *Management and Development Process*, 33(3), 71–93.
- Siregar, A. P., Ramzar, A., Ketaren, M. A., & Yahya, M. F. H. (2024). The Role of Tasawuf in Your Approach to Allah Swt. *International Journal of Islamic Studies and Social Sciences*, 1(1), 1–18.
- Umar, M., Ji, X., Mirza, N., & Rahat, B. (2021). The impact of resource curse on banking efficiency: Evidence from twelve oil producing countries. *Resources Policy*, 72, 102080.
- Wen, J., Zhang, Z., Lan, Y., Cui, Z., Cai, J., & Zhang, W. (2023). A survey on federated learning: challenges and applications. *International Journal of Machine Learning and Cybernetics*, 14(2), 513–535.