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Shariah Governance Matters: Analysis of Enterprise Risk Management and Risk Performance in Indonesian Islamic Banks

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ABSTRACT

This study investigates the influence of the five components of the Committee of Sponsoring Organisations of the Treadway Commission Enterprise Risk Management (COSO ERM) framework on bank risk performance. It examines the moderating role of Shariah governance in Indonesian Islamic banks. Using a quantitative cross-sectional approach, data were collected from 180 managers and senior officers of full-fledged Islamic commercial banks and analysed through partial least squares structural equation modelling. The findings show that governance and culture, strategy and objective setting, performance, and information, communication and reporting significantly improve bank risk performance. At the same time, review and revision have no direct significant effect. Shariah governance does not moderate relationships among individual ERM components but strengthens the effect of integrated ERM on risk performance. The study highlights that Shariah governance creates greater value when embedded within enterprise-wide risk management systems, providing implications for boards, regulators, and Islamic banking practitioners.

Keywords: *Enterprise Risk Management, Shariah Governance, Bank Risk Performance, Islamic Banking, PLS-SEM*

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INTRODUCTION

Banks operate through a deliberate acceptance and transformation of risk. Credit intermediation, liquidity provision, maturity transformation, payment services, investment activities, and digital delivery expose banks to financial and non-financial uncertainties that are mutually reinforcing rather than independent. A weakness in operational controls can become a liquidity event; a cyber incident can trigger legal, reputational, and strategic losses; and an inadequately governed credit decision can ultimately impair capital. For this reason, contemporary banking supervision treats risk governance as an integral part of corporate governance rather than a technical function confined solely to a risk department. The Basel Committee on Banking Supervision (2015) consequently emphasises board accountability, effective control functions, transparent information, and sound decision-making. Enterprise risk management (ERM) addresses the same challenge by coordinating risk identification, assessment, response, monitoring, and reporting across the organisation and connecting these activities to strategic objectives and performance.

ERM represents a shift from fragmented, siloed risk control to an enterprise-wide capability. The organisational value of this shift does not arise merely from creating additional procedures; it depends on whether risk information influences strategic choice, capital allocation, product design, operating decisions, incentives, and corrective action. The COSO (2017) framework formalises this integrated view through five components: governance and culture; strategy and objective setting; performance; review and revision; and information, communication and reporting. These components are designed to operate as a coherent system in which oversight and culture establish the behavioural foundation; strategy establishes the boundaries for risk-taking; performance processes identify and respond to threats and opportunities; review supports adaptation; and information systems enable timely escalation and accountability. The framework, therefore, treats ERM as both a governance architecture and a managerial process for creating, preserving, and realising organisational value.

Despite its intuitive appeal, the empirical relationship between ERM and organisational performance remains unsettled. Studies have reported positive associations with firm value, profitability, operational effectiveness, strategic planning, and resilience, but other studies have found weak, context-dependent, or non-significant relationships (Anton & Nucu, 2020; Bromiley et al., 2015; Florio & Leoni, 2017; Hoyt & Liebenberg, 2011; Otero González et al., 2020). One explanation is that ERM is frequently measured as a single disclosure index, the appointment of a chief risk officer, or a composite maturity score. Such aggregate measures are useful for identifying whether ERM exists, yet they reveal little about the organisational mechanisms through which it affects risk outcomes. A bank may have a formal framework yet experience weaknesses in risk culture, strategic alignment, information quality, or follow-through. Conversely, a particular component may appear weak in isolation while remaining essential to the coherence of the wider system.

The problem is especially important in Islamic banking. Islamic banks face conventional banking risks while also being responsible for complying with Shariah principles, including avoiding riba, excessive gharar, and maysir, and maintaining contractual and operational integrity. Their governance architecture, therefore, includes an additional Shariah oversight layer, normally represented by a Shariah supervisory board and supporting compliance and audit functions. This dual governance arrangement can strengthen accountability by adding ethical and jurisprudential scrutiny. However, it can also create coordination problems when Shariah governance is treated as a product-approval or compliance function detached from enterprise-wide risk decisions. Prior literature consequently presents mixed evidence on whether Shariah governance improves financial soundness, risk-taking discipline, and organisational performance (Al Rahahleh et al., 2019; Aslam & Haron, 2020; Hassan et al., 2022; Khalil & Boulila Taktak, 2020; Prasojo et al., 2022).

Indonesia provides a consequential setting for examining these relationships. The country has a large and institutionally diverse Islamic finance sector, dedicated Islamic banking legislation, national Shariah standards, and prudential supervision by the Financial Services Authority. Full-fledged Islamic commercial banks must combine competitive business strategies with risk-based supervision and Shariah compliance. Although industry assets and institutional capacity have expanded, banks continue to differ in scale, digital capability, governance maturity, and risk infrastructure. These differences make it inappropriate to assume that adopting a recognised ERM framework produces uniform results. Indonesian evidence has shown that ERM can strengthen strategic planning, bank performance, soundness, and firm value, but the strength and direction of the relationship vary according to the measurement used and the organisational setting (Adelina et al., 2020; Pratama et al., 2020; Tjun et al., 2022; Wahyuni & Novita, 2021).

A further measurement problem concerns the meaning of bank performance. Many ERM studies use return on assets, return on equity, Tobin's Q, or non-performing financing as dependent variables. These indicators are important, but they are ex post outcomes affected by macroeconomic conditions, business mix, accounting policy, capital structure, and regulatory constraints. ERM operates earlier in the causal chain: it influences how risks are governed, how strategy is aligned with risk appetite, how information is escalated, how controls are applied, and how management responds before losses are crystallised. In a highly regulated industry, process-based bank risk performance can therefore provide a more proximal assessment of ERM effectiveness than accounting ratios alone. The present study defines bank risk performance as the quality of risk governance, strategy alignment, risk infrastructure, risk-management processes, and internal control reflected in informed managerial assessments, consistent with the Indonesian risk-profile approach.

This study addresses three related gaps. First, it estimates the distinct contribution of each COSO ERM component instead of assuming that all components operate with equal force. Second, it tests whether Shariah governance strengthens the relationship between each component and bank risk performance. Third, it conducts a supplementary higher-order analysis in which the five components form an integrated ERM capability. The combination of component-level and higher-order analysis is theoretically important. It enables the study to distinguish between an element that has a unique, direct association with risk performance and one that contributes primarily through system integration. It also allows Shariah governance to be evaluated at two organisational levels: as a potential enhancer of specific ERM processes and as an institutional mechanism that may strengthen the effectiveness of the overall ERM architecture.

Recent developments in integrated Enterprise Risk Management (ERM) demonstrate that banking institutions increasingly require risk frameworks capable of addressing interconnected financial, operational, technological, and strategic uncertainties. Developments highlight the growing importance of digital banking risk management, cyber risk governance, operational resilience, and data-driven risk analytics (Yoewono & Prabowo, 2024). These developments indicate that ERM is no longer limited to traditional control mechanisms but has evolved into an integrated capability that supports organisational adaptation, digital transformation, and resilience. In Islamic banking, this evolution is particularly important because technological advancement must remain aligned with prudential requirements, ethical principles, and Shariah-based governance expectations.

The theoretical explanation of why Shariah governance moderates the relationship between ERM and risk performance can be expanded beyond agency theory. From the perspective of Governance Theory, Shariah governance represents an additional accountability mechanism that strengthens oversight, transparency, and strategic control within Islamic banks (Haryanti et al., 2025). Institutional Theory further explains that Islamic banks operate within a dual institutional environment in which regulatory and Shariah legitimacy jointly influence organisational practices. In addition, the Resource-Based View (RBV) suggests that effective Shariah governance can become a strategic organisational capability by integrating specialised knowledge, ethical values, and governance resources into enterprise-wide risk management processes (Azura et al., 2025). Therefore, Shariah governance is expected to strengthen ERM effectiveness through institutional alignment, knowledge integration, and strategic governance rather than merely through compliance monitoring.

The Indonesian Islamic banking context is unique compared with other Islamic banking jurisdictions, such as Malaysia and the Gulf Cooperation Council (GCC) countries. Indonesia represents one of the largest Muslim populations globally and has developed a distinctive regulatory architecture through the Financial Services Authority (OJK), national Shariah standards, and Shariah Supervisory Boards. Islamic banks in Indonesia must simultaneously pursue competitive growth, comply with prudential banking requirements, manage emerging digital risks, and maintain Shariah legitimacy (Tewu et al., 2024). This institutional complexity makes Indonesia an important context for examining how ERM capability and Shariah governance interact in improving bank risk performance.

To clarify the proposed theoretical relationships, a conceptual framework is developed before hypothesis formulation. The framework positions the five COSO ERM components, namely governance and culture; strategy and objective setting; performance; review and revision; and information, communication and reporting, as forming an integrated Enterprise Risk Management capability (Widjanarko et al., 2025). This integrated capability is expected to improve banks' risk performance, while Shariah governance is positioned as a moderating mechanism that strengthens the relationship between integrated ERM and banks' risk performance.

Accordingly, the study asks: which COSO ERM components are associated with stronger bank risk performance in Indonesian Islamic banks, and under what modelling level does Shariah governance matter? Using survey data from 180 managers and senior officers and partial least squares structural equation modelling (PLS-SEM), the study finds that four components have significant positive direct relationships with bank risk performance, whereas review and revision do not. Shariah governance does not moderate the relationships among the individual components. Nevertheless, integrated ERM is strongly and positively associated with bank risk performance, and Shariah governance significantly strengthens this higher-order relationship. These findings contribute to a more differentiated explanation of ERM effectiveness and offer practical direction for integrating

Shariah oversight with risk governance, strategic planning, risk execution, and information flows.

METHOD

This research used a quantitative, cross-sectional survey design. The design was appropriate because the study examined latent organisational practices that are not fully observable in published reports and because knowledgeable managers can assess the quality of internal governance, risk processes, and information flows. The unit of analysis was the individual manager or senior officer, while the organisational context was the full-fledged Islamic commercial bank operating in Indonesia. The questionnaire was administered electronically through Google Forms. Participation was voluntary, and the questionnaire stated that responses would be confidential and used only for academic purposes. The analysis, therefore, captures informed managerial perceptions at one point in time and does not claim longitudinal causality.

The target population comprised directors, Shariah supervisory board members, division heads, department heads, group heads, executive officers, and other senior personnel working in risk management, finance, business, strategy, compliance, Shariah compliance, audit, operations, treasury, information technology, legal, and related functions. Purposive sampling was used because a valid assessment required knowledge of both internal risk management and the bank's governance environment. Respondents were also expected to possess risk-management certification. The final dataset contained 180 usable responses from full-fledged Islamic commercial banks. This sample exceeded the minimum implied by the ten-times heuristic for the most complex endogenous construct and was considered adequate for PLS-SEM estimation (Hair et al., 2014).

