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The role of enterprise risk management in enhancing the sustainability of Saudi insurance companies under vision 2030

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Abstract

This study explores the role of Enterprise Risk Management (ERM) in enhancing corporate sustainability in Saudi insurance companies under the framework of Saudi Vision 2030. It examines how effective ERM implementation promotes long-term financial and operational sustainability, and how ERM maturity improves performance by mitigating underwriting and operational risks. The study further investigates the moderating effect of corporate governance in strengthening the relationship between ERM practices and organizational sustainability. A descriptive-analytical approach is adopted, combining a theoretical review with an empirical survey of professionals in the Saudi insurance sector. Findings are expected to demonstrate significant positive relationships between ERM implementation and financial sustainability, ERM maturity and operational performance, with corporate governance acting as a reinforcing mediator. By addressing the integrative link between ERM, governance, and sustainability, this research fills a critical gap in the literature and offers practical guidance for policymakers and corporate leaders to embed a risk-aware culture within strategic and operational frameworks, ensuring a balance between growth and long-term resilience.

Keywords: Corporate governance, Enterprise risk management (ERM), Insurance companies, Saudi vision 2030, Sustainability.

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1. Introduction

The global insurance sector has recently experienced profound changes driven by rapid economic and financial developments. These dynamics have compelled financial institutions to adopt robust risk management frameworks to safeguard operations and ensure long-term stability. Enterprise Risk Management (ERM) stands out as a systematic approach to identifying, assessing, and managing risks, thereby enhancing organizational resilience and business

sustainability [1] In Saudi Arabia, the relevance of ERM is magnified under Vision 2030, which emphasizes financial transparency, solvency of insurance companies, and sustainable corporate practices. Corporate sustainability involves maintaining financial, technical, and operational performance while fulfilling social and environmental responsibilities, emerging as a strategic priority for companies seeking growth and credibility [2] Corporate governance plays a central role in directing risk management practices and aligning organizational strategies with sustainability goals and regulatory requirements [3]. This study examines the relationship between ERM and corporate sustainability in Saudi insurance companies, highlighting the mediating role of governance. It proposes an integrated model to enhance financial, technical, and operational sustainability, providing insights for academics and practitioners to strengthen resilience and promote long-term corporate sustainability.

1.1. Section One: Theoretical and Conceptual Methodological Framework of the Study

This study aims to examine the current state of Enterprise Risk Management (ERM) in Saudi insurance companies and evaluate its impact on sustainability using quantitative and statistical methods. A descriptive-analytical approach is employed to explore the nature of the phenomenon, while quantitative analysis is applied to test the relationships between variables based on the proposed research model

2. Problem Statement

The study addresses the limited integration between ERM practices and sustainability requirements within Saudi insurance companies. Although both concepts play a pivotal role in advancing the financial sector in line with Saudi Vision 2030, there is a pressing need to investigate how the effectiveness of ERM implementation influences the achievement of financial and operational sustainability. The ultimate objective is to develop a strategic framework that links risk management practices to sustainable organizational performance

2.1. Main Research Question

To what extent does Enterprise Risk Management (ERM) contribute to achieving financial and operational sustainability in Saudi insurance companies in accordance with the objectives of Saudi Vision 2030?

2.2. Sub-Research Questions

What is the level of ERM implementation in Saudi insurance companies?

What is the nature of the relationship between risk management practices and organizational sustainability?

To what extent does ERM contribute to financial solvency and operational stability?

How do governance mechanisms and risk culture influence the relationship between ERM and sustainability?

3. Scientific and Practical Significance of the Study

3.1. Scientific Significance

Advancing knowledge in Enterprise Risk Management (ERM): The study provides a comprehensive theoretical framework linking ERM, governance, and sustainability, enriching literature on the insurance sector, particularly within the rapidly evolving Saudi context under Vision 2030

Bridging the research gap in Arab and Gulf studies: By examining the relationship between ERM and organizational sustainability with governance as a mediating variable, the study addresses a notable gap in the Saudi insurance sector.

Enhancing theoretical understanding of variable interactions: It offers insights into how ERM interacts with governance to achieve sustainability, contributing to a cohesive theoretical model integrating Stakeholder Theory, Corporate Governance Theory, and Organizational Resilience Theory

Supporting comparative research: The findings enable future comparisons between Saudi practices and those of advanced markets, strengthening Saudi Arabia’s academic contribution to the field.

3.2. Practical Significance

Improving risk management effectiveness: The study provides actionable insights for insurance companies to enhance risk policies, ensuring operational and financial sustainability and optimizing capital allocation per solvency requirements.

Guiding policymakers and regulators: Results assist the Saudi Central Bank and Saudi Insurance Authority in refining governance and regulatory frameworks in alignment with Vision 2030 objectives

Promoting governance and accountability culture: It fosters institutional transparency, accountability, and risk awareness, increasing stakeholder confidence in the Saudi insurance sector

Aligning risk management with national strategy: The study demonstrates how ERM can support the Financial Sector Development Program under Vision 2030, improving institutional resilience against market and regulatory risks.

Providing an applicable model for other sectors: The proposed framework can be adapted to banking, finance, healthcare, and other vital sectors to enhance institutional sustainability across Saudi Arabia

4. Research Objectives

4.1. Main Objective

This study aims to examine the role of Enterprise Risk Management (ERM) in promoting corporate sustainability in Saudi insurance companies within the framework of Saudi Arabia's Vision 2030, while assessing the mediating effect of corporate governance on this relationship.

4.2. Specific Objectives

To assess the extent of ERM implementation in Saudi insurance companies in accordance with international frameworks, such as COSO and ISO 31000, and evaluate their alignment with local regulatory requirements set by the Saudi Central Bank

To analyze the realization of corporate sustainability dimensions—financial, operational, social, and environmental—in Saudi insurance companies, and explore their association with ERM practices

To investigate the impact of ERM on enhancing operational efficiency and financial stability of insurance companies as key indicators of corporate sustainability

To evaluate the mediating role of corporate governance between ERM and corporate sustainability, focusing on aspects such as oversight, transparency, accountability, and decision-making processes

To explore the integrative relationship among ERM, governance, and sustainability within the regulatory context of Vision 2030, contributing to the development of a national model for ERM implementation in the insurance sector.

To provide practical recommendations for policymakers and insurance company managers on leveraging ERM and corporate governance to achieve sustainability objectives and support Vision 2030 initiatives

5. Study Population and Sample

Target Population: All insurance companies operating in Saudi Arabia and registered with the Saudi Insurance Authority

Sample: A purposive sample including executive leaders, risk managers, and financial and operational department personnel within Saudi insurance companies

Proposed Sample Size: Between 150 and 200 respondents, ensuring adequate statistical representation

6. Data Collection Instrument

The primary data collection tool will be a structured questionnaire consisting of three sections:

ERM Implementation: Measuring ERM practices based on COSO [1] framework dimensions: risk identification, risk assessment, risk response, risk monitoring, and risk communication

Corporate Sustainability: Assessing financial and operational sustainability through indicators such as solvency, operational efficiency, premium growth, and claims stability

Regulatory Support and Organizational Culture: Evaluating these factors as mediating variables

7. Statistical Analysis Techniques

Descriptive statistics (means and standard deviations) to profile the variables

Correlation and multiple regression analyses to examine relationships between independent and dependent variables

Path analysis or Structural Equation Modeling (SEM) to estimate direct and indirect effects of ERM on corporate sustainability

Reliability and validity tests using established indicators

8. Study Variables

Table 1.
Study Variables The table demonstrates the integrated nature of the study framework, linking ERM practices, corporate sustainability outcomes, and mediating regulatory and cultural factors. This model underscores the study's focus on understanding how ERM, governance mechanisms, and risk-aware culture collectively contribute to sustainable performance in the Saudi insurance industry.

Variable Type	Variable	Description
independent Variable	Enterprise Risk Management (ERM)	Refers to the degree of implementation of ERM practices based on the COSO framework, which includes identifying potential events, assessing and responding to risks, and continuously monitoring the effectiveness of risk management. This variable represents the company's capability to minimize financial, technical, and operational exposure.
Dependent Variable	corporate Sustainability	defined as the organization's ability to achieve its financial, technical, and operational goals over the long term. It encompasses three key dimensions: financial sustainability (profitability and liquidity), technical sustainability (quality of underwriting and service delivery), and operational sustainability (efficiency and continuity of performance)
Mediating Variable	Regulatory and Risk Culture	Refers to the effectiveness of corporate Regulatory in overseeing risk management and the employees' awareness and shared values regarding risks. This variable mediates the relationship between ERM implementation and sustainability outcomes, as effective governance and a strong risk culture enhance the impact of ERM on corporate sustainability.

9. Study Hypotheses

9.1. Main Hypothesis

Enterprise Risk Management (ERM) practices have a positive effect on the sustainability of Saudi insurance companies under Vision 2030

Sub-Hypothesis (H1) The risk identification process has a positive effect on the sustainability of insurance companies
Sub-Hypothesis (H2) The risk assessment process has a positive effect on the sustainability of insurance companies
Sub-Hypothesis (H3) The risk response process has a positive effect on the sustainability of insurance companies
Sub-Hypothesis (H4) Risk monitoring has a positive effect on the sustainability of insurance companies
Sub-Hypothesis (H5) Risk communication has a positive effect on the sustainability of insurance companies

10. Scope of the Study

Geographical: Insurance companies operating within the Kingdom of Saudi Arabia

Temporal: Field data covering the years 2025–2026

Conceptual: The study focuses on the relationship between ERM and sustainability, without addressing the legal or Sharia-related aspects of insurance

11. Methodology for Presenting Results

Statistical analysis of collected data using SPSS& ANOVA Analysis

Presentation of findings through tables and graphs

Interpretation and discussion of results in the context of prior studies and alignment with Saudi Vision 2030

Section Two: Literature Review

12. Enterprise Risk Management (ERM) Studies

Ahmed and Manab [4]: ERM implementation positively impacts financial performance and reduces operational risks; limited to global financial companies

Florio and Leoni [5]: Active board involvement enhances ERM effectiveness and lowers financial/operational risks; focused only on European firms and ignored governance as a mediator.

Arena, et al. [6]: Integrating ERM into strategy improves decision-making and transparency; did not address the insurance sector or long-term sustainability

Sustainability in Insurance Studies

Epstein and Buhovac [2]: Corporate sustainability improves long-term financial and operational performance; not specific to insurance or risk management

Liu and Anbumozhi [7]: Sustainability integration increases client trust and enhances performance in Asian insurance companies; did not consider Saudi context.

Al-Ghamdi [8]: Sustainability in Saudi insurance companies improves solvency and operational stability; ERM and governance were not examined

Governance and Its Relationship with ERM or Sustainability

Soliman and Ragab [9]: Effective governance improves ERM outcomes; did not link to sustainability in Saudi insurance

Kamarudin, et al. [10]: Risk committees strengthen ERM quality and corporate sustainability; focused on Malaysian firms

Almutairi and Quttainah [11]: Governance reduces risks and increases transparency in Saudi insurance companies; integration with ERM and sustainability not studied

Critical Analysis and Research Gap

Existing research largely treats ERM, sustainability, and governance separately, with few studies examining their integration in the Saudi insurance sector

The role of governance as a mediator between ERM and sustainability is underexplored

There is a clear research gap linking ERM, sustainability, and governance in the context of Saudi Vision 2030

Objective of Current Study: To fill this gap by proposing an integrated model illustrating the relationships among ERM, sustainability, and governance, and providing practical recommendations for Saudi insurance companies

Section Three: Theoretical Framework of the Study

13. Enterprise Risk Management (ERM) Concept and Definition

Enterprise Risk Management (ERM) is a comprehensive, organization-wide process designed to identify, assess, and manage all types of risks that may affect the achievement of an organization's objectives. The process involves all levels of management, including the board of directors, executive management, and employees, with the aim of creating value and minimizing risks within acceptable boundaries, ensuring organizational stability and long-term sustainability [1] Enterprise Risk Management (ERM) is a holistic approach employed across the entire organization to identify, assess, and manage various risks that an organization may encounter in pursuit of its objectives.

In today's complex business environment, where uncertainties abound, ERM plays a pivotal role in providing a structured framework to proactively manage risks. Unlike traditional risk management, which often focuses on specific departments or aspects, ERM considers risks across all parts of an organization, recognizing the interconnectedness of various functions and processes.

The potential benefits of implementing ERM are multifaceted. Beyond identifying existing risks, mitigating risks, and monitoring risks, ERM contributes to strategic planning, ultimately providing organizations with a competitive advantage.

