

The Relationship of Enterprise Risk Management and Financial Performance in the U.S. Banks

Jiayu Fang^{1*}, Norhayati Zakuan², and Hanini Ilyana Che Hashim³

^{1*,2,3}Faculty of Management, Universiti Teknologi Malaysia, 81310, UTM Skudai Malaysia

^{1*}Corresponding Authors Email: fangjiayu@graduate.utm.my

DOI Link: <http://dx.doi.org/10.6007/IJARBS/v15-i12/27271>

Published Date: 14 December 2025

Abstract

Enterprise Risk Management has gained substantial importance in recent years as financial institutions face increasingly complex and dynamic risk environments. In the United States, commercial banks are vital to sustaining economic growth but are particularly vulnerable to credit, liquidity, and market risks due to the inherent volatility of the financial system. This study investigates the impact of Enterprise Risk Management implementation on the financial performance of U.S. banks. Grounded in Agency Theory and guided by the COSO ERM Framework and ISO 31000 principles, the research adopts a positivist philosophy and a deductive research design. An experimental strategy, coupled with a quantitative methodology, facilitates an empirical evaluation of the relationship between risk management practices and financial outcomes. Data were collected through a structured survey of 354 U.S. banks, with senior executives serving as primary respondents. Structural Equation Modelling using Smart PLS 4 was employed to assess the measurement and structural models and to test the research hypotheses. The study offers practical insights into the effectiveness of integrated risk management in enhancing financial performance and informs recommendations for strengthening ERM practices.

Keywords: Enterprise Risk Management, Financial Performance, U.S. Banking Sector, Risk Management, Firm Size

Introduction

Banks and financial institutions are essential to economic development, providing financial services that promote business growth and reduce inequality through financial inclusion (Iqbal & Sami, 2017). Their effectiveness depends heavily on sound risk management, as they are exposed to credit, liquidity, and market risks stemming from macroeconomic, industry-specific, and organizational factors (Bogodistov & Wohlgemuth, 2017).

Enterprise Risk Management (ERM) offers a comprehensive framework for identifying and managing such risks, supporting long-term stability and performance (Riazanova, 2022). Banks are particularly vulnerable due to their core functions—mobilizing deposits and

extending credit—making risk management, especially of credit and liquidity, critical. In the U.S., rising loan-to-deposit ratios highlight growing credit risk, underscoring the importance of ERM (Oko-Odion & Angela, 2025).

ERM has evolved from reactive models to integrated frameworks such as COSO and ISO 31000, which many institutions now adapt to their operational needs (Saleem, Zraat, & Okour, 2019). The COVID-19 pandemic further accelerated the adoption of such frameworks, exposing weaknesses in traditional risk systems.

ERM also enables banks to better respond to technological shifts, globalization, and market competition, all of which influence profitability and stability (Oyewo, 2022; Al-Nimer et al., 2021). Studies show that integrating risk into strategy improves performance (Bogodistov & Wohlgemuth, 2017).

Firm size plays a moderating role in ERM adoption and effectiveness. Larger banks often employ more formal ERM systems due to greater complexity and risk exposure (Gordon et al., 2009; Miloš et al., 2017), while smaller institutions rely on less structured approaches due to resource constraints (Brustbauer, 2016). This study investigates how firm size influences the relationship between ERM and financial performance in U.S. banks.

Despite growing interest in ERM, limited research explores this moderating effect in the banking sector. This study aims to fill that gap by providing both theoretical and practical insights. Grounded in Agency Theory, which emphasizes alignment of interests between principals and agents (Mitnick, 2006), the study draws on COSO (2004) and ISO (2009) frameworks to examine how ERM enhances organizational performance and sustainability (Muslih, 2019).

Literature Review and Hypothesis

Enterprise Risk Management (ERM): Concept and Evolution

Enterprise Risk Management (ERM) has emerged as a comprehensive framework for addressing organizational risks, replacing fragmented, siloed approaches (Beasley, Clune, & Hermanson, 2006). Its adoption has been driven by regulatory bodies, professional associations, and rating agencies, with evidence supporting its positive impact on firm performance (Farrell & Gallagher, 2019; COSO, 2004). The 2008 financial crisis heightened ERM's importance in banking, integrating it into corporate governance and regulatory structures (Van Liebergen, 2017). ERM is now embedded in global regulatory frameworks such as the COSO Framework and the Basel Accords and is reinforced by national laws like the Sarbanes-Oxley Act (Desender, 2009).

Determinants of ERM Implementation and Financial Performance

ERM implementation is measured through ERM Structure, ERM Governance, and ERM Process (Yakob et al., 2020; Al-Nimer et al., 2021; Saeidi et al., 2021). Firm-specific factors (size) also mediate ERM effectiveness (Gordon et al., 2009). Bank performance—crucial to economic stability—is often assessed through profitability metrics such as ROA, ROE, and ROS (Gazi et al., 2021; Ali, 2020). Recent studies advocate a multidimensional evaluation, incorporating measures like cost efficiency and financial returns (Abotsi, 2023). Accordingly,

this study assesses bank performance using total cost, net profit margin, ROS, ROI, ROA, and ROE.

ERM Structures and Financial Performance

An effective ERM structure is fundamental to successful risk management, as it establishes clear responsibilities, standardized procedures, and communication pathways throughout the organization (Aksel, 2009; Saeidi et al., 2021). Such structures embed risk considerations into daily operations and strategic planning, fostering a shared understanding of risk and performance goals (Shad, 2015; Shatnawi et al., 2022). Empirical studies further suggest that strong ERM structures enhance the identification of key risk indicators (KRIs), link them to key performance indicators (KPIs), and improve both operational resilience and financial outcomes (Al-Nimer et al., 2021).

Hypothesis 1 (H1): ERM Structure has a significant effect on the financial performance of U.S. banks.

ERM Governance and Financial Performance

ERM governance is vital for managing complex risks and involves principles such as integration, accountability, and communication (Kulinich, 2023). Key governance mechanisms—such as risk committees, independent board members, and active audit oversight—can enhance risk oversight and ERM effectiveness (Ballester, 2020). The roles of the Risk Management Committee (RMC), Audit Committee (AC), and Chief Risk Officer (CRO) are particularly influential (Daud et al., 2010; Pagach & Warr, 2011). However, findings on the impact of ERM governance on performance are mixed, with some studies reporting positive effects (Muthuveloo & Ping, 2017), while others show limited or no impact (Salaudeen et al., 2018). These inconsistencies may stem from institutional and methodological variations across studies.

Building on Shad and Lai's (2015) framework, this study defines ERM governance across four dimensions: (i) enterprise-wide risk communication, (ii) accountability structures, (iii) compliance risk mitigation, and (iv) compliance cost monitoring.

Hypothesis 2 (H2): ERM Governance has a significant effect on the financial performance of U.S. banks.

ERM Process and Financial Performance

The ERM process encompasses a systematic cycle of risk identification, assessment, treatment, and disclosure, aimed at minimizing uncertainty and securing financial stability. Risk identification involves detecting potential threats to strategic objectives (Sanchez-Cazorla et al., 2016). Risk assessment evaluates the probability and impact of risks and defines tolerance thresholds (Aven, 2019). Risk treatment implements measures to mitigate or transfer risks (Klotz et al., 2019). Risk disclosure ensures transparency and improves stakeholder confidence (Ibrahim & Hussainey, 2019).

By addressing risks through these interconnected stages, firms enhance resilience and long-term performance (Kuritzkes et al., 2003).

Hypothesis 3 (H3): The ERM process has a significant effect on the financial performance of U.S. banks.

Moderating Role of Firm Size between the ERM practice and Financial Performance

Firm size influences the scope and impact of ERM. Larger banks benefit from greater resources and organizational complexity, which support comprehensive ERM adoption (Oluloni, 2024). In contrast, smaller banks may face resource constraints, limiting ERM implementation (Pagach & Warr, 2011). Thus, firm size may condition the relationship between ERM practices and financial performance.