To provide greater transparency in the survey response process, 250 questionnaires were distributed electronically to eligible managers and senior officers at full-fledged Islamic commercial banks in Indonesia. After data screening and completeness assessment, 180 usable responses were retained for analysis, representing a valid response rate of 72%. The final sample size was considered adequate for PLS-SEM estimation and reflected the availability of respondents with sufficient knowledge of enterprise risk management, Shariah governance, and bank risk practices.

Because all variables were collected using self-reported questionnaires from the same respondents, the possibility of common method bias (CMB) was considered. Several procedural remedies were implemented, including ensuring respondent confidentiality, clarifying that there were no right or wrong answers, and reducing apprehension about evaluation during data collection. In addition, a statistical assessment was conducted using Harman's single-factor test and full collinearity assessment through the variance inflation factor (VIF). The results indicated that no single factor dominated the variance and that collinearity values remained below the recommended threshold, suggesting that common method bias was unlikely to substantially affect the findings.

Non-response bias was also considered during data collection. The characteristics of early and late respondents were compared based on key demographic attributes, including managerial position, banking experience, and functional area. No meaningful differences were identified between early and late responses, suggesting that non-response bias was not a significant concern in this study. However, because the research relied on voluntary participation, the possibility of response bias cannot be completely eliminated and is acknowledged as a methodological limitation.

PLS-SEM was selected instead of covariance-based SEM (CB-SEM) because the objective of this study is primarily predictive and explanatory rather than focused on theory confirmation alone. The research model includes multiple latent constructs, a higher-order ERM construct, and moderation analysis involving Shariah governance, which increases model complexity. PLS-SEM is appropriate for analysing complex structural relationships, estimating predictive capability, and examining higher-order constructs, particularly when the research seeks to explain variance in organisational outcomes such as bank risk performance.

The supplementary higher-order model advances a complementary expectation. If the five components jointly constitute an integrated organisational capability, Shariah governance may strengthen the relationship between ERM and risk performance, even if it does not alter the effect of any individual component. This possibility follows from the system character of governance: Shariah oversight may contribute by connecting ethical objectives, product approval, risk information, control, and remediation across the entire framework. Accordingly, the higher-order analysis tests three relationships: the contribution of each component to integrated ERM, the direct relationship between integrated ERM and bank risk performance, and the moderating role of Shariah governance in that overall relationship. Figure 1 presents the first-order conceptual model, while the higher-order analysis is treated as a theoretically motivated robustness and integration test.

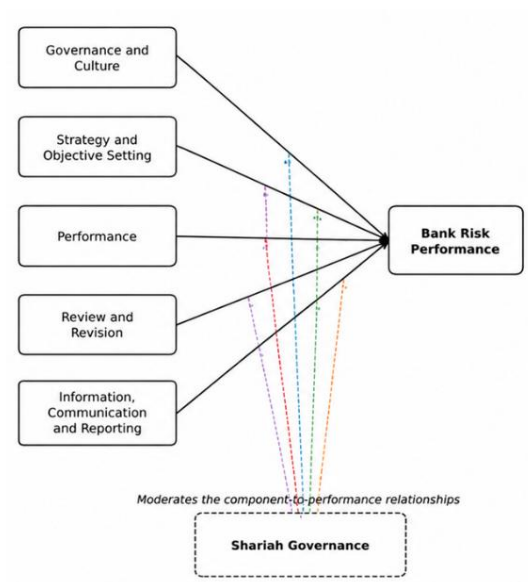

Figure 1. First-Order Conceptual Model of ERM Components, Shariah Governance and Bank Risk Performance

The questionnaire contained 38 substantive statements measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). It was available in English and Indonesian. Governance and culture were measured using five indicators: strategy and objective setting (six); performance (five); review and revision (four); information, communication, and reporting (five); Shariah governance (six); and bank risk performance (seven). The ERM indicators were adapted to the five-component COSO (2017) framework and aligned with Indonesian risk management regulations. Shariah governance captured the structures and processes used to ensure compliance with Islamic principles. Bank risk performance captured risk governance, strategic alignment, infrastructure, risk management processes, and internal control, rather than accounting profitability.

Instrument development included face and content assessment by two risk-management experts and a pilot test before full distribution. The final constructs were specified reflectively because the indicators were treated as manifestations of the underlying organisational practices. Table 1 summarises the constructs and their operational emphasis. The supplementary higher-order ERM construct was modelled from the first five-order COSO components. This specification reflects the proposition that integrated ERM is expressed through the coordinated operation of governance and culture; strategy and objective setting; performance, review, and revision; and information, communication, and reporting.

Table 1: Construct Operationalisation and Number of Indicators

Construct	Items	Operational Emphasis
Governance and culture	5	Board oversight, operating structure, ethical conduct, risk culture and capability
Strategy and objective setting	6	Business context, risk appetite, tolerance, strategic alternatives and aligned objectives
Performance	5	Risk identification, assessment, prioritisation, response and portfolio monitoring
Review and revision	4	Review of ERM effectiveness, substantial change, remediation and continuous improvement
Information, communication and reporting	5	Quality, timeliness, communication, escalation and enterprise risk reporting
Shariah governance	6	Shariah oversight, compliance processes, monitoring, advice and corrective action

Construct	Items	Operational Emphasis
Bank risk performance	7	Risk governance, strategy alignment, infrastructure, processes and internal control

Data analysis was conducted using PLS-SEM in SmartPLS. The procedure followed the two-stage logic recommended for variance-based structural equation modelling: evaluation of the measurement model followed by evaluation of the structural model (Hair et al., 2019). Indicator reliability was assessed through outer loadings. Internal consistency and convergent validity were evaluated using composite reliability and average variance extracted (AVE). Discriminant validity was assessed with the Fornell-Larcker criterion and the heterotrait-monotrait ratio (HTMT), with HTMT values below 0.90 considered satisfactory (Henseler et al., 2015). Collinearity was examined using variance inflation factors. Structural assessment considered standardised path coefficients, bootstrapped t-statistics and p-values, coefficient of determination (R^2), predictive relevance (Q^2), standardised root mean square residual (SRMR), effect sizes, and out-of-sample predictive comparison using PLSpredict.