By proactively managing both financial risks and non-financial risks, organizations can enhance decision-making processes, protect their reputation, and ensure business continuity even in the face of unforeseen challenges

13.1. The Need for a Holistic Approach

The increasing need for a holistic, overarching approach to managing risks arises from the interconnected nature of today's financial institutions. Internal and external risks can impact different facets of an organization simultaneously, requiring a coordinated effort to mitigate potential threats.

ERM ensures that risk management is integrated into the strategic planning process, aligning risk management strategies with the organization's overall objective [1]

13.2. Key Objectives of an ERM Framework

An effective ERM framework should achieve the following objectives:

Promote a strong risk culture within a bank so that employees at every level understand their roles and responsibilities in protecting the bank from risk.

Support the bank's strategy by embedding risk considerations into the bank's planning, both day-to-day or operationally and longer-term or strategically.

Develop an appropriate risk governance structure. Risk governance describes a bank's general rules and standards for risk management.

Protect the bank's reputation from significant risks.

Comply with laws and government regulations in the jurisdictions the bank operates in.

Ultimate responsibility for the implementation of an effective ERM framework lies with the Chief Risk Officer of the organization. Before the Global Financial Crisis [12] Chief Risk Officer, or CRO, was a high-level position within a bank or financial institution.

However, the crisis highlighted the critical role of risk management to an even greater degree. Now, CROs are typically C-suite level positions, reflective of the importance of managing risk effectively within a financial services organization.

13.3. The Enterprise Risk Management Process

An Enterprise Risk Management framework consists of the following steps:

13.4. Establish Risk Appetite

All banks have a buffer that protects them if losses in the future turn out to be larger than expected. This buffer, referred to as capital, is finite and limits the risk a bank can take. This limit is the bank's risk capacity.

Once a bank knows its risk capacity, it can define its risk appetite. A bank's risk appetite describes how much of each risk they are prepared to take on. Risk appetite cannot exceed risk capacity.

If the bank takes on too much risk and future losses are more significant than expected, capital is wiped out, and the bank could become insolvent. However, if the bank takes too little risk, it's likely to generate less revenue and income than it would otherwise, resulting in financial underperformance.

13.5. Identify Risks

Risk identification is the basis of risk management in financial institutions. A bank can only manage risk once it's identified.

Identifying risks is an ongoing process as employees and risk managers go about their day-to-day tasks. A formal identification process often happens on an annual basis, however

13.6. Assess Risks

A bank needs to develop assessment criteria to be used by all business areas so that risks can be assessed consistently across the enterprise. Risk assessment has four stages.

An enterprise assesses risks on a standalone basis by ranking risks based on the assessment criteria.

An enterprise assesses how risks interact with each. Risks that seem minor in isolation can combine to cause considerable damage.

Risks then need to be prioritized. It is easier for an enterprise to assess how much risk appetite a risk event consumes once risks are ranked.

The final part of this stage is to determine how likely a risk is to occur and its impact on the enterprise if it does occur.

13.7. Respond to Risk

An enterprise needs to decide on an appropriate response to the risks it has previously identified and assessed.

If the risk has a high impact on the bank, the bank may choose to avoid that risk. This response could be appropriate when there is zero risk appetite for it.

A bank can take steps to reduce either the likelihood or impact of a risk event. If the risk is above a bank's particular risk appetite but still wants to accept some exposure to this risk, reducing risk could be the appropriate response [1].

Risk transfer is the scenario where the bank moves the responsibility of the risk to a third party. Transferring risk does not reduce the likelihood or impact of an event but means the bank is protected from any negative impact of that risk. Hedging is an example of risk transfer.

Banks need to decide which risks they choose to accept. For example, a bank that decides to lend money to a customer has accepted the credit risk associated with this transaction.

13.8. Monitor Risk

An effective monitoring process should assure senior management and the Board of Directors that existing risk controls are in place and employees within the enterprise are following these controls.

Any changes in the likelihood or impact of a risk should be updated in the bank's risk register.

An ERM framework is iterative, meaning once the process is completed, it starts again. Let's look at these steps.

14. Enterprise Risk Management: Challenges and Solutions

While implementing an enterprise risk management framework brings significant advantages, financial organizations may encounter challenges. Common issues include resistance to change, difficulty in quantifying certain risks, and inadequate communication [1].

To overcome these challenges, organizations should foster a risk-aware culture, invest in training programs, and establish clear communication channels. Moreover, integrating an ERM program into the organizational culture ensures that employees at all levels understand the importance of managing risks effectively.

The implementation of Enterprise Risk Management (ERM) in Saudi insurance companies is crucial for achieving corporate sustainability and financial soundness. It enhances the companies' ability to adapt to financial, operational, and strategic risks, improves decision-making quality, increases trust among investors and clients, and ensures compliance with Saudi Central Bank regulations and Vision 2030 objectives [11].

In the global insurance industry, technology is rapidly transforming. The number of blockchain applications for fraud prevention, improve efficiency through process simplification, smart underwriting & digital-first policy administration, record keeping, automated codified payouts etc. will reshape the insurance landscape completely. Insurers increasingly invest in data analytics and initiatives to influence behaviors and costs of health providers. Cyber insurance has emerged as a response to growing number of data breaches worldwide which perceived as one of the leading risks to businesses. At the same time in Saudi Ariba, the contribution of insurance towards country's total GDP remains low as 2.59% (2024: 2.59 %) continuously. So, it may be vital to investigate level of adoption of ERM practices and identifying the impact of those towards performance of insurance companies. Because identification of level of adoption/ way of adoption of ERM practices can be a vital factor to policy makers in case of taking decisions to improve the insurance industry. Therefore, findings of this study will be useful to insurance companies, general public, students and the interested parties of insurance industry as it will offer valuable contributions from both a theoretical and practical perspective (www.ia.gov.sa)