Hypothesis 4 (H4): Firm size moderates the relationship between ERM implementation and the financial performance of U.S. banks.

Research Methodology*Measurement Instrument*

Although data collection for this study is pre-planned, the development of appropriate research instruments is essential to ensure meaningful and valid results. Research instruments serve as the primary tools for analyzing key variables, thereby facilitating accurate inferences (Buriro et al., 2017). This study aims to examine the relationship between Enterprise Risk Management (ERM) practices and the financial performance of U.S. banks. To achieve this, primary data will be collected using a structured questionnaire.

Before designing the questionnaire, it is necessary to identify the relevant constructs to be measured. In addition to core research variables, demographic information will also be collected due to its potential analytical significance.

Based on an extensive literature review, ERM implementation is conceptualized across three main dimensions: ERM structure, ERM governance, and the ERM process. These dimensions together form the basis for assessing the effectiveness of ERM practices. Consequently, the questionnaire will include specific items addressing each dimension of ERM, following the conceptual framework of Shad and Lai (2015).

To ensure systematic measurement, the ERM practices section will incorporate an ERM score, adapted from Florio and Leoni (2017), reflecting the degree of ERM system implementation. The second part of the questionnaire will assess financial performance using modified indicators from Muthuveloo et al. (2017), Calandro and Lane (2006), and Balanced Scorecard (BSC) metrics. Key indicators will include total cost, return on sales, net profit margin, average return on investment, return on assets, and return on equity. All responses will be rated on a five-point Likert scale to allow for the construction of standardized composite scores.

Study Sites and Data Collection

This study targeted a sample of 354 U.S. banks, comprising 56 large banks and 298 Small and medium enterprises. Given the broad geographic distribution and sample size, data were collected via an email-based survey to ensure efficiency and practicality. Compliance officers from each selected bank were contacted initially. Upon receiving consent, questionnaires were emailed with formal instructions for completion and return, ensuring a structured and professional data collection process.

Sample Profile

Demographic and institutional data were obtained from all 354 valid responses. The gender distribution was fairly balanced, with 53.1% male and 46.9% female respondents. Most participants were aged 26–45, with 27.7% in the 26–35 range and 35.6% in the 36–45 range. Other age groups included 8.8% (18–25), 16.9% (46–55), 8.2% (56–64), and 2.8% (65+).

In terms of education, 78.2% held a bachelor's degree, 18.9% a master's, and 2.8% a doctorate. Regarding work experience at their current bank, 31.1% had 6–10 years of service, 26.3% had 11–15 years, 20.6% had 1–5 years, 14.7% had over 15 years, and 7.3% had less than one year. Most executive directors had held their roles for 1–5 years (57.3%) or 6–10 years (34.7%), with fewer having 11–15 years (5.9%) or more than 15 years (2.0%) of tenure.

The majority of responses (84.2%) came from small and intermediate banks, while 15.8% represented large banks (defined as those with total assets above \$1.202 billion). The sample demonstrates wide variation in gender, age, education, and experience, supporting the generalizability of the findings.

Statistical Analysis

To test the hypotheses, the study employed Structural Equation Modeling using Partial Least Squares (PLS-SEM) in SmartPLS 4. Following the two-step approach by Hair et al. (2022), the analysis began with evaluating the measurement model for reliability and validity, followed by the structural model to assess hypothesized relationships. Path coefficients and indicator loadings were tested using bootstrapping procedures (Hair et al., 2022).

A Proposed Conceptual Framework

Based on the reviewed literature and the consequent hypotheses. The following conceptual model was created in figure 1 to explain the link between the study's variables.

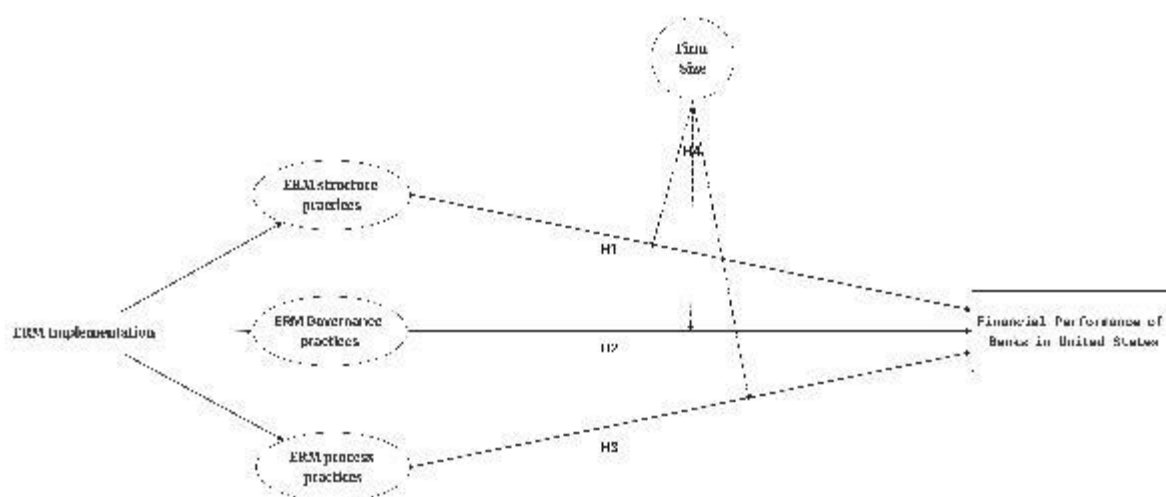


Figure 1. The Proposed Conceptual Framework

Results and Discussions

Evaluating the Measurement Model

The measurement model was evaluated through two steps. It was first necessary to examine reliability and convergent validity for the data; the loading indicators, composite reliability

(CR), and average variance extracted (AVE) should be ≥ 0.5 , ≥ 0.7 , and ≥ 0.5 (Hair et al., 2022), respectively. Table 1 shows that all loading indicators exceeded 0.5, AVE values were greater than 0.5, and CR values were more than 0.7. Reliability and convergent validity were hence adequate for the samples. Discriminant validity was assessed next. Henseler, Ringle, and Sarstedt (2015) stated that acceptable heterotrait-monotrait (HTMT) values should be less than either 0.85 or 0.9; we applied the more rigorous value of 0.85. Table 2 indicates that discriminant validity was acceptable across the data. The “ERM implementation” construct was then converted into a second-order factor, measured using a twostage approach (Sarstedt et al., 2019). In particular, the three dimensions of ERM implementation were transformed into three items to represent this construct. All items’ factor loadings and AVE, CR, and HTMT values were highly acceptable for their corresponding subscales.

Table 1

Measurement Model

US BANKS (N=354)						
Construct	Item	Loading (>0.70)	CR (>0.70)	Cronbach's (>0.70)	Alpha	AVE (>0.50)
ERM Structure	ES1	0.820	0.899	0.860		0.641
	ES2	0.817				
	ES3	0.784				
	ES4	0.788				
	ES5	0.792				
ERM Governance	EG1	0.866	0.889	0.833		0.667
	EG2	0.780				
	EG3	0.822				
	EG4	0.796				
ERM Process	EP1	0.835	0.923	0.906		0.571
	EP2	0.752				
	EP3	0.754				
	EP4	0.711				
	EP5	0.761				
	EP6	0.736				
	EP7	0.747				
	EP8	0.757				
	EP9	0.742				
	ES5	0.792				
Financial Performance	FP1	0.830	0.907	0.876		0.618
	FP2	0.768				
	FP3	0.762				
	FP4	0.767				
	FP5	0.786				
	FP6	0.803				

Table 2

Discriminant Validity (HTMT Ratios)

	ERM Governance	ERM Process	ERM Structure	Financial Performance
ERM Governance				
ERM Process	0.527			
ERM Structure	0.389	0.520		
Financial Performance	0.653	0.696	0.644	

Evaluating the Structural Model

To assess the significance of the structural model paths and obtain robust confidence intervals, this study employed a bootstrapping procedure with 5,000 resamples using the percentile bootstrap method. The structural model of this study contains three direct hypothesized relationships to achieve the first and second aims. These three hypotheses examine the effect of ERM implementation (ERM process dimensions, ERM Governance dimensions, and ERM structure dimensions) on US' financial performance (FP). The direct relationship test was conducted using the Partial Least Squares (PLS) algorithm to obtain path coefficients (β), while significance was assessed via bootstrapping (T-values and P-values, two-tailed). A relationship was considered significant if the P-value was less than 0.05.

All three hypotheses were supported. The path coefficients were statistically significant ($p < 0.05$) with high t-values, confirming a positive relationship between each ERM dimension and financial performance. Specifically, ERM Process exhibited the strongest effect ($\beta = 0.344$, $t = 8.598$), followed by ERM Structure ($\beta = 0.305$, $t = 8.191$) and ERM Governance ($\beta = 0.300$, $t = 7.517$). These findings highlight the critical role of integrated ERM practices in enhancing the financial outcomes of U.S. banks.

Moderation Analysis: The Role of Bank Size

To evaluate whether bank size moderates the relationship between ERM practices and financial performance, a moderation analysis was performed using SmartPLS 4 with bootstrapping (5,000 subsamples). The interaction effects between bank size and each ERM dimension (Size $\times$ ES, Size $\times$ EG, and Size $\times$ EP) were examined.

As indicated in Table 3, none of the interaction terms were statistically significant ($p > 0.05$), suggesting that bank size does not significantly influence the relationship between ERM practices and financial performance in the U.S. banking context. This implies that the benefits of ERM implementation are consistent across both small and large banks.

Table 3

Moderation Effect of Bank Size

Items	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
EG -> FP	0.113	0.116	0.205	0.552	0.581
EP -> FP	0.535	0.535	0.196	2.725	0.006
ES -> FP	0.354	0.362	0.179	1.975	0.048
Size -> FP	-0.051	-0.051	0.102	0.504	0.614
Size x EG -> FP	0.100	0.099	0.109	0.923	0.356
Size x EP -> FP	-0.103	-0.103	0.106	0.975	0.330
Size x ES -> FP	-0.027	-0.031	0.097	0.276	0.783

Predictive Accuracy of the Model

The coefficient of determination (R^2) was used to assess the model's explanatory power. The R^2 value for financial performance was 0.554 (adjusted $R^2 = 0.550$), indicating a moderate level of predictive accuracy based on Chin's (1998) criteria. This suggests that approximately 55% of the variance in financial performance can be explained by the three ERM dimensions.

Effect Size Analysis

Effect size (f^2) was computed to evaluate the individual contribution of each ERM dimension to financial performance. All three ERM components demonstrated medium effect sizes: $f^2 = 0.181$ for ERM Process, $f^2 = 0.160$ for ERM Structure, and $f^2 = 0.156$ for ERM Governance. These results indicate a balanced and moderately strong impact of each ERM dimension on financial performance.

Conclusions

This study investigated the impact of Enterprise Risk Management (ERM) implementation—across its three dimensions: ERM structure, ERM governance, and ERM process—on the financial performance of banks in the United States. Utilizing a survey-based approach and robust statistical methods, including PLS-SEM, the results revealed that all three ERM dimensions had a significant and positive influence on financial performance. Notably, the ERM process dimension showed the strongest impact. Additionally, the moderating role of bank size was found to be statistically insignificant, suggesting that the positive effects of ERM practices are consistent across different bank sizes.

References

- Abotsi, L. A., Umagu, U. B., Ayanbeshishie, S. A., & Effiong, S. A. (2023). Inventory management and financial performance: Efficiency level investigation of listed food & beverage manufacturing companies. *Resmilitaris*, 13(2), 4853-4863.
- Aksel, D. B., & İçduygu, A. (2019). Borders and the Mobility of Migrants in Turkey. *Ceaseval Research*.
- Ali, A., & Faisal, S. (2020). Capital structure and financial performance: A case of Saudi petrochemical industry. *The Journal of Asian Finance, Economics and Business*, 7(7), 105-112.
- Al-Nimer, M., Abbad, S. S., Al-Omush, A., & Ahmad, H. (2021). Risk management practices and firm performance with a mediating role of business model innovation. *Observations from Jordan. Journal of Risk and Financial Management*, 14(3), 113.
- Aven, T., & Thekdi, S. (2019). *Enterprise risk management: Advances on its foundation and practice*. Routledge.
- Ballester, L., González-Urteaga, A., & Martínez, B. (2020). The role of internal corporate governance mechanisms on default risk: A systematic review for different institutional settings. *Research in International Business and Finance*, 54, 101293.
- Beasley, M. S., Clune, R., & Hermanson, D. (2006). The impact of enterprise risk management on the internal audit function.
- Bogodistov, Y., & Wohlgemuth, V. (2017). Enterprise risk management: a capability-based perspective. *The Journal of Risk Finance*, 18(3), 234-251.
- Brustbauer, J. (2016). Enterprise risk management in SMEs: Towards a structural model. *International Small Business Journal*, 34(1), 70-85.
- Buriro, A. G., Awan, J. H., & Lanjwani, A. R. (2017). Interview: a research instrument for social science researchers. *IJSSHE-International Journal of Social Sciences, Humanities and Education*, 1(4), 1-14.
- Calandro Jr, J., & Lane, S. (2006). An introduction to the enterprise risk scorecard. *Measuring Business Excellence*, 10(3), 31-40.
- Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS quarterly*, vii-xvi.
- COSO. (2004). *Enterprise risk management - integrated framework*. Committee of Sponsoring Organizations of the Treadway Commission.
- Daud, W. N. W. D., Yazid, A. S., & Hussin, M. R. (2010). The effect of chief risk officer (CRO) on enterprise risk management (ERM) practices: Evidence from Malaysia. *International Business & Economics Research Journal (IBER)*, 9(11).
- Desender, K., & Lafuente, E. (2009). The influence of board composition, audit fees and ownership concentration on enterprise risk management. *SSRN Electronic Journal*, 12, 1-40.
- Farrell, M., & Gallagher, R. (2019). Moderating influences on the ERM maturity-performance relationship. *Research in International Business and Finance*, 47, 616-628.
- Florio, C., & Leoni, G. (2017). Enterprise risk management and firm performance: The Italian case. *The British Accounting Review*, 49(1), 56-74.
- Gazi, A. (2021). *The implications of early exercise policies for option and stock returns*. The University of Manchester (United Kingdom).
- Gordon, L. A., Loeb, M. P., & Tseng, C. Y. (2009). Enterprise risk management and firm performance: A contingency perspective. *Journal of Accounting and Public Policy*, 28(4), 301-327.

- Hair, J., & Alamer, A. (2022). Partial least squares structural equation modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43, 115-135.
- Ibrahim, A. E. A., & Hussainey, K. (2019). Developing the narrative risk disclosure measurement. *International Review of Financial Analysis*, 64, 126-144.
- Iqbal, B. A., & Sami, S. (2017). Role of banks in financial inclusion in India. *Contaduría y administración*, 62(2), 644-656.
- Klotz, L., Havla, J., Schwab, N., Hohlfeld, R., Barnett, M., Reddel, S., & Wiendl, H. (2019). Risks and risk management in modern multiple sclerosis immunotherapeutic treatment. *Therapeutic Advances in Neurological Disorders*, 12, 1756286419836571.
- Kulinich, T., Andrushko, R., Prosovykh, O., Sterniyuk, O., & Tymchyna, Y. (2023). Enterprise risk management in an uncertain environment. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, 8(4), 47.
- Kuritzkes, A., Schuermann, T., & Weiner, S. M. (2003). Risk measurement, risk management, and capital adequacy in financial conglomerates. *Brookings-Wharton Papers on Financial Services*, 2003(1), 141-193.
- Miloš Sprčić, D., Kožul, A., & Pecina, E. (2017). Managers' support—a key driver behind enterprise risk management maturity. *Zagreb international review of economics & business*, 20(SCI), 25-39.
- Mitnick, B. M. (2006). Origin of the theory of agency. *An account by one of the Theory's Originators*, 1(1), 32-46.
- Muslih, M. (2019). The benefit of enterprise risk management (ERM) on firm performance. *Indonesian Management and Accounting Research*, 17(2), 168-185.
- Muthuveloo, R., Chiek, K. C., & Ping, T. A. (2017). An empirical analysis of the perceived skills in predicting managerial effectiveness: the Malaysian perspective. *Global Business and Management Research*, 9(4s), 41-59.
- Oko-Odion, C., & Angela, O. (2025). Risk management frameworks for financial institutions in a rapidly changing economic landscape. *Int J Sci Res Arch*, 14(1), 1182-1204.
- Oluloni, T. (2024). Erm strategies for navigating financial stress: lessons from us commercial banks. *Finance & Accounting Research Journal*, 6(10), 1861-1880.
- Oyewo, B. (2022). Enterprise risk management and sustainability of banks performance. *Journal of Accounting in Emerging Economies*, 12(2), 318-344.
- Pagach, D., & Warr, R. (2011). The characteristics of firms that hire chief risk officers. *Journal of risk and insurance*, 78(1), 185-211.
- Riazanova, N. O. (2022). Formation of the risk management system at industrial enterprises. *Academic review*, (1), 56.
- Saeidi, P., Saeidi, S. P., Gutierrez, L., Streimikiene, D., Alrasheedi, M., Saeidi, S. P., & Mardani, A. (2021). The influence of enterprise risk management on firm performance with the moderating effect of intellectual capital dimensions. *Economic Research-Ekonomska Istraživanja*, 34(1), 122-151.
- Salaudeen, Y. M., Atoyebi, T. A., & Oyegbile, B. A. (2018). Enterprise risk management and performance of selected listed consumer goods companies in Nigeria. *Applied Finance and Accounting*, 4(1), 112-121.

- Saleem, K. S. A., Zraqat, O. M., & Okour, S. M. (2019). The effect of internal audit quality (IAQ) on enterprise risk management (ERM) in accordance to COSO framework. *European Journal of scientific research*, 152(2), 177-188.
- Sanchez-Cazorla, A., Alfalla-Luque, R., & Irimia-Dieguez, A. I. (2016). Risk identification in megaprojects as a crucial phase of risk management: A literature review. *Project Management Journal*, 47(6), 75-93.
- Sarbanes, P. (2002, July). Sarbanes-oxley act of 2002. In *The Public Company Accounting Reform and Investor Protection Act*. Washington DC: US Congress (Vol. 55).
- Sarstedt, M., Hair Jr, J. F., Cheah, J. H., Becker, J. M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal*, 27(3), 197-211.
- Shad, M. K., & Lai, F. W. (2015). A conceptual framework for enterprise risk management performance measure through economic value added.
- Shatnawi, S. A., Marei, A., Hanefah, M. M., Eldaia, M., & Alaaraj, S. (2022). The effect of audit committee on financial performance of listed companies in Jordan: The moderating effect of enterprise risk management. *Journal of Management Information & Decision Sciences*, 25(2), 1-10.
- Standards Australia/Standards New Zealand Standard Committee. (2009). *AS/NZS ISO 31000: 2009 Risk Management—Principles and Guidelines*. Standards Australia/Standards New Zealand Standard Committee, Sidney.
- Van Liebergen, B. (2017). Machine learning: A revolution in risk management and compliance?. *Journal of Financial Transformation*, 45, 60-67.
- Yakob, S., Syah BAM, H., Yakob, R., & Raziff, N. A. M. (2020). The effect of enterprise risk management practice on SME performance. *The South East Asian Journal of Management*, 13(2), 7.