Two structural specifications were estimated. The primary first-order model assessed the unique direct relationship between each COSO component and bank risk performance, as well as the five interaction effects involving Shariah governance. The supplementary higher-order model treated ERM as an integrated construct and assessed the direct relationships between ERM and bank risk performance, between Shariah governance and bank risk performance, and the ERM × Shariah governance interaction. Statistical significance was assessed at the 5% level. Because the data were cross-sectional and perceptual, coefficients are interpreted as theoretically directed associations rather than definitive causal effects.

FINDING AND DISCUSSION

The empirical analysis provides comprehensive evidence regarding the role of enterprise risk management (ERM) components and Shariah governance in enhancing bank risk performance among Indonesian Islamic banks. The results are presented through a sequential analytical approach, beginning with respondent characteristics, descriptive assessment, and measurement model evaluation, followed by first-order structural relationships and supplementary higher-order ERM analysis. This approach enables a deeper understanding of whether individual COSO ERM components independently contribute to risk performance and whether their collective integration creates stronger organisational capabilities. The findings also examine the extent to which Shariah governance functions as a strengthening mechanism within Islamic banking risk governance.

Table 2 summarises the respondent profile. The sample covered 14 Islamic banks and included personnel from a range of bank categories and functional areas. Senior managers and department heads formed the largest position groups, while business, risk, operations, audit, compliance, and Shariah-related functions were well represented. More than half of the respondents had over 7 years of experience in Islamic banking, and a substantial majority held a bachelor's or master's degree. Risk-management certification was concentrated at levels J4 and J5, with additional representation at J6 and J7. These characteristics support the use of managerial perceptions because most participants had sufficient organisational exposure to evaluate risk governance and performance beyond a single operational task.

Table 2: Summary Profile of Respondents (N = 180)

Characteristic	**Distribution**	**Interpretation**
Bank coverage	14 full-fledged Islamic banks	Broad institutional representation
Position	Senior manager 40.0%; department head 31.1%; group head 12.2%; division head 8.9%	Most respondents occupied senior managerial roles.
Primary functional areas	Business 33.3%; risk 19.4%; operations 12.2%; audit 6.7%; compliance 5.6%	Risk-relevant business and control functions represented
Islamic banking experience	>7 years 51.7%; >3-7 years 24.4%; 1-3 years 20.0%	Three-quarters had more than three years of experience
Education	Bachelor's degree 50.6%; master's degree 34.4%; diploma 8.9%; PhD 6.1%	High level of formal education
Risk certification	J4 45.4%; J5 34.5%; J6 13.2%; J7 6.9%	All respondents reported professional certification

Descriptive statistics indicate generally favourable perceptions of ERM and bank risk performance. Bank risk performance recorded the highest total-scale mean (28.278), followed by Shariah governance (25.494) and strategy and objective setting (23.972). Review and revision had the lowest mean (17.161), although a direct comparison must account for the differing numbers of indicators across scales. The pattern nevertheless suggests that formal Shariah oversight and strategic processes were perceived as relatively established, whereas organisational review and corrective learning were less prominent. Standard deviations were moderate, indicating meaningful but not extreme differences across respondents and institutions. This variation is analytically useful because it permits the structural model to distinguish stronger and weaker implementation environments.

The measurement model met the required reliability and validity criteria. All retained indicator loadings exceeded 0.70, ranging from 0.708 to 0.893. Composite reliability ranged from 0.904 to 0.936, well above the recommended threshold, while AVE ranged from 0.603 to 0.761. The square root of AVE for each construct exceeded its correlations with other constructs, and all HTMT values were below 0.90. The highest reported HTMT value, 0.802, was between performance and bank risk performance and remained within the accepted boundary. These results indicate that the seven constructs were empirically distinguishable despite their conceptual proximity. Collinearity was also acceptable: tolerance values ranged from 0.372 to 0.544 and VIF values from 1.840 to 2.690.

Table 3: Descriptive Statistics and Measurement-Model Quality

Construct	Mean	SD	Composite reliability	AVE
Governance and culture	21.250	3.342	0.935	0.741
Strategy and objective setting	23.972	3.658	0.921	0.660
Performance	20.711	3.115	0.904	0.654
Review and revision	17.161	2.653	0.927	0.761
Information, communication and reporting	20.261	3.738	0.935	0.743
Shariah governance	25.494	3.889	0.936	0.708
Bank risk performance	28.278	3.976	0.914	0.603

The first-order structural model demonstrated substantial explanatory and predictive capacity. The five ERM components explained 69.5% of the variance in bank risk performance ($R^2 = 0.695$). The Stone-Geisser predictive relevance value was positive and moderate ($Q^2 = 0.396$), and SRMR was 0.067, below the conventional 0.08 threshold. In the PLSpredict assessment, the PLS model produced lower root mean square error and mean absolute error than the linear benchmark for all seven bank-risk-performance indicators. Collectively, these statistics indicate that the model was not only explanatory within the estimation sample but also possessed useful predictive capability. The strong R^2 is consistent with the conceptualisation of bank risk performance as a proximal process outcome of ERM rather than a distal accounting measure.

Additional bootstrapping information was incorporated by reporting 95% confidence intervals (CI) for the estimated path coefficients. The confidence interval approach provides a more comprehensive assessment of statistical robustness because it indicates whether the estimated effect range crosses zero. The supported relationships demonstrate confidence intervals that exclude zero, providing additional evidence for the reliability of the structural relationships.

The effect size (f^2) interpretation was standardised across hypothesis discussions. Following PLS-SEM guidelines, f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. Governance and culture showed a small effect ($f^2 = 0.054$); strategy and objective setting showed a small effect ($f^2 = 0.124$); and performance showed a small effect ($f^2 = 0.086$). These findings indicate that each ERM component contributes incremental explanatory value, although their effects should be interpreted within the integrated ERM system rather than independently.

The non-significant relationship of review and revision requires further institutional interpretation. Descriptive evidence indicates that review and revision recorded the lowest mean score among the ERM components (Mean = 17.161), suggesting that continuous evaluation and organisational learning mechanisms may not yet be equally embedded across Islamic banks. In institutional practice, review activities may still be oriented toward periodic compliance requirements rather than systematic learning, corrective action, and strategic adaptation. Therefore, the absence of a direct effect may reflect an implementation-maturity issue rather than a lack of theoretical importance, as confirmed by the higher-order ERM analysis, in which review and revision remained significant contributors to integrated ERM.

Table 4. Summary of Hypothesis Testing and Theoretical Implications

Hypothesis	Relationship	Result	Theoretical Implication
H1	Governance and culture → Bank risk performance	Supported	Confirms that risk culture, ethical values, and governance mechanisms strengthen organisational risk discipline and managerial accountability.
H2	Strategy and objective setting → Bank risk performance	Supported	Demonstrates that ERM generates value when risk considerations are integrated into strategic planning, risk appetite formulation, and organisational objectives.
H3	Performance → Bank risk performance	Supported	Indicates that effective risk identification, assessment, prioritisation, and response processes represent central mechanisms through which ERM improves risk performance.
H4	Review and revision → Bank risk performance	Not supported	Suggests that review mechanisms require stronger institutional learning, corrective action, and remediation processes to translate evaluation activities into improved risk outcomes.
H5	Information, communication and	Supported	Confirms that integrated risk information flows, timely

	reporting → Bank risk performance		communication, and effective reporting systems enhance managerial decision-making and risk oversight.
H6a–H6e	Shariah governance moderation on individual ERM components	Not supported	Indicates that Shariah governance operates more effectively as a systemic governance mechanism that strengthens integrated ERM capability rather than directly enhancing each individual ERM component.

Governance and culture were positively and statistically significantly related to bank risk performance (β = 0.197, t = 2.796, p = 0.006). The result supports H1 and the agency-theory expectation that oversight, accountability, ethical values, and risk awareness reduce information asymmetry and improve the discipline of managerial decisions. The effect size was small (f^2 = 0.054), which is plausible because governance and culture create enabling conditions rather than directly executing every risk response. The finding aligns with evidence that risk governance and dedicated oversight structures can improve bank soundness and risk behaviour (Abid et al., 2021; Jia & Bradbury, 2021). For Islamic banks, the result also implies that formal policies are insufficient without a culture in which staff understand risk ownership and are willing to escalate concerns.

Strategy and objective setting were positively related to bank risk performance (β = 0.213, t = 2.520, p = 0.013), supporting H2. Its effect size (f^2 = 0.124) was the largest among the first-order predictors, even though its standardised path coefficient was lower than the coefficient for performance. This distinction is important: the path coefficient reflects the estimated association, whereas f^2 captures the change in explained variance when the predictor is omitted. The finding suggests that explicit consideration of the business context, risk appetite, tolerance, and strategic alternatives adds unique explanatory value. It is consistent with Wahyuni and Novita (2021), who found that COSO-based ERM supports strategic planning in Islamic banking, and with the contingency view that ERM produces value when it is fitted to organisational strategy (Gordon et al., 2009).

The performance component showed the strongest first-order standardised relationship with bank risk performance (β = 0.324, t = 3.137, p = 0.002), supporting H3. This component covers the practical work of identifying, assessing, prioritising, and responding to risk. The result indicates that bank risk performance improves most visibly when risk governance is translated into operational decisions and portfolio-level actions. Its effect size was small (f^2 = 0.086), reflecting the simultaneous presence of several correlated ERM components. The finding is consistent with evidence that structured risk-management practices improve Islamic bank performance and that integrated risk processes contribute to organisational stability (Alsalami et al., 2023; Fatihin et al., 2024). Managerially, the result prioritises the quality of risk assessment, response selection, escalation, and monitoring over the mere existence of documentation.

Information, communication and reporting also had a positive and significant relationship with bank risk performance ($\beta = 0.253$, $t = 3.022$, $p = 0.003$), supporting H5. Timely risk information enables boards and managers to identify concentrations, challenge assumptions, and coordinate action across business and control functions. The finding supports the information-problem element of agency theory and the organisational literature on ERM implementation, which emphasises communication and visibility across functional boundaries (Arena et al., 2010; Fraser & Simkins, 2016). In Islamic banks, information integration is especially important because Shariah compliance, legal documentation, credit exposure, operational execution, and reputational effects can be distributed across different units. Risk reports must therefore connect Shariah issues to financial and operational consequences rather than presenting them as isolated compliance events.

Review and revision were not significantly and directly related to bank risk performance ($\beta = -0.075$, $t = 1.112$, $p = 0.268$), and H4 was not supported. The absence of a unique direct effect does not mean that the review is unnecessary. Instead, it suggests that existing review activities may be formal, periodic, or compliance-driven and may not translate reliably into changes in policy, systems, incentives, or strategic decisions. The descriptive mean for review and revision was also the lowest among the ERM components. A review process creates value only when findings are prioritised, assigned to accountable owners, resourced, and closed through verified remediation. The result, therefore, points to a potential implementation gap between identifying weaknesses and institutionalising learning. It also anticipates the higher-order finding that review and revision can remain a significant element of integrated ERM even when they do not explain additional variance in bank risk performance after controlling for the other components.

None of the first five-order interaction effects involving Shariah governance was statistically significant. The coefficients were -0.053 for governance and culture ($p = 0.542$), 0.073 for strategy and objective setting ($p = 0.406$), 0.045 for performance ($p = 0.678$), 0.106 for review and revision ($p = 0.241$), and 0.001 for information, communication and reporting ($p = 0.987$). H6a-H6e were therefore not supported. This pattern indicates that higher perceived Shariah governance did not systematically change the marginal relationship between any single ERM component and risk performance. A plausible explanation is functional separation: Shariah governance may be firmly established as an institutional and compliance mechanism, with limited involvement in the detailed operations of individual ERM processes. This interpretation is consistent with research showing that the performance consequences of Shariah governance depend on board competence, information access, independence, and integration rather than formal existence alone (Hassan et al., 2022; Khalil & Boulila Taktak, 2020).

Table 5: First-Order Structural Relationships and Moderation Tests

Structural Path	β	t	p	Decision
Governance and culture → bank risk performance	0.197	2.796	0.006	Supported
Strategy and objective setting → bank risk performance	0.213	2.520	0.013	Supported
Performance → bank risk performance	0.324	3.137	0.002	Supported
Review and revision → bank risk performance	-0.075	1.112	0.268	Not supported
Information, communication and reporting → bank risk performance	0.253	3.022	0.003	Supported
Shariah governance × governance and culture → bank risk performance	-0.053	0.612	0.542	Not supported
Shariah governance × strategy and objective setting → bank risk performance	0.073	0.832	0.406	Not supported
Shariah governance × performance → bank risk performance	0.045	0.416	0.678	Not supported
Shariah governance × review and revision → bank risk performance	0.106	1.176	0.241	Not supported
Shariah governance × information, communication and reporting → bank risk performance	0.001	0.017	0.987	Not supported

Note. Bootstrapped PLS-SEM results. β = standardised path coefficient. Statistical significance was assessed at $p < .05$.

The supplementary higher-order analysis yielded a different, theoretically important result. Integrated ERM had a strong positive relationship with bank risk performance ($\beta = 0.776$, $t = 9.014$, $p < 0.001$). All five components contributed significantly to the higher-order construct: information, communication and reporting ($\beta = 0.270$), strategy and objective setting ($\beta = 0.262$), performance ($\beta = 0.239$), governance and culture ($\beta = 0.238$), and review and revision ($\beta = 0.194$), all with $p < 0.001$. Thus, review and revision remained a statistically meaningful constituent of the ERM system despite lacking an independent direct relationship with bank risk performance. This resolves an apparent contradiction by distinguishing unique effects from system contributions. An element can be essential to completing the ERM cycle while adding limited incremental explanatory power when closely related components are included simultaneously.

Shariah governance had a positive direct relationship with bank risk performance in the higher-order model ($\beta = 0.165$, $t = 2.423$, $p = 0.016$). More importantly, the interaction between Shariah governance and integrated ERM was positive and significant (β = 0.170, t = 3.026, p = 0.003). Shariah governance, therefore, strengthened the relationship between ERM as an enterprise-wide capability and bank risk performance. Figure 2 summarises the standardised coefficients. The contrasting results across modelling levels suggest that Shariah governance exerts its greatest influence through alignment and coherence rather than by amplifying one isolated process. It may connect ethical objectives, product governance, risk appetite, information, internal control, and remediation across the institution. This interpretation is compatible with the dual-governance character of Islamic banks and with arguments that Shariah governance should function as an active governance partner rather than a final-stage compliance gate (Hassan et al., 2022; Zainuldin et al., 2018).

Table 6: Supplementary Higher-Order ERM model

Structural path	β	t	p	Result
Integrated ERM → bank risk performance	0.776	9.014	<0.001	Significant
Shariah governance → bank risk performance	0.165	2.423	0.016	Significant
ERM × Shariah governance → bank risk performance	0.170	3.026	0.003	Significant
Governance and culture → integrated ERM	0.238	14.724	<0.001	Significant
Strategy and objective setting → integrated ERM	0.262	15.933	<0.001	Significant
Performance → integrated ERM	0.239	17.084	<0.001	Significant
Review and revision → integrated ERM	0.194	15.568	<0.001	Significant
Information, communication and reporting → integrated ERM	0.270	16.768	<0.001	Significant

Note. All five COSO components contribute significantly to integrated ERM. The interaction term indicates that Shariah governance strengthens the relationship between integrated ERM and bank risk performance.

The higher-order ERM model provides further evidence that the effectiveness of risk management depends on the interaction among its constituent elements rather than on the isolated implementation of individual practices. The significant contribution of all five COSO ERM components confirms that governance and culture, strategy and objective setting, performance, review and revision, and information, communication and reporting collectively form an integrated capability that supports improved bank risk performance. Furthermore, the positive interaction effect indicates that Shariah governance enhances the value generated by integrated ERM by reinforcing consistency between risk decisions, ethical principles, and organisational objectives. Figure 2 illustrates the empirical relationships among the integrated ERM construct, Shariah governance, and bank risk performance, highlighting the strategic role of Shariah governance in strengthening the effectiveness of enterprise-wide risk management.

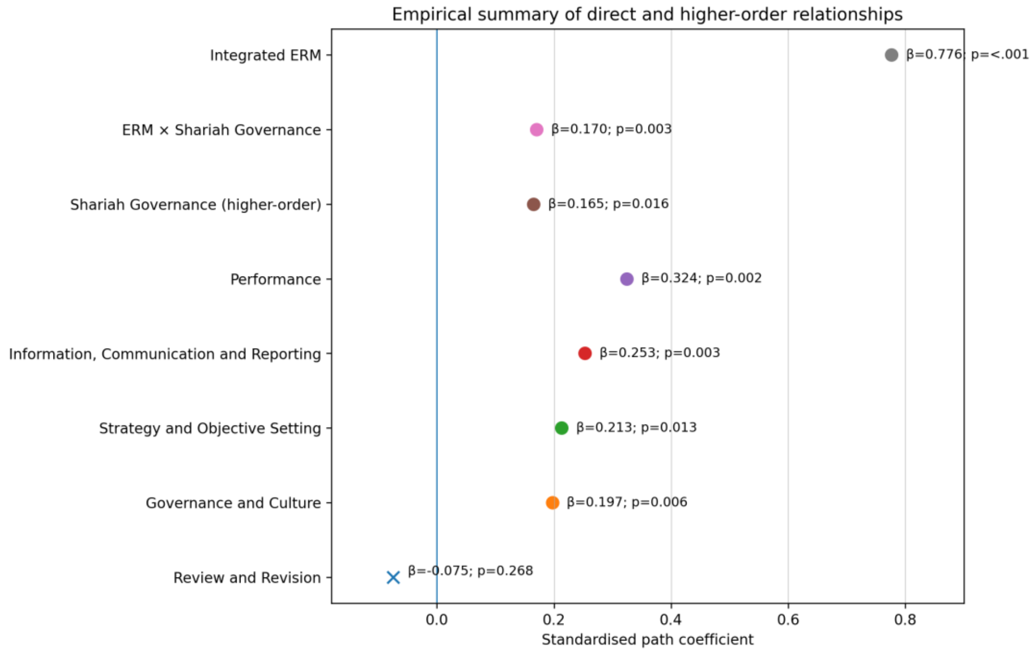

Figure 2. Empirical Summary of Selected First-Order and Higher-Order Path Coefficients.

The study contributes to ERM theory in three ways. First, it demonstrates the value of analysing both components and the integrated system. Aggregate ERM studies can obscure which organisational mechanisms are strongest, while component-only studies can understate the value of system completeness. Second, the findings refine agency-based reasoning. Governance, culture, and information, communication, and reporting are significant because they address monitoring and information asymmetry, but risk performance also depends strongly on the execution of assessments and responses. Third, the results clarify the role of Shariah governance. Its lack of first-order moderation does not imply irrelevance; rather, its significantly higher-order moderation indicates that the level of analysis matters. Governance mechanisms may operate by strengthening organisational architecture and cross-functional alignment instead of changing every bilateral relationship.

The findings provide a deeper theoretical explanation regarding why Shariah governance strengthens integrated ERM but does not significantly moderate individual ERM components. This pattern suggests that Shariah governance operates as a system-level mechanism rather than a direct operational enhancer for each ERM activity. From a Governance Theory perspective, Shariah governance creates alignment among risk oversight, ethical accountability, strategic direction, and organisational control. Therefore, its contribution becomes more visible when ERM components function collectively as an integrated architecture. Institutional Theory further explains that Islamic banks operate within overlapping regulatory and religious legitimacy environments. Shariah governance, therefore, facilitates institutional alignment by ensuring that risk management practices are consistent with both prudential expectations and Islamic ethical principles. From an RBV perspective, Shariah governance represents an organisational capability that combines specialised Shariah knowledge, governance expertise, and decision-making resources, thereby enhancing the overall effectiveness of integrated ERM over individual processes in isolation.

The international relevance of these findings can be understood by comparing Islamic banking practices across different jurisdictions. Islamic banks in Malaysia have developed more formalised Shariah governance structures, supported by established regulatory frameworks, while those in Gulf Cooperation Council (GCC) countries generally operate in environments characterised by strong Shariah supervisory traditions and diverse governance models. Compared with these contexts, Indonesian Islamic banks operate within a rapidly developing Islamic finance ecosystem where regulatory supervision by OJK, Shariah standards, digital transformation, and market expansion occur simultaneously. The findings indicate that regardless of jurisdictional differences, the effectiveness of Shariah governance depends not only on its formal existence but also on its integration with enterprise-wide risk management processes.

Future Islamic banking environments will increasingly require ERM systems that incorporate digital transformation, fintech adoption, and cyber risk management. Digital financial services create new opportunities for efficiency, financial inclusion, and customer accessibility, but they also introduce emerging risks related to cybersecurity, data privacy, technology dependency, and operational disruption. Consequently, integrated ERM should evolve by incorporating technology risk indicators, digital risk monitoring mechanisms, and cyber resilience strategies. For Islamic banks, these developments require maintaining a balance between innovation and Shariah compliance, ensuring that fintech-based services remain aligned with ethical principles, regulatory expectations, and responsible financial practices.

The findings also provide important managerial implications for Shariah Supervisory Boards (SSBs). Rather than functioning only as compliance reviewers, SSBs should be positioned as strategic governance partners within integrated risk management processes. SSBs should actively engage with risk committees, participate in discussions regarding emerging risks, review the Shariah implications of digital products and fintech innovations, and strengthen coordination with risk management, compliance, and internal audit functions. This integrated role enables Shariah governance to contribute not only to compliance assurance but also to organisational resilience, ethical decision-making, and sustainable risk governance.

The practical implications are equally direct. Boards should treat ERM as a strategic operating system and should demand evidence that risk appetite affects planning, pricing, product design, limits, and capital allocation. Risk executives should prioritise the performance component by improving scenario analysis, portfolio assessment, escalation, and response timeliness. Information systems should integrate financial, operational, compliance, technology, and Shariah risk data to enable management to identify connections and concentrations. Review processes should be redesigned around action closure and verified learning rather than calendar-based compliance. Shariah supervisory boards should receive enterprise risk information, participate in discussions of risk appetite and emerging risk where relevant, and coordinate systematically with risk management, compliance, internal audit, and senior management. Regulators can support this transition by evaluating the functional integration of Shariah governance and ERM rather than relying only on structural checklists.

Overall, this study demonstrates that enterprise risk management contributes most effectively to bank risk performance when implemented as an integrated organisational capability rather than as a collection of independent practices. While governance and culture, strategy and objective setting, performance, and information, communication and reporting independently enhance risk performance, review and revision require stronger organisational learning mechanisms to generate direct benefits. The findings further reveal that Shariah governance becomes more influential when embedded within the broader ERM architecture, strengthening the alignment between risk management processes, ethical oversight, and institutional objectives. Therefore, the central contribution of this study is the clarification that Shariah governance does not merely operate as a compliance mechanism but can serve as a strategic governance element that enhances the effectiveness of enterprise-wide risk management in Islamic banks.

CONCLUSION

This study examined the relationships between the five COSO ERM components, Shariah governance, and bank risk performance in Indonesian Islamic banks. The first-order analysis shows that governance and culture, strategy and objective setting, performance, and information, communication and reporting are positively associated with bank risk performance. Performance has the largest standardised coefficient, while strategy and objective setting have the largest first-order effect size. Review and revision do not have a significant, unique, direct relationship. These results indicate that ERM value is created primarily when governance is translated into strategic boundaries, operational risk decisions, and reliable information flows.

Shariah governance does not moderate the relationships between the individual ERM components and bank risk performance. However, the higher-order results show that integrated ERM has a strong positive relationship with bank risk performance and that Shariah governance both contributes directly and strengthens the overall ERM-performance relationship. The central conclusion is therefore not that Shariah governance is ineffective, but that its effectiveness is systemic. Shariah oversight matters most when it is integrated into the entire risk-governance architecture rather than applied selectively to separate components or product-compliance decisions.

For management, the findings support four priorities: embed risk appetite in strategy and objectives; strengthen the quality of risk identification, assessment, prioritisation, and response; improve enterprise-wide risk information and reporting; and convert review findings into accountable, verified corrective action. Islamic banks should also establish more regular interaction among the board, Shariah supervisory board, risk management, Shariah compliance, internal audit, business functions, and technology teams. Such integration can help ensure that Shariah considerations inform the bank's total risk profile and that financial and operational implications are considered in Shariah governance decisions.

Future research should extend this study through longitudinal approaches that examine how ERM integration and Shariah governance evolve over time and how these changes influence bank risk performance under different economic conditions. Comparative cross-country studies involving Islamic banks across jurisdictions, such as Southeast Asia and the Gulf Cooperation Council countries, are also recommended to examine how variations in regulatory frameworks, Shariah governance structures, and institutional environments shape the effectiveness of integrated ERM. Such research would provide broader international evidence regarding the role of Shariah governance in enterprise-wide risk management.

From a policy perspective, the findings provide important implications for financial regulators, particularly the Indonesian Financial Services Authority (OJK). Regulators may consider encouraging Islamic banks to strengthen integrated risk governance frameworks by ensuring that Shariah oversight is connected with enterprise risk management processes, risk committees, internal audit functions, and strategic decision-making. Regulatory guidance that promotes collaboration between Shariah Supervisory Boards and risk-management structures may support more resilient Islamic banking institutions while maintaining both prudential standards and Shariah compliance.

Theoretically, this study extends the ERM and Shariah governance literature by demonstrating that ERM effectiveness should be understood at both component and system levels. The findings extend conventional ERM perspectives by showing that the value of ERM does not originate solely from individual risk-management practices but from integrating governance, strategic alignment, risk processes, review mechanisms, and information flows into an enterprise-wide capability. Furthermore, the study extends the Shariah governance literature by positioning it not merely as a compliance mechanism but as a strategic governance capability that strengthens the coherence among ethical principles, risk decisions, and organisational objectives. This contribution provides a more nuanced explanation of how Islamic banking institutions can achieve stronger risk performance through the interaction between integrated ERM and Shariah-based governance.

The study is subject to limitations. It uses cross-sectional, self-reported managerial perceptions, so causal claims should be made with caution, and common-source bias cannot be eliminated. Purposive sampling and the focus on full-fledged Indonesian Islamic commercial banks limit generalisability to rural Islamic banks, Islamic windows, and other jurisdictions. Future research should combine perceptual measures with longitudinal risk profiles, loss-event, governance, and financial data; compare countries with different Shariah governance regimes; and examine whether board competence, digital risk infrastructure, risk culture, or Shariah-board engagement explains variation in the higher-order moderation effect. A multi-level design could also test whether individual risk awareness, unit-level practices, and bank-level governance jointly shape risk performance.

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