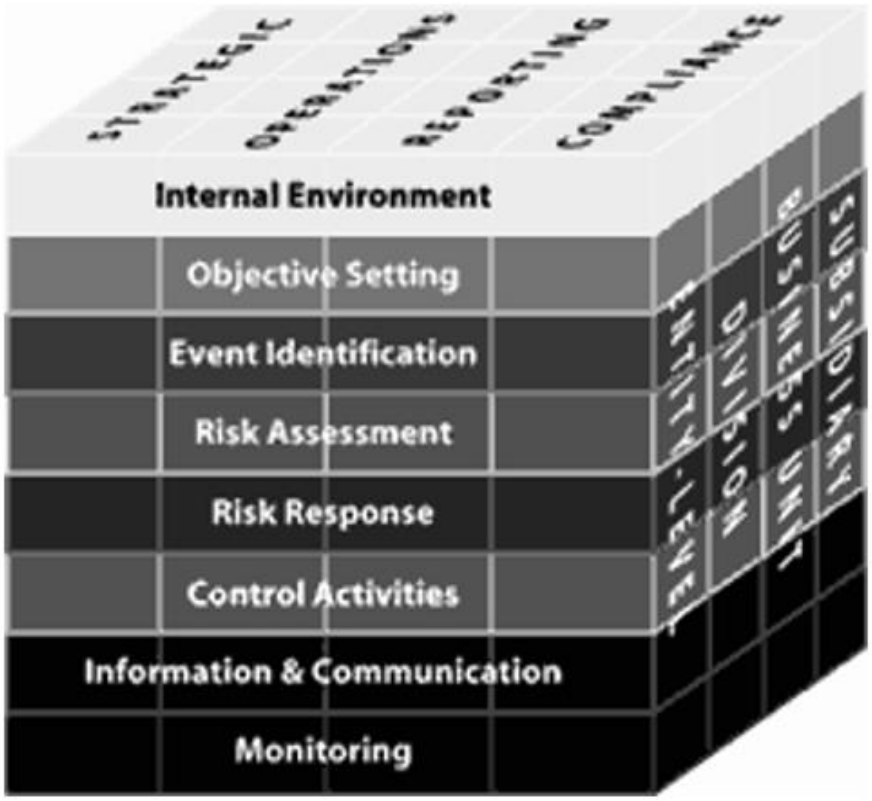

Figure 1.
COSO and ERM Framework.
Source: COSO [1].

14.1. Adopting ERM Enables Companies To

Identify and proactively manage potential risks before they affect operations or financial performance

Enhance operational efficiency and reduce losses from unforeseen events.

Support strategic decision-making by balancing risks and returns

Increase transparency and accountability, in line with corporate governance requirements

14.2. Corporate Sustainability is Defined As

The ability of an organization to achieve sustainable economic and financial growth while maintaining social and environmental responsibilities, ensuring business continuity and creating lasting value for all stakeholders over the long term." [2].

14.3. Brief Explanation

Corporate sustainability integrates financial, operational, social, and environmental dimensions, aiming to embed sustainable practices within strategies and operations to enhance long-term organizational performance

14.4. The Importance of Sustainability for Insurance Companies

Corporate sustainability is considered a fundamental pillar that enhances the competitiveness of insurance companies in the Kingdom of Saudi Arabia. It enables these companies to achieve stable financial performance, improve the management of operational and financial risks, and ensure long-term business continuity. Sustainability also helps in strengthening the trust of clients and investors through adherence to socially and environmentally responsible practices, in alignment with the objectives of Saudi Vision 2030 to build a developed and sustainable financial sector [8].

The importance of sustainability is particularly evident in the insurance sector due to the long-term nature of insurance commitments, where any financial fluctuation or failure in risk management can directly impact the company's solvency and ability to meet obligations to clients and beneficiaries. Therefore, integrating sustainability into corporate strategy contributes to enhancing organizational resilience and achieving sustainable growth

14.5. Corporate Governance in Saudi Insurance Companies

Corporate governance in insurance companies refers to the system that determines how companies are directed and managed to ensure transparency, accountability, and protection of shareholders' and stakeholders' rights. Governance aims to enhance the effectiveness of oversight on strategic, financial, and operational decisions, ensuring compliance with regulatory frameworks issued by authorities such as the Saudi Central Bank while promoting financial solvency and corporate sustainability [11].

In short, corporate governance in the Saudi insurance sector represents a regulatory and supervisory framework that guides corporate practices toward transparency, accountability, and sustainability, ensuring the protection of clients' and shareholders' rights.

15. The Importance of Corporate Governance for Insurance Companies in Saudi Arabia

Enhancing Transparency and Accountability Corporate governance provides a clear framework of responsibilities within insurance companies, improving transparency and accountability among management, shareholders, and stakeholders. This reduces potential financial and operational risks and increases customer and investor confidence in the sector [11] .

Supporting Effective Risk Management Through governance structures, committees and clear procedures are established to monitor risks and ensure that operational policies align with risk management strategies, thereby enhancing financial solvency and institutional stability of insurance companies [9].

Ensuring Regulatory Compliance Corporate governance ensures adherence to the Saudi Central Bank regulations and the Insurance Authority's requirements, enabling companies to comply with local and international laws and reducing the likelihood of violations or penalties [11] .

Promoting Corporate Sustainability Governance links risk management practices to the company's long-term strategy, ensuring financial, operational, social, and environmental sustainability, in line with the objectives of Saudi Vision 2030 [13].

Increasing Investor and Customer Confidence Companies with effective governance achieve higher transparency and credibility, which attracts investment and strengthens customer loyalty—key factors for success in a competitive insurance market [10].

15.1. Concept of Enterprise Risk Management (ERM) Culture

Enterprise Risk Management (ERM) culture refers to the shared values, beliefs, behaviors, and practices within an organization that determine how individuals perceive, assess, and respond to risks. A strong ERM culture is considered essential for the successful implementation of risk management frameworks, as it influences the level of commitment to risk policies and procedures and supports informed decision-making [14].

15.2. Practical Definition

ERM culture is the set of values, practices, attitudes, and behaviors that create an environment conducive to implementing enterprise risk management at all levels of the organization, enhancing risk awareness and encouraging systematic and effective risk handling" [1].

15.3. Key Elements of ERM Culture

Leadership Commitment: Clear support from the board of directors and executive management.

Communication and Transparency: Sharing risk-related information across all organizational levels.

Risk Awareness: Understanding potential risks and their impact on organizational objectives.

Accountability: Clear assignment of responsibilities for risk management.

Continuous Learning and Improvement: Leveraging past experiences to mitigate future risks and improve policies.

15.4. Significance of ERM Culture

Enhances the organization's ability to identify and proactively manage risks.

Ensures alignment between risk policies and strategic objectives.

Improves crisis response and reduces unexpected financial or operational losses.

15.5. Enterprise Risk Management (ERM) Culture and Its Impact on Sustainability in Saudi Insurance Companies

ERM culture is a critical component for the effective implementation of enterprise risk management within financial institutions, especially insurance companies. ERM culture refers to the shared values, beliefs, and practices within an organization that encourage early risk identification and proactive management, thereby supporting organizational goals and long-term sustainability [14]

In the insurance sector, a strong ERM culture significantly enhances corporate sustainability, both financially and operationally, by:

Encouraging employees to adopt preventive practices that minimize potential losses.

Improving strategic decision-making based on a comprehensive understanding of risks.

Enhancing transparency and accountability, thereby increasing stakeholder trust.

Recent studies indicate that organizations with a strong risk management culture achieve higher sustainability and more stable financial and operational performance [15, 16]. In Saudi Arabia, cultivating an ERM culture has become even more crucial under Vision 2030, which emphasizes transparency, corporate governance, and sustainable growth in the insurance sector [11]

15.6. The Relationship Between Enterprise Risk Management, Sustainability, and Governance in Saudi Insurance Companies Insurance companies

In Saudi Arabia represent a critical sector that requires effective risk management to ensure corporate sustainability. Studies indicate that Enterprise Risk Management (ERM) serves as an integrated framework enabling firms to identify, assess, and manage financial, operational, and technical risks systematically [4].

ERM contributes to enhancing corporate sustainability by ensuring financial and operational stability, reducing volatility, improving solvency levels, and strengthening the confidence of investors and clients [2, 8].

Furthermore, corporate governance plays a pivotal role as a regulatory framework that ensures effective implementation of risk management policies and translates risk management outcomes into sustainable strategies. Research has shown that a strong governance structure strengthens the impact of ERM on sustainability, enhancing transparency and accountability [9, 11].

In the Saudi context, Al-Ghamdi [8] indicated that insurance companies integrating ERM with effective governance practices achieved higher levels of corporate sustainability, aligned with the objectives of Saudi Vision 2030. Local studies also emphasized that the integration of ERM and governance improves companies' ability to face operational and financial risks and supports long-term financial and operational stability [11]

Insurance companies in the Kingdom of Saudi Arabia have increasingly adopted Enterprise Risk Management (ERM) practices in line with international standards such as COSO [1] and ISO 31000 [17].

These frameworks aim to systematically identify, assess, and manage risks at the organizational level. According to the Saudi Central Bank and insurance Authority insurance companies are required to implement an integrated risk management framework covering both financial and non-financial risks, ensuring that ERM practices comply with local regulatory requirements.

Studies indicate that implementing ERM according to these international standards enhances financial solvency, operational stability, and reduces exposure to operational and financial risks [11]. Moreover, ERM implementation strengthens corporate governance by clearly defining responsibilities, control mechanisms, and accountability structures, aligning with Saudi Vision 2030 objectives for developing a robust financial and insurance sector [8].

Nevertheless, some insurance companies still face challenges in integrating international standards with insurance Authority local regulations, particularly regarding emerging risks, standardized reporting, and embedding a comprehensive risk culture within the organization

Section Four: Practical Analysis of Data, Hypotheses, Results, and Recommendations

16. Hypotheses Testing

This section represents a fundamental basis upon which scientific studies in general—and the current study in particular—are built. Through this process, the results of the study are obtained, which are grounded in the research hypotheses.

To test the study's hypotheses, the researcher employed Simple Linear Regression, which examines the joint distribution between the independent variable—measured without error and referred to as the Independent Variable (X)—and the dependent variable, which takes values determined by the independent variable and is referred to as the Dependent Variable (Y). In this study, the independent variable represents strategic planning (X), while the dependent variable represents risk management (Y)The results derived from the regression and simple linear correlation tables are interpreted by considering several statistical factors, some of which are outlined below for the reader's better understanding:

Significance of the relationship (sig): Determined by comparing the calculated t-value with the tabulated value (not shown), where the level of significance is considered acceptable if (sig < 0.05).

Correlation coefficient (R): Used to measure the strength and direction of the relationship between the two variables.

Coefficient of determination (R^2): Measures the proportion of variation in the dependent variable that is explained by the independent variable.

t-value: The null hypothesis (which assumes no statistically significant relationship) is rejected if (sig < 0.05), and accepted if (sig > 0.05)

The primary objective of the researcher is to identify the relationships and effects among the study variables through hypothesis testing, as detailed in the following section

16.1. Main Hypothesis

Enterprise Risk Management (ERM) practices have a positive effect on the sustainability of Saudi insurance companies under Vision 2030.

Table 2.
Statistical Indicators of the Impact of ERM Risk Identification on Corporate Sustainability.

Interpretation	Significance Level (p)	Value	statistical Measure
Statistically significant	0.000	0.484	spearman Correlation Coefficient (R)
–	–	0.234	Coefficient of Determination (R^2)
–	–	33.061	Calculated F-value
Statistically significant	0.000	0.491	Regression Coefficient (B)
–	–	5.750	Calculated T-value

Table 2 Presents the relationship between Enterprise Risk Management (ERM) and sustainability in Saudi insurance companies. The value of Spearman's correlation coefficient was (0.484), indicating a significant positive correlation between the two variables. The coefficient of determination ($R^2 = 0.234$) shows that ERM practices explain 23.4% of the variation in the sustainability of insurance companies. Furthermore, the results indicate that the regression coefficient (B = 0.491) is statistically significant at the 0.05 significance level, with a significance value of (0.000). The calculated t-value (5.750) also confirms statistical significance at the 0.05 level (sig = 0.000) Based on these findings, the researcher concludes that there is a statistically significant relationship between Enterprise Risk Management and sustainability. This means that ERM has a positive effect on the sustainability of Saudi insurance companies, thereby supporting the hypothesis that Enterprise Risk Management positively influences the sustainability of insurance companies in the Kingdom of Saudi Arabia.

16.2. Sub-Hypothesis (H_1) The Risk Identification Process Has a Positive Effect on the Sustainability of Insurance Companies

Table 3.
Statistical Measures of the Relationship Between ERM – Risk Identification and Corporate Sustainability.

Relationship between ERM – Risk Identification and Corporate Sustainability			
Interpretation	**Significance Level (p)**	**Value**	**Statistical Measure**
Not statistically significant	0.000	0.405	Spearman Correlation Coefficient (R)
–	–	0.164	Coefficient of Determination (R^2)
–	–	21.206	Calculated F-value
Not statistically significant	0.000	0.388	Regression Coefficient (B)
		4.605	Calculated T-value

Table 3 presents the relationship between the independent variable—Enterprise Risk Management (ERM), specifically the risk identification dimension—and the dependent variable, sustainability. The value of Spearman's correlation coefficient (0.405) indicates a significant positive correlation between risk identification and sustainability. The coefficient of determination ($R^2 = 0.164$) shows that the risk identification dimension alone contributes 16.4% to the sustainability of insurance companies The regression coefficient (B = 0.388) is statistically significant at the 0.05 significance level, with a p-value (sig = 0.000). The calculated t-value (4.605) is also statistically significant at the 0.05 level (sig = 0.000) Based on these findings, the researcher concludes that there is a statistically significant relationship between the principle of risk identification and sustainability. This indicates that risk identification has a positive effect on the sustainability of insurance companies, thus supporting the hypothesis that a statistically significant relationship exists between risk identification and sustainability in Saudi insurance companies.

16.3. Sub-Hypothesis (H2)

The risk assessment process has a positive effect on the sustainability of insurance companies

Table 4.
Statistical Measures of the Relationship Between Enterprise Risk Management (ERM) – Risk Assessment and Corporate Sustainability.

The relationship between Enterprise Risk Management (ERM) – Risk Assessment and Corporate Sustainability			
Interpretation	**Significance Level (p)**	**Value**	**Statistical Measure**
Statistically significant	0.000	0.329	Spearman Correlation Coefficient (R)
–	–	0.108	Coefficient of Determination (R^2)
–	–	13.095	Calculated F-value
Statistically significant	0.000	0.278	Regression Coefficient (B)
–	–	3.619	Calculated T-value

Table 4 presents the relationship between the independent variable—Enterprise Risk Management (ERM), specifically the risk assessment dimension—and the dependent variable, sustainability. The value of Spearman's correlation coefficient (0.329) indicates a significant positive correlation between risk assessment and sustainability. The coefficient of determination ($R^2 = 0.108$) shows that the risk assessment dimension contributes 10.8% to the sustainability of insurance companies The regression coefficient (B = 0.278) is statistically significant at the 0.05 significance level, with a p-value (sig = 0.000). The calculated t-value (3.619) is also statistically significant at the 0.05 level (sig = 0.000) Based on these findings, the researcher concludes that there is a statistically significant relationship between the risk assessment principle and sustainability. This means that effective risk assessment positively impacts the sustainability of insurance companies,

thus supporting the hypothesis that a statistically significant relationship exists between risk assessment and sustainability in Saudi insurance companies.

16.4. Sub-Hypothesis (H3)

The risk response process has a positive effect on the sustainability of insurance companies.

Table 5.
Statistical Measures of the Relationship Between Enterprise Risk Management (ERM) – Risk Response and Corporate Sustainability

The relationship between Enterprise Risk Management (ERM) – Risk Response and Corporate Sustainability.			
Interpretation	**Significance Level (p)**	**Value**	**Statistical Measure**
Statistically significant – –	0.000 – –	0.411	Spearman Correlation Coefficient (R)
		0.169	Coefficient of Determination (R^2)
		21.937	Calculated F-value
Statistically significant –	0.000 –	0.357	Regression Coefficient (B)
		4.684	Calculated T-value

Table 5 presents the relationship between the independent variable—Enterprise Risk Management (ERM), specifically the risk response dimension—and the dependent variable, sustainability. The value of Spearman's correlation coefficient (0.411) indicates a significant positive correlation between risk response and sustainability. The coefficient of determination (R^2 = 0.169) shows that the risk response dimension explains 16.9% of the variation in sustainability The regression coefficient (B = 0.357) is statistically significant at the 0.05 significance level, with a p-value (sig = 0.000). The calculated t-value (4.684) is also statistically significant at the 0.05 level (sig = 0.000) Based on these findings, the researcher concludes that there is a statistically significant relationship between the risk response principle and sustainability. This indicates that enhancing the risk response process positively impacts the sustainability of insurance companies, thereby supporting the hypothesis that a statistically significant relationship exists between risk response and sustainability in Saudi insurance companies.

16.5. Sub-Hypothesis (H4) Risk Monitoring Has a Positive Effect on the Sustainability of Insurance Companies

Table 6.
Statistical Measures of the Relationship Between Enterprise Risk Management (ERM) – Risk Monitoring and Corporate Sustainability

The relationship between Enterprise Risk Management (ERM) – Risk Monitoring and Corporate Sustainability			
Interpretation	**Significance Level (p)**	**Value**	**Statistical Measure**
Statistically significant – –	0.003 – –	0.435	Spearman Correlation Coefficient (R)
		0.189	Coefficient of Determination (R^2)
		25.137	Calculated F-value
Statistically significant –	0.003 –	0.375	Regression Coefficient (B)
		5.014	Calculated T-value

Table 6 presents the relationship between the independent variable—Enterprise Risk Management (ERM), specifically the risk monitoring dimension—and the dependent variable, sustainability. The value of Spearman's correlation coefficient (0.435) indicates a significant positive correlation between risk monitoring and sustainability. The coefficient of determination (R^2 = 0.189) shows that the risk monitoring dimension contributes 18.9% to the sustainability of insurance companies The regression coefficient (B = 0.375) is statistically significant at the 0.05 significance level, with a p-value (sig = 0.000). The calculated t-value (5.014) is also statistically significant at the 0.05 level (sig = 0.000) Based on these results, the researcher concludes that there is a statistically significant relationship between the risk monitoring principle and sustainability. This indicates that effective risk monitoring positively impacts the sustainability of insurance companies, thereby supporting the hypothesis that a statistically significant relationship exists between risk monitoring and sustainability in Saudi insurance companies

16.6. Sub-Hypothesis (H5) Risk Communication Has a Positive Effect on the Sustainability of Insurance Companies

Table 7.
Statistical Measures of the Relationship Between Enterprise Risk Management (ERM) – Risk Communication and Corporate Sustainability.

The relationship between Enterprise Risk Management (ERM) – Risk Communication and Corporate Sustainability.			
Interpretation	**Significance Level (p)**	**Value**	**Statistical Measure**
Statistically significant – –	0.000 – –	0.513	Spearman Correlation Coefficient (R)
		0.264	Coefficient of Determination (R^2)
		38.665	Calculated F-value
Statistically significant –	0.000 –	0.439	Regression Coefficient (B)
		6.218	Calculated T-value

Table 7 presents the relationship between the independent variable—Enterprise Risk Management (ERM), specifically the risk communication dimension—and the dependent variable, sustainability. The value of Spearman's correlation coefficient (0.513) indicates a significant positive correlation between risk communication and sustainability. The coefficient of determination ($R^2 = 0.264$) shows that the risk communication dimension explains 26.4% of the variation in sustainability The regression coefficient (B = 0.439) is statistically significant at the 0.05 significance level, with a p-value (sig = 0.000). The calculated t-value (6.218) is also statistically significant at the 0.05 level (sig = 0.000) Based on these findings, the researcher concludes that there is a statistically significant relationship between the risk communication principle and sustainability. This indicates that enhancing risk communication positively impacts the sustainability of insurance companies, thereby supporting the hypothesis that a statistically significant relationship exists between risk communication and sustainability in Saudi insurance companies.

Regulatory Support mediates the relationship between ERM practices and the sustainability of Saudi insurance companies.

A supportive regulatory framework strengthens insurance companies' commitment to ERM principles based on best practices.

Regulatory support enhances companies' ability to improve reporting and disclosure of risks effectively.

Government policies under Vision 2030 encourage the application of strong governance practices that reinforce sustainability.

Modern legislation provides a stable regulatory environment that enhances ERM effectiveness.

Higher levels of regulatory support increase the potential of ERM practices to create strategic value

Organizational Culture mediates the relationship between ERM practices and the sustainability of Saudi insurance companies.

A culture of transparency and accountability influences the successful implementation of ERM practices.

Positive organizational culture encourages employees to report and respond to risks without fear or resistance.

A supportive culture fosters organizational learning and improves institutional performance over time.

Adopting a shared risk-aware culture instills proactive behaviors that enhance sustainability.

Organizational culture is a key factor determining the effectiveness of COSO framework application within Saudi insurance companies

16.7. Data Collection Instrument

The primary data collection tool will be a structured questionnaire consisting of three sections:

ERM Implementation: Measuring ERM practices based on COSO [1] framework dimensions: risk identification, risk assessment, risk response, risk monitoring, and risk communication

Corporate Sustainability: Assessing financial and operational sustainability through indicators such as solvency, operational efficiency, premium growth, and claims stability

Regulatory Support and Organizational Culture: Evaluating these factors as mediating variables

There is a statistically significant positive relationship between the implementation of Enterprise Risk Management and the level of financial sustainability in Saudi insurance companies

Table 8.
Distribution of Enterprise Risk Management (ERM) Dimensions Based on Frequency and Percentage.

Dimension	Frequency	Percentage (%)	Interpretation
Risk Identification	85	85%	Most companies regularly identify risks
Risk Assessment	80	80%	majority of companies conduct systematic risk assessment
Risk Response	78	78%	A significant number of companies apply effective risk responses
Risk Monitoring	75	75%	Three-quarters of companies monitor risk management strategies
Risk Communication	70	70%	Most companies communicate risk information to management and stakeholder

Table 8 the results indicate that ERM practices are relatively well implemented among Saudi insurance companies, supporting the likelihood of a positive impact on financial sustainability. This finding aligns with Hypothesis which proposes a positive relationship between ERM implementation and corporate financial sustainability

Assessing Corporate Sustainability in Saudi Insurance Companies Dependent Variable: Corporate Sustainability

Description: This variable measures the financial and operational sustainability of insurance companies in Saudi Arabia

Solvency: The company's ability to meet its short- and long-term obligations

Operational Efficiency: The effectiveness of managing resources and minimizing operating costs

Premium Growth: The company's ability to expand its insurance portfolio and maintain market stability

Claims Stability: The consistency of claims management without excessive volatility affecting financial performance or reputation

Table 9.
Distribution of Corporate Sustainability Indicators Based on Frequency and Percentage.

Indicator	Frequency	Percentage (%)	Interpretation
Solvency	82	82%	Most companies maintain adequate solvency levels as per regulatory standards
Operational Efficiency	78	87%	companies demonstrate strong cost control and efficient operations
Premium Growth	80	80%	premium growth indicates market confidence and financial stability
Claims Stability	76	76%	Most companies experience steady claims patterns, reflecting operational stability

The findings suggest that Saudi insurance companies show a high level of financial and operational sustainability, supporting Hypothesis H2, which proposes that the maturity of ERM practices positively influences corporate technical and operational performance The Mediating Role of Governance and Risk Culture Mediating Variable: Governance and Risk Culture Description: This variable measures the effectiveness of corporate governance mechanisms and the maturity of risk culture within insurance companies. It acts as the link between Enterprise Risk Management (ERM) implementation and corporate sustainability outcomes

Table 10.
Distribution of Corporate Governance Dimensions Based on Frequency and Percentage.

Dimension	Frequency	Percentage (%)	Interpretation
Governance Structure	83	83%	Most companies have clear governance structures and active risk committees
Transparency and Disclosure	79	79%	companies regularly disclose risk and compliance information
Risk Culture	81	81%	Most employees demonstrate a strong awareness of ERM principles.
Accountability and Review	77	77%	Firms conduct regular internal reviews and audits on risk management performance

Table 11.
Descriptive Statistics of Study Variables.

Statistics						
	N-(Valid)	**Std. Deviation**	**Skewness**	**Std. Error of Skewness**	**Kurtosis**	**Std. Error of Kurtosis**
Age	150	1.17	0.83	0.192	-0.307	0.381
Gender	150	0.457	-0.914	0.192	-1.179	0.381
Educational Qualification	150	1.48	0.824	0.192	-0.906	0.381
Risk Identification: The company regularly identifies all types of financial, operational, and strategic risks.	150	1.084	0.031	0.192	-0.149	0.381
Risk Assessment: Risks are assessed based on their likelihood of occurrence and impact.	150	1.171	-0.947	0.192	-0.018	0.381
Risk Response: Risk responses are implemented in a timely manner after their assessment	150	1.105	-0.003	0.192	-0.153	0.381
Risk Monitoring A mechanism exists to periodically monitor and review the effectiveness of risk management.	150	1.081	0.106	0.192	-0.009	0.381
Risk Communication Clear communication about risks and related policies is maintained across all management levels	150	1.051	-0.787	0.192	-0.156	0.381
Solvency The company has sufficient capital to cover its short-term and long-term obligations.	150	1.063	-0.147	0.192	-0.021	0.381
Operational Efficiency The company uses its resources efficiently to achieve objectives at the lowest possible cos	150	1.155	-0.926	0.192	-0.264	0.381
Premium The company records a stable or increasing growth rate in the volume of annual premiums	150	1.03	-0.136	0.192	0.212	0.381
Claims Stability The company maintains a stable ratio of claims to premiums	150	1.232	-0.79	0.192	-0.551	0.381
Insurance claims are managed efficiently and fairly to ensure customer satisfaction	150	1.067	0.164	0.192	0.044	0.381
Regulatory Support The regulatory authority provides clear guidelines for implementing enterprise risk management.	150	1.23	-0.853	0.192	-0.496	0.381
The company receives technical or training support from the regulatory bodies.	150	1.048	-0.008	0.192	-0.165	0.381
Regulatory policies help	150	1.16	-0.94	0.192	-0.006	0.381

enhance the stability of the insurance sector.						
Organizational Culture The company's culture encourages adherence to ethical values and accountability	150	1.069	-0.081	0.192	-0.069	0.381
Employees are motivated to adopt risk management practices.	150	1.163	-0.895	0.192	-0.192	0.381

Source: Researcher's analysis based on survey data (N = 150) Prepared by the researcher based on field study data, 2025.

Table 12.
Summary of Case Processing.

Case Processing Summary			
		N	**%**
Cases	Valid	160	100
	Excluded	0	0
	Total	150	100

Note: a. Listwise deletion based on all variables in the procedure.

Table 13.
Reliability and Validity Analysis.

Reliability Statistics		
Cronbach's Alpha[a]	**Cronbach's Alpha Based on Standardized Items[a]**	**N of Items**
0.775	0.771	19

16.8. ANOVA Analysis

The one-way analysis of variance (ANOVA) examines the effect of independent variables on the dependent variable. The study indicated that the total explained variance was 12.130, while the unexplained variance totaled 174.614, giving an overall variance of 186.744. The degrees of freedom were 12 for regression and 147 for residuals, with a total of 159. The mean square for regression was 1.011, while for residuals it was 1.188. However, the F-test value was 0.851, which is not statistically significant, as the probability value (Sig.) was 0.598, exceeding the accepted significance level of 0.05. This indicates that the statistical model is not significant and that there is no significant effect of the independent variables on the dependent variable.

The results showed no evidence supporting the estimated model compared to the null model. The correlation coefficient (R) was weak at 0.255, and the coefficient of determination (R^2) indicated that the independent variables explained only 6.5% of the variance in the dependent variable, which is very low. Additionally, the adjusted R^2 value was -0.011, further confirming that the model is not suitable for assessing the data. The standard error of the estimate was 1.09.

Based on these data, it appears that the model used to evaluate the relationship between the independent and dependent variables is not statistically significant. This demonstrates the limited effect and correlation of the variables, indicating the need to reassess the variables or improve the model to produce more accurate and reliable results

Table 14.
ANOVA Analysis.

Source of Variation	Sum of Squares	df	Mean Square
Regression	12.130	12	1.011

Table 15.
Implementation Notes of ERM Practices in Saudi Insurance Companies Compared with Regulatory and International Standards.

Item	[1] COSO	[17] ISO 31000	Saudi Central Bank requirements	Implementation Notes in Saudi Insurance Companies
overall Risk Management Framework	Comprehensive framework integrating risk with strategy and performance	General guidelines for enterprise-wide risk management	Companies must implement an integrated framework covering all types of risks	Most companies implement the framework but need better integration with strategy
Risk Identification	Focus on strategic and operational risk identification	Focus on identifying risks at all organizational levels	Mandatory periodic identification of financial and non-financial risks	Companies often focus on financial risks; non-financial risks need better coverage
Risk Assessment	Analyzing risks to determine impact and likelihood	Quantitative and qualitative risk assessment	Companies must use formal assessment methods approved by	Some companies have not yet adopted standardized assessment methods, especially for emerging risks
Risk Treatment	Strategies to address risks (avoid, transfer, mitigate, accept)	Envelop integrated treatment plans with kpis	Mandatory documentation and periodic review of risk treatment strategies	Companies implement treatment partially; documentation and monitoring need improvement
Risk Governance	Involvement of board and executive management	Engagement of all organizational levels	Appoint a chief risk officer (cro) and a risk committee at board level	Most companies have risk committees, but executive involvement needs strengthening
Reporting & Monitoring	Performance monitoring and system improvement	Periodic evaluation of risks and processes	Mandatory submission of periodic reports to insurance authority	Reporting exists but varies in detail and accuracy

A Comparative Analysis of Enterprise Risk Management (ERM) Implementation in Saudi Insurance Companies Based on COSO and ISO 31000 Standards, in Alignment with the Requirements of the Saudi Central Bank and the Saudi Arabian Insurance Authority

17. Discussion

- The study results indicated that the implementation of Enterprise Risk Management (ERM) in Saudi insurance companies largely aligns with international standards (COSO and ISO 31000) and contributes to enhancing corporate sustainability by improving financial and operational performance and reducing operational risks. The results showed that companies with strong corporate governance achieve better integration between ERM and sustainability, as risk committees and boards of directors play an effective role in monitoring and guiding risk policies.
- The study also highlighted some challenges in integrating international standards with the Saudi Central Bank Insurance Authority regulatory requirements, particularly regarding emerging risks and standardized reporting, indicating the need to strengthen a comprehensive risk culture across all organizational levels.
- These findings are consistent with previous studies [4, 8, 11] which emphasized that ERM enhances financial solvency and operational stability, while governance acts as a mediating factor that increases the effectiveness of risk management implementation

18. Results

- There is a significant positive effect of Enterprise Risk Management on corporate sustainability in Saudi insurance companies.
- Corporate governance plays an important mediating role between ERM and sustainability; companies with effective governance structures achieve higher performance and better sustainability outcomes.
- Implementing ERM according to COSO and ISO 31000 standards contributes to improving financial solvency, increasing operational efficiency, and reducing operational and financial risks.
- Gaps exist in integrating international standards with insurance Authority local requirements, particularly regarding emerging risks and standardized reporting.

19. Recommendations

- Enhance ERM Implementation: Integrate enterprise risk management into the strategy of each insurance company to ensure financial and operational sustainability.
- Strengthen Corporate Governance: Enhance the role of boards of directors and risk committees in guiding and monitoring risk policies to increase ERM effectiveness.
- Develop Organizational Risk Culture: Provide training programs and workshops to improve risk awareness at all organizational levels.
- Standardize Reporting and KPIs: Establish unified standards for risk and sustainability reports in line with insurance Authority regulations and Vision 2030 objectives.
- Continuous Research and Development: Encourage future studies to assess the impact of ERM implementation on sustainability in other financial sectors within the Kingdom.

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