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Corporate governance, firm characteristics and risk management committee formation in Saudi Arabia

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Abstract

This study investigates the determinants influencing the establishment of Risk Management Committees (RMCs) and Separate Risk Management Committees (SRMCs) in Saudi firms on the period of 2017 to 2020. Drawing on agency theory and prior governance literature, logistic regression analysis was employed to examine the role of board characteristics, industry affiliation, and organizational complexity. The findings reveal that the presence of non-executive directors, an independent chairman, and larger board size significantly increase the likelihood of RMC and SRMC formation, underscoring the importance of board independence and diversity in strengthening risk oversight structures. In the context of Saudi Arabia's Vision 2030, these results highlight the critical role of governance structures in promoting proactive risk management. The study contributes to offer practical insights for policymakers, regulators, and corporate leaders.

Keywords: Agency theory, Independent chairman, Non-executive directors, Risk management committees, Risk management, Separate risk management committees.

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1. Introduction

In recent years, studies have increasingly focused on corporate governance as a mechanism to enhance corporate performance and manage various business risks. From both policy and practice perspectives, proponents of corporate governance argue that effective governance has a positive impact on firm performance. Corporate governance legislation and guidelines issued by government agencies and international bodies, when properly implemented, not only assist individual firms but also contribute to the broader economic environment by attracting foreign investment. These governance codes are designed to ensure investor protection and safeguard against corporate scandals [1].

For investors, one of the most critical considerations when making investment decisions is the extent to which a company implements corporate governance principles—such as public disclosure of information, protection of shareholder

rights, and equitable treatment of shareholders—alongside measures of profitability, which collectively ensure a return on investment [2].

In Saudi Arabia, the Kingdom of Saudi Arabia Code of Corporate Governance (KSACCG) was issued by the Board of the Capital Market Authority pursuant to Resolution Number 8-16-2017, dated 16/5/1438H (13/2/2017) [3] based on the Companies Law issued by Royal Decree No. M/3, dated 28/1/1437H [4]. The Code was later amended by Resolution Number 8-5-2023, dated 25/6/1444H (18/1/2023) [5] based on the Companies Law issued by Royal Decree No. M/132, dated 1/12/1443H [4]. Listed Saudi companies are required to report annually on their compliance with the principles and recommendations of Klein [6].

The motivation for examining corporate governance at the company level in developing countries, such as Saudi Arabia, stems from the recognized importance of good governance for national economic development. This research is further motivated by the economic reforms introduced under Saudi Arabia's Vision 2030, aimed at attracting foreign investment and mobilizing domestic savings. These reforms have directly or indirectly sought to enhance corporate governance practices, which in turn may positively influence firm performance. Moreover, empirical research on corporate governance practices in Saudi markets remains limited, highlighting the need for further study.

The paper is structured as follows: Section 2 reviews the literature on corporate governance. Section 3 presents the theoretical framework and research hypotheses. Section 4 describes the research sample and data sources. Section 5 defines the research variables. Section 6 discusses the results, and Section 7 concludes with a summary and directions for future research.

2. Literature Review

Corporate governance codes are designed to ensure investor protection and safeguard firms against corporate scandals. It is increasingly recognized that there is no one-size-fits-all approach to achieving effective governance [7, 8]. Evidence suggests that governance practices vary across countries [9-11] a difference often attributed to the institutional development and background of the country [12-14]. Regulatory bodies attempt to develop governance codes based on international best practices while adapting them to their domestic business environments.

The Risk Management Committee (RMC) has become a common supervisory instrument for overseeing risks, which is vital for business operations [15]. In Australian companies, more than 54% had an RMC, of which 70% consisted of members from the audit committee Dollery, et al. [16]. Subramaniam, et al. [15] state that the general duties and authority of RMCs cover the organization's risk management strategy, operational risk management, and financial reporting, all of which are essential to ensure compliance with applicable regulations and laws.

Halim, et al. [17] identified that the presence of an RMC affects company performance. Additionally, the RMC can act as an intervening variable between corporate governance mechanisms—such as auditor reputation, audit committee independence, board size, and board meeting frequency—and firm performance, including the mitigation of financial reporting risk.

Board committees, typically including audit, nomination, and remuneration committees, are sub-units of the board designed to improve efficiency and provide detailed oversight of key governance areas. These committees help reduce agency problems by enhancing transparency, strengthening management monitoring, and promoting independent decision-making [18].

Auditing is one of the most important elements of corporate governance, and all governance codes worldwide require listed companies to establish an audit committee. Audit committees assist the Board of Directors in implementing effective corporate governance practices. They help mitigate agency problems by reducing information asymmetry between managers and external stakeholders [6]. An effective audit committee is a key aspect of a strong corporate governance system [19]. The audit committee monitors accounting, reporting, and auditing processes, which helps resolve agency problems and assists shareholders in controlling firm resources [20].

Remuneration committees are responsible for setting executive compensation and ensuring pay aligns with performance. Independent remuneration committees are more likely to tie CEO compensation to firm performance [21]. These committees also help reduce agency costs, particularly in firms with weak ownership structures [22].

Nomination committees recommend candidates for board membership, promote transparency, and reduce CEO dominance. Independent nomination processes lead to more effective board composition [23]. The Cadbury [24] recommended independent nomination committees to strengthen corporate accountability.

The independence of board committees is key to effective governance. Independent monitoring committees improve overall board performance John and Senbet [25]. Leung, et al. [26] demonstrated that board and committee independence positively impacts firm performance in non-family firms. Hampel Committee on Corporate Governance [27] emphasized committee independence as a cornerstone of good governance.

Boards and their key committees—i.e., audit, remuneration, and nomination committees—enhance board effectiveness. Stock market reactions to the appointment of independent outside directors are more positive when the director selection process is perceived as independent of CEO influence [23]. According to Narasimhan and Jaiswall [22] the remuneration committee plays an important role in mitigating agency problems, which is particularly relevant when family ownership is low or non-family members hold key positions [28].

The main objective of this research is to study and analyze the impact of certain corporate governance and firm characteristics on the formation of Risk Management Committees (RMCs) in Saudi companies. From this main objective, the following sub-goals are derived:

1. To examine the formation of Risk Management Committees in joint-stock companies listed in Saudi Arabia, including whether a committee exists and, if so, whether it is separate from the audit committee or combined.
2. To measure corporate governance (board characteristics) and firm characteristics of companies listed on the Saudi Stock Exchange during the period 2017–2020.
3. To investigate the association between board and firm characteristics and the type of RMC, namely a separate and distinct RMC versus an RMC combined with the audit committee.

3. Theoretical Framework

Board committees are specialized sub-groups within the board of directors, established to enhance oversight, expertise, and efficiency in corporate governance. Several theoretical perspectives can be applied to understand the formation, structure, and impact of board committees:

3.1. Agency Theory

Agency theory Jensen and Meckling [29] posits that conflicts of interest exist between principals (shareholders) and agents (managers), as agents may not always act in the best interest of principals. Board committees, particularly audit, remuneration, and nomination committees, serve as mechanisms to mitigate agency problems by:

- Monitoring managerial actions (e.g., audit committee)
- Aligning executive compensation with firm performance (e.g., remuneration committee)
- Ensuring independent oversight in board appointments (e.g., nomination committee)

3.2. Resource Dependence Theory

Resource dependence theory [30] views the board as a provider of critical resources such as expertise, legitