Information Management and Business Review (ISSN 2220-3796)
Vol. 17, No. 3(S), pp. 237-245, 2025

Enterprise Risk Management Maturity in Malaysia's Banking Industry: A Conceptual Assessment

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Abstract: Enterprise Risk Management (ERM) has emerged as a critical framework for ensuring the stability, resilience, and long-term sustainability of financial institutions. In Malaysia, the banking industry has made significant progress in embedding ERM, guided by Bank Negara Malaysia (BNM) regulatory frameworks and global best practices. However, the maturity of ERM practices varies across institutions, particularly in areas such as governance, culture, risk reporting, and technology adoption. The objective of this concept paper is to design an integrated framework to assess the ERM maturity of the Malaysian banking industry. This concept paper proposes an integrated ERM maturity assessment by examining ten key dimensions that reflect compliance with international standards and regulatory requirements. Findings are expected to provide insights for regulators, policymakers, and banking institutions to strengthen ERM practices, support sustainable financial growth, and stay resilient.

Keywords: *Enterprise Risk Management, ERM maturity, risk assessment, banking industry.*

1. Introduction and Background

The Malaysian banking industry plays a central role in supporting economic growth and financial stability. However, banks face increasing complexity and volatility arising from global economic shifts, digital transformation, cyber threats, and stringent regulatory requirements. The Malaysian banking industry operates in an increasingly complex and volatile environment shaped by globalization, digitalization, regulatory reforms, and emerging risks such as cyber threats and climate change. As financial intermediaries, banks are expected not only to safeguard their institutions but also to maintain public trust and contribute to national financial stability.

The banking industry in Malaysia is required to comply with the Risk-Based Capital Framework and the Internal Capital Adequacy Assessment Process to ensure sound risk management practices and adequate capital levels commensurate with their risk profiles. The Basel III framework, introduced in response to the 2007 global financial crisis, further intensified these requirements by introducing stringent liquidity standards to enhance banking sector stability (Zainudin et al., 2019). The core tenet of these regulations is to ensure that banks maintain sufficient capital buffers to mitigate potential losses from idiosyncratic and systemic risks (Anisa & Sutrisno, 2020). This rigorous regulatory oversight necessitates that financial institutions implement sophisticated risk management practices that extend beyond mere compliance, embedding a proactive risk culture throughout their operations (Rasid & Rahman, 2012).

Given the increasing exposure of Malaysian banks to diverse financial and non-financial risks, assessing ERM maturity is crucial for ensuring competitive risk-adjusted returns on capital and maintaining compliance with prudential guidelines (Vallabh, 2005). This involves a continuous cycle of identification, assessment, mitigation, monitoring, and reporting of all material risks across the enterprise, moving beyond siloed departmental risk functions towards a holistic view (Liu et al., 2013). ERM maturity within the banking sector refers to the sophistication and embeddedness of an institution's risk management frameworks and practices. This encompasses the progression from basic compliance-driven approaches to integrated, strategic risk oversight that actively informs business decisions and value creation (Vij, 2019). A mature ERM framework transcends mere regulatory adherence, establishing a robust system where risk management is intrinsically linked to organizational performance indicators and strategic objectives (Raizada, 2019). This comprehensive approach integrates both internal and external risk considerations, recognizing that effective risk management extends

beyond operational boundaries to encompass broader social and environmental factors (Fitriana & Wardhani, 2020).

The banking sector, in particular, benefits significantly from a high level of ERM maturity given its inherent exposure to diverse and complex financial, operational, and reputational risks, which necessitate a robust and integrated risk management framework to maintain stability and ensure sustained profitability. This heightened emphasis on ERM in the financial sector is further driven by legislative requirements and evolving regulatory frameworks, which mandate sophisticated risk assessment and mitigation strategies (Whittle & Nel-Sanders, 2022). A mature ERM framework enables financial institutions to not only comply with these stringent regulations but also to strategically leverage risk insights for competitive advantage and enhanced decision-making (Sakrabani & Ping, 2022). Additionally, a mature ERM framework fosters a culture of informed risk-taking, allowing banks to strategically pursue opportunities while maintaining financial stability and regulatory compliance

While BNM mandates ERM adoption, there is limited empirical evidence on the maturity of ERM implementation across the sector. A structured evaluation of ERM maturity is therefore critical to determine how well banks are equipped to anticipate and respond to risks, integrate risk considerations into strategy, and build a risk-aware culture. Despite the recognized importance of robust ERM, many institutions, including those in healthcare, often lag in adopting sophisticated approaches, frequently operating at basic to evolving maturity levels (Catalyst, 2018). This disparity underscores a critical need for enhanced understanding and implementation of advanced ERM frameworks across all sectors, particularly in finance, where the implications of insufficient risk management can be widespread and severe (Habib et al., 2014).

Therefore, a deeper exploration into the factors influencing ERM maturity, particularly within the banking sector, is warranted to identify pathways for enhancing risk management capabilities and fostering greater financial resilience. This study aims to address this gap by investigating the critical factors that drive ERM maturity within the banking sector, offering insights into best practices and potential areas for improvement. Despite the growing acknowledgment of ERM's significance, particularly within high-risk sectors such as banking, there remains a notable research gap concerning the precise mechanisms through which its components contribute to overall effectiveness and the institutional, individual, and organizational factors influencing its adoption and maturity (Anton & Nucu, 2020; Bromiley et al., 2014).

This study further investigates the specific factors contributing to ERM maturity within the Malaysian banking industry, identifying both the drivers and impediments to comprehensive risk integration. This paper endeavours to bridge this gap by examining the interplay of these factors to provide a comprehensive understanding of ERM maturity in the banking industry.

2. Literature Review

This section consists of two sections, namely a discussion on the progress of ERM maturity in the Malaysian banking industry and a review of previous studies on the area of ERM maturity.

Evolution of ERM Maturity in the Malaysian Banking Industry

The Malaysian banking industry provides a compelling context for studying ERM maturity, given its proactive stance on ESG developments and the evolving regulatory landscape. This is particularly evident given that Malaysia exhibits a more robust system for ERM research, adoption, practices, and compliance compared to other regional counterparts (Shatnawi et al., 2020). For instance, Malaysia has been at the forefront of encouraging sustainable finance practices, which naturally align with and reinforce the principles of integrated risk management. This regulatory impetus and demonstrated performance link underscore the importance of assessing ERM maturity within the Malaysian banking industry, particularly in understanding how these frameworks are effectively implemented at divisional levels to bridge potential gaps in practice (Abidin et al., 2019).

This progressive regulatory environment, coupled with the industry's exposure to diverse financial risks, necessitates a deep understanding of ERM implementation effectiveness. This unique setting allows for an in-

depth analysis of how Malaysian banks are adapting their ERM frameworks to incorporate sustainability risks and opportunities, thereby enhancing their overall resilience and competitive advantage. Such an examination is crucial given that previous research has highlighted the significant role of sustainability reporting quality in explaining corporate financial performance globally, a finding highly pertinent to the Malaysian context. Moreover, the Malaysian financial landscape, characterized by its status as an emerging market, presents a distinct environment for assessing ERM's value creation, especially in terms of cost savings and revenue enhancement (Chen et al., 2019)

Despite the acknowledged importance of ERM, its implementation and maturity levels can vary significantly across different sectors and regions, often influenced by specific regulatory environments, organizational culture, and resource availability (Habib et al., 2014; Zhao et al., 2015; Vij, 2019). In Malaysia, for instance, nearly half of the listed companies are classified as financially distressed under PN17 and GN3, highlighting a critical need for enhanced corporate financial performance through strategic risk management (ElSayed et al., 2011). This situation underscores the imperative for Malaysian financial institutions to adopt robust ERM frameworks to proactively identify, assess, and mitigate risks, thereby fostering greater resilience and stability within the financial sector. The high proportion of financially distressed companies in Malaysia suggests potential deficiencies in current risk management practices or an inadequate focus on holistic enterprise risk management that integrates financial, operational, and strategic risks.

Furthermore, the prevalence of traditional management accounting practices, focusing primarily on financial performance and budgetary control, within Malaysian financial institutions may limit their ability to comprehensively address emerging risks and adapt to a dynamic economic landscape (Rasid & Rahman, 2012). This highlights a gap in the adoption of more sophisticated ERM methodologies that could encompass a broader spectrum of risks, including non-financial and emerging risks, which are crucial for long-term organizational health and competitiveness (Lima et al., 2019; Syrová & Špička, 2022). Therefore, a comprehensive assessment of ERM maturity within the Malaysian banking industry is essential to identify areas for improvement and guide the development of more resilient financial systems. This assessment would involve evaluating the current risk governance structures, risk identification and measurement techniques, risk monitoring and reporting mechanisms, and the integration of risk insights into strategic decision-making processes.

ERM Maturity Model

ERM Maturity Model, developed by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), offers a framework for organizations to enhance their enterprise risk management processes, though it has been noted for its conceptual abstractness and recent updates aim to improve its applicability (Rubino, 2018). This model emphasizes the integration of risk considerations into strategic planning and performance management, moving beyond traditional compliance-focused approaches to embed risk awareness throughout the enterprise (Zulfitra et al., 2022). The 2017 update to the COSO ERM Framework, specifically, focuses on integrating ERM with strategy-setting and performance, recognizing the crucial roles of governance and culture in this process (Prewett & Terry, 2018). Despite its widespread adoption, the COSO framework often presents challenges in practical implementation due to its high-level guidance, necessitating further research into its operationalization within diverse organizational contexts.

Similarly, the RIMS Risk Maturity Model (RIMS) provides a robust framework for assessing an organization's risk management capabilities across 25 different competency attributes, enabling a granular evaluation of its maturity level and offering actionable insights for advancement. This model allows organizations to benchmark their risk management practices against industry standards and identify specific areas for development, thereby fostering continuous improvement in their ERM capabilities. Although less prescriptive than COSO or RIMS, the Deloitte Risk Intelligence Framework provides a valuable lens through which organizations can understand their risk posture and develop intelligence-driven risk management strategies, emphasizing proactive identification and response to emerging risks (Prasanna & Saidireddy, 2021).

These frameworks, despite their individual nuances, collectively aim to guide organizations towards higher levels of ERM maturity, characterized by comprehensive risk integration and a proactive stance on risk management (Burnaby & Hass, 2009). The convergence of these theoretical frameworks with practical application is crucial for companies to adopt robust risk management practices that move beyond mere

compliance to strategic value creation (Ching & Colombo, 2014). This integration is particularly pertinent given the increasing reliance on data analytics, which introduces complex and decentralized risk environments necessitating updated risk governance frameworks to effectively manage new processing risks. The increasing complexity of global financial relationships, alongside rapid technological advancements and evolving regulatory landscapes, necessitates sophisticated risk management frameworks to ensure continuous organizational resilience and sustainability (Oko-Odion & Angela, 2025). This holistic view of risk management, therefore, extends beyond financial perils to encompass a broader spectrum of operational, strategic, and emergent risks, particularly within a volatile global economic landscape.

3. Conceptual framework of ERM maturity for the banking industry

This section elaborates on the assessment of ERM maturity that consists of ten key dimensions and five levels of ERM maturity. The ERM maturity is assigned based on the ERM maturity index score.

Key Dimensions of ERM Maturity

The maturity of an Enterprise Risk Management framework is often assessed through various dimensions, including the comprehensiveness of its risk identification, assessment, and mitigation processes, as well as its integration with strategic planning and corporate governance. A mature ERM system not only identifies potential risks but also quantifies their impact, enabling organizations to prioritize responses and allocate resources effectively. Furthermore, a high level of ERM maturity signifies a proactive stance towards emerging risks, such as climate change and cybersecurity threats, by embedding these considerations into the organizational strategy and operational workflows, thereby enhancing overall organizational resilience (Mensah & Gottwald, 2016).

Assessing ERM maturity involves evaluating several key dimensions, including risk governance, risk culture, risk appetite, and the integration of risk management into strategic planning and operational processes (Sookye & Mohamudally-Boolaky, 2019). These dimensions collectively determine an organization's capacity to manage risks effectively and proactively respond to an evolving risk landscape. Effective ERM necessitates a comprehensive understanding and strategic alignment of these dimensions to foster organizational resilience and enable sustained value creation. Furthermore, it integrates risk management principles throughout the organization, transforming it from a mere compliance function into a strategic enabler for achieving business objectives (Viscelli et al., 2016; Kaya, 2017).

Based on the integration of the above-mentioned models, this research proposes the key dimensions of risk maturity that consist of ten key dimensions as follows:-

- Risk Governance
- Three Lines of Defence
- Competency of the Risk Management Function
- Risk Appetite, Tolerance, and Targets
- Risk Management Framework, Policies, and Procedures
- Risk Management Tools, Processes, and Assessment Methodology
- Risk Taxonomy and Heatmap
- Risk Reports and Dashboards
- Risk Culture, Awareness, and Continuous Improvement
- Adoption of Technology to Strengthen Risk Management

Risk Governance refers to oversight at the Board and Senior Management Level. Strong risk governance is essential for effective ERM. The Board of Directors holds ultimate accountability for risk oversight, supported by board-level risk committees. Senior management translates board directives into actionable policies. Maturity is reflected in the degree of board engagement, independence of risk committees, and the integration of risk considerations into strategic decision-making.

Three lines of defense reflect accountability and effectiveness within an organization. ERM maturity depends on the clarity and effectiveness of the three lines of defense. The first line represented by business units owning

and managing risk. The second line, represented by risk management and compliance functions, provides oversight. The third line represented by the internal audit provides independent assurance. Mature banks demonstrate well-defined accountability, strong coordination, and effective challenge between these lines.

Competency of the risk management function refers to ERM effectiveness relies on the skills, expertise, and capacity of the risk management function. Current gaps in Malaysia include shortages in specialized areas such as cyber risk, climate risk, and quantitative risk modelling. Moreover, robust cybersecurity practices, which are often immature or underfunded in many businesses, are integral to effective risk management and necessitate a proactive stance against evolving digital threats (Blum, 2020).

Risk appetite, tolerance, and targets should be articulated as a risk appetite statement (RAS) that defines the boundaries within which banks operate. Maturity is reflected in the alignment between risk appetite, tolerance levels, and measurable risk targets. Advanced institutions integrate RAS into capital planning, business performance, and remuneration structures. This integration ensures that risk considerations are embedded in all levels of decision-making, from strategic allocation of resources to individual performance incentives, thereby fostering a holistic risk-aware culture.

ERM maturity requires comprehensive risk management frameworks that are formally documented and regularly updated. Policies and procedures should cover all material risks (credit, market, operational, liquidity, cyber, and ESG-related risks). Maturity is demonstrated when policies are not just regulatory-driven but strategically embedded. Banks employ a variety of tools such as risk registers, stress testing, scenario analysis, and key risk indicators (KRIs). Maturity depends on the sophistication, consistency, and integration of these tools across business units. Advanced practices include forward-looking risk assessments and dynamic stress testing.

A standardized risk taxonomy provides a common language across the bank, ensuring consistency in risk identification and reporting. Risk heatmaps visually prioritize risks based on likelihood and impact. Mature institutions employ dynamic, data-driven taxonomies and real-time risk visualization to guide decision-making. Timely, accurate, and insightful risk reports are critical for decision-making. Mature institutions produce risk dashboards tailored to different stakeholders (board, senior management, business units) with forward-looking indicators. Integration of financial and non-financial risks in reporting is a hallmark of maturity.

A strong risk culture that promotes transparency, accountability, and ethical conduct is detrimental to ERM maturity. Training, awareness campaigns, and tone from the top are crucial. Continuous improvement mechanisms, such as lessons learned from incidents and benchmarking against peers, demonstrate higher maturity. Technological advancement is central to ERM maturity. Malaysian banks are adopting regulatory technology, data analytics, machine learning, and artificial intelligence-driven risk models to enhance monitoring and predictive capabilities. These technological advancements enable more precise risk assessments, improved fraud detection, and a more adaptive regulatory compliance framework, ultimately strengthening the financial sector's resilience against complex and rapidly evolving threats.

Automation of risk reporting and digital dashboards further strengthens efficiency and accuracy. Maturity is demonstrated when technology is fully embedded in risk management processes rather than used as isolated tools. This integration transforms risk management from a reactive function into a proactive, strategic enabler, facilitating quicker and more informed decision-making across the enterprise.

The Five-level ERM maturity

Adapted from COSO and RIMS frameworks, this study adopts a five-level ERM maturity model. The model shows progressive ERM maturity stages, namely initial, developing, defined, managed, and optimized. The following Table 1 depicts the five-level ERM maturity.

Table 1: Five-level ERM maturity

Level	Description
Initial (Ad-hoc/ fragmented)	Risk management activities are unstructured and risks are handled reactively. There is limited awareness of enterprise-wide risk and inconsistent practices. Risk management is siloed by department and limited enterprise-wide perspective.
Developing (Compliance-Oriented)	While basic risk policies and procedures exist, risk activities are primarily driven by regulatory requirements (e.g., BNM compliance).
Defined (Structured/Process-Oriented)	Formalized ERM framework with assigned responsibilities. Governance and policies are in place. Risk appetite is defined but not fully integrated into decision-making.
Managed (Integrated into Business Processes)	ERM is integrated into strategic decision-making and performance management. Risk culture begins to influence business strategy. There exists a culture of proactive risk management.
Optimized (Value-Driven)	ERM is embedded across all levels of the organization. Advanced analytics, scenario planning, and strategic alignment drive value creation. ERM enhances innovation and sustainable growth. Continuous improvement and innovation in risk practices. Dynamic risk appetite and real-time monitoring.

ERM maturity scoring matrix

ERM scoring matrix An ERM scoring matrix provides a standardized framework for assessing the effectiveness and maturity of an organization's enterprise risk management program, typically evaluating various components such as risk identification, assessment, mitigation, and monitoring. This quantitative tool allows organizations to benchmark their current ERM capabilities against industry best practices and identify areas requiring further development or investment. Additionally, such a matrix aids in communicating the overall risk posture to stakeholders and facilitates strategic decision-making by providing clear insights into the organization's risk landscape (Rasid & Rahman, 2012). Moreover, it enables a consistent evaluation across different departments and business units, fostering a unified approach to risk management across the enterprise.

Table 2 depicts the proposed ERM maturity scoring matrix. The assessment of risk maturity is based on a structured assessment, the most commonly used methodology, namely Risk Control Self-Assessment (RCSA). Under the RCSA method, the bank will conduct workshops, surveys, or interviews with business units to evaluate how well risks are identified, assessed, and controlled. The evidence to support the assigned score may include risk registers, control effectiveness testing, audit findings, and compliance reports. The review and validation by internal audit, compliance teams, or an external consultant may reduce the subjectivity of the scores. Specific to banking, the scores may be benchmarked against BNM's regulatory requirements, COSO ERM, and also industry best practices. In addition, Key Risk Indicators (KRIs) and Key Performance Indicators (KPIs) may be considered to support the scoring. For example, low incident rates or strong regulatory compliance may justify higher scores.

Each of the ten keys is scored based on agreed-upon criteria, ranging from initial (score 1) to optimized (score 5). The total score of ERM maturity is calculated by summing the scores across all 10 dimensions. The lowest possible total score is 10 (if all dimensions score 1), and the highest possible total score is 50 (if all dimensions score 5). The ERM maturity index (EMI) is derived by converting the total score into a percentage. The EMI is derived by dividing the total score by the maximum possible score (50) and then multiplying the result by 100. This provides a standardized percentage value, making it easier to compare the ERM maturity levels of different banks. For example, suppose Bank A's ten-dimension scores are 4, 3, 5, 3, 4, 4, 2, 5, 3, 4. Total ERM score = 37 (out of 50). Thus, the EMI is 74%. Based on the following Table 3, Bank A's ERM maturity is assigned at level 4; managed (established). The ERM is integrated into strategic decision-making and performance management. Risk culture begins to influence business strategy and there exists a culture of proactive risk management.

Table 2: ERM Maturity Score

Dimension	Level 1: Initial	Level 2: Developing	Level 3: Defined	Level 4: Managed	Level 5: Optimized
1. Risk governance	No formal board oversight; Risk handled informally	The board reviews risk only for compliance	Risk committee established; periodic reporting	Active board oversight; risk integrated in strategy	The board fully embeds risk in decisions; strong independence and accountability
2. Three lines of defence	Roles unclear, overlaps exist	Basic separation of duties; gaps in execution	Clearly defined accountabilities; reporting lines exist	Effective challenge between lines; strong second line	Fully embedded model; proactive collaboration and assurance
3. Risk function competency	Limited expertise; reactive skills	Basic compliance knowledge	Professional risk staff with standard training	Specialized skills in multiple risk domains	Advanced expertise (cyber, ESG, fintech); strong incentives and career paths
4. Risk appetite and tolerance	No clear statement; reactive limits	Documented risk appetite, compliance-driven	Risk appetite linked to risk registers and limits	Risk appetite integrated with capital planning, business targets	Dynamic risk appetite embedded in decision-making, incentives, and innovation
5. Framework, policies, and procedures	Informal and fragmented	Formal but compliance-focused policies	Documented frameworks covering major risks	Policies are regularly updated, aligned with best practices	Fully integrated across functions, continuous improvement
6. Tools and methodologies	Basic checklists and controls	Risk registers are maintained inconsistently	Stress testing, KRIs, and scenario analysis are in place	Advanced forward-looking tools; dynamic stress testing	Predictive analytics, AI/ML risk models embedded in processes
7. Risk taxonomy and heatmap	Risks described inconsistently	Basic taxonomy, silo-based heatmaps	Standardized taxonomy across functions	Enterprise-wide taxonomy, updated heatmaps	Dynamic, real-time taxonomies and interactive heatmaps
8. Risk reports and dashboards	Irregular, backward-looking reports	Standard reports are submitted periodically	Regular dashboards with key indicators	Integrated reports across financial and non-financial risks	Real-time dashboards, predictive insights for decision-making
9. Risk culture and awareness	Weak culture; risk seen as a compliance burden	Awareness campaigns, but limited buy-in	Defined culture programs, tone from the top	Strong risk culture influences behavior and decision-making	Fully embedded culture, continuous learning, proactive improvement
10 . Technology adoption	Manual processes, spreadsheets	Basic risk systems, isolated tools	Automated systems for core risks	Advanced regulatory technology, integrated data systems	Artificial Intelligence, Machine Learning, predictive analytics, digital dashboards fully embedded

Table 3: The ERM Maturity Index

Level	EMI scores
Initial (Ad-hoc/ fragmented)	0 – 20%
Developing (Compliance-Oriented)	21 % - 40%
Defined (Structured/Process-Oriented)	41% - 60%
Managed (Integrated into Business Processes)	61% - 80%
Optimized (Value-Driven)	81% - 100%

4. Conclusion

ERM maturity in Malaysian banks is progressing, but may remain uneven across institutions. By evaluating governance, processes, culture, tools, and technology, this study aims to provide a holistic assessment that goes beyond compliance, focusing on resilience, strategic alignment, and long-term value creation. While some

financial institutions have made significant strides in adopting advanced risk management technologies and frameworks, others lag, often due to constraints in resources, expertise, or organizational culture. This disparity underscores the necessity for targeted interventions and collaborative efforts within the industry to elevate the overall standard of ERM practices. This uneven maturity highlights the importance of continued regulatory guidance and industry initiatives to foster widespread adoption of best practices, ensuring a more resilient and stable financial ecosystem

ERM emerges as a strategic necessity in Malaysia's banking industry, not merely a compliance requirement. By assessing ERM maturity through surveys, interviews, and content analysis, this study will offer insights into current practices, gaps, and opportunities for growth. The findings will guide banks toward embedding ERM into strategy and culture, thereby enhancing resilience and long-term competitiveness.

References

Abidin, H. Z., Rasid, S. Z. A., Khalid, H., Basiruddin, R., & Baskaran, S. (2019). Effectiveness of Enterprise Risk Management Practices: A Case Study. *Business Management and Strategy*, *10*(2), 213-233. https://doi.org/10.5296/bms.v10i2.15800

Anisa, A., & Sutrisno, S. (2020). Capital Buffer and Determinant Factors of Conventional Banks in Indonesia. *Journal of Asian Finance Economics and Business*, *7*(12), 377-384. https://doi.org/10.13106/jafeb.2020.vol7.no12.377

Anton, S. G., & Nucu, A. E. (2020). Enterprise Risk Management: A Literature Review and Agenda for Future Research. *Journal of Risk and Financial Management*, *13*(11), 281-303. Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/jrfm13110281

Bank Negara Malaysia (2020). *Risk Management in Technology (RMiT) Guidelines*.

Blum, D. (2020). Institute Resilience Through Detection, Response, and Recovery. In *Apress eBooks* (p. 259). https://doi.org/10.1007/978-1-4842-5952-8_9

Burnaby, P., & Hass, S. (2009). Ten steps to enterprise-wide risk management. *Corporate Governance*, *9*(5), 539-550. https://doi.org/10.1108/14720700910998111

Bromiley, P., McShane, M. K., Nair, A., & Rustambekov, E. (2014). Enterprise Risk Management: Review, Critique, and Research Directions. *Long Range Planning*, *48*(4), 265-276. https://doi.org/10.1016/j.lrp.2014.07.005

Catalyst, N. (2018). What Is Risk Management in Healthcare.

Chen, Y., Chuang, Y., Huang, H.-G., & Shih, J.-Y. (2019). The value of implementing enterprise risk management: Evidence from Taiwan's financial industry. *The North American Journal of Economics and Finance*, 54-69. https://doi.org/10.1016/j.najef.2019.02.004

Ching, H. Y., & Colombo, T. M. (2014). Enterprise Risk Management Good Practices and Proposal of Conceptual Framework. *Journal of Management Research*, *6*(3), 69-85. https://doi.org/10.5296/jmr.v6i3.5404

COSO (2017). *Enterprise Risk Management—Integrating with Strategy and Performance*.

Deloitte (2019). *Global Risk Management Survey*.

ElSayed, M., Wickramainghe, A., & Razik, M. A. (2011). The association between strategic cost management and enterprise risk management: A critical literature review. *Corporate Ownership and Control*, *9*(1), 184-195. https://doi.org/10.22495/cocv9i1c1art3

Fitriana, S., & Wardhani, R. (2020). The effect of enterprise risk management and sustainability reporting quality on performance: evidence from Southeast Asia countries. *International Journal of Economic Policy in Emerging Economies*, *13*(4), 344-355. https://doi.org/10.1504/ijepee.2020.109588

Habib, S., Masood, H., Hassan, T., Mubin, M., & Baig, U. (2014). Operational Risk Management in the Corporate and Banking Sector of Pakistan. *Information and Knowledge Management, 4(5).* 58-66.

ISO (2018). *ISO 31000: Risk Management – Guidelines*.

Kaya, İ. (2017). Perspectives on Internal Control and Enterprise Risk Management. In *Eurasian studies in business and economics*, 379-390. https://doi.org/10.1007/978-3-319-67913-6_26

Lima, P. F. de A., Crema, M., & Verbano, C. (2019). Risk management in SMEs: A systematic literature review and future directions. *European Management Journal*, *38*(1), 78-94. https://doi.org/10.1016/j.emj.2019.06.005

Liu, J. Y., Zou, P. X. W., & Gong, W. (2013). Managing Project Risk at the Enterprise Level: Exploratory Case Studies in China. *Journal of Construction Engineering and Management*, *139*(9), 1268-

1274. https://doi.org/10.1061/(asce)co.1943-7862.0000717

Mensah, G., & Gottwald, W. D. (2016). Enterprise risk management: Factors associated with effective implementation. *Risk Governance and Control Financial Markets & Institutions*, *6*(4), 175-206. https://doi.org/10.22495/rcgv6i4c1art9

Oko-Odion, C., & Angela, O. (2025). Risk management frameworks for financial institutions in a rapidly changing economic landscape. *International Journal of Science and Research Archive*, *14*(1), 1182-1204. https://doi.org/10.30574/ijsra.2025.14.1.0155

Prasanna, B. L., & Saidireddy, M. (2021).: Cyber Security Maturity Model for Risk Assessment Using Risk Register for Threat Intelligence. *Journal of Physics Conference Series*, *2040*(1), 13-24. https://doi.org/10.1088/1742-6596/2040/1/012005

Prewett, K. W., & Terry, A. (2018). COSO's Updated Enterprise Risk Management Framework—A Quest For Depth And Clarity. *Journal of Corporate Accounting & Finance*, *29*(3), 16-23. https://doi.org/10.1002/jcaf.22346

Rashid, M. A. A., Zakaria, S., Azizah, A., & Ridzuan, A. R. (2021). Capital Adequacy Challenges in Facing Economic Conflicts in Banking Institutions. *International Journal of Academic Research in Business and Social Sciences*, *11*(8). 678-686. https://doi.org/10.6007/ijarbss/v11-i8/10183

Rasid, S. Z. A., & Rahman, A. R. A. (2012). Management Accounting and Risk Management Practices In Financial Institutions. *Jurnal Teknologi*. 89-110. https://doi.org/10.11113/jt.v51.159

Raizada, S. (2019). Employee Relationship Management: Key to Organizational Growth. *Business Management and Strategy*, *10*(1), 167-180. https://doi.org/10.5296/bms.v10i1.14951

RIMS (2015). *Risk Maturity Model for Enterprise Risk Management*.

Rubino, M. (2018). A Comparison of the Main ERM Frameworks: How Limitations and Weaknesses can be Overcome by Implementing IT Governance. *International Journal of Business and Management*, *13*(12), 203-214. https://doi.org/10.5539/ijbm.v13n12p203

Rubino, M., & Vitolla, F. (2014). Corporate governance and the information system: how a framework for IT governance supports ERM. *Corporate Governance*, *14*(3), 320-330. https://doi.org/10.1108/cg-06-2013-0067

Sakrabani, P., & Ping, T. A. (2022). Enterprise Risk Management: A review of two decades. *Journal of Information Systems and Technology Management*, *7*(27), 76-84. https://doi.org/10.35631/jistm.727006

Shatnawi, S. A., Hanefah, M. M., Anwar, N. A. B. M., & Eldaia, M. (2020). The Factors Influencing the Enterprise Risk Management Practices and Firm Performance in Jordan and Malaysia. *International Journal of Recent Technology and Engineering*, *8*(5), 687-702. https://doi.org/10.35940/ijrte.d8114.018520

Sookye, L., & Mohamudally-Boolaky, A. (2019). Effectiveness of Financial Risk Management Framework: An Analysis of the Mauritian Banking Sector. *Journal of Financial Risk Management*, *8*(2), 106-124. https://doi.org/10.4236/jfrm.2019.82008

Vallabh, G. (2005). Risk-Based Supervision of Banks – Framework for Risk Assessment. *Asia Pacific Business Review*, *1*(1), 26-33. https://doi.org/10.1177/097324700500100104

Vij, M. (2019). The emerging importance of risk management and enterprise risk management strategies in the Indian hospitality industry. *Worldwide Hospitality and Tourism Themes*, *11*(4), 392-403. https://doi.org/10.1108/whatt-04-2019-0023

Viscelli, T. R., Beasley, M. S., & Hermanson, D. R. (2016). Research Insights About Risk Governance. *SAGE Open*, *6*(4), 1-17. https://doi.org/10.1177/2158244016680230

Whittle, C. E., & Nel-Sanders, D. (2022). The regulatory framework for enterprise risk management in South African local government. *Africa's Public Service Delivery and Performance Review*, *10*(1). 610 – 618. https://doi.org/10.4102/apsdpr.v10i1.610

Zainudin, S. M., Rasid, S. Z. A., Omar, R., & Hassan, R. (2019). The Good and Bad News about the New Liquidity Rules of Basel III in Islamic Banking of Malaysia. *Journal of Risk and Financial Management*, *12*(3), 120-139. https://doi.org/10.3390/jrfm12030120

Zhao, X., Hwang, B., & Low, S. P. (2015). Enterprise risk management in international construction firms: drivers and hindrances. *Engineering Construction & Architectural Management*, *22*(3), 347-359. https://doi.org/10.1108/ecam-09-2014-0117

Zulfitra, Z., Ganar, Y. B., Sahroni, S., & Arsyan, M. A. (2022). The Effect of Risk Management and Profitability on Stock Prices Moderated by Good Corporate Governance Variables. *Kontigensi Jurnal Ilmiah Manajemen*, *10*(2), 299-311. https://doi.org/10.56457/jimk.v10i2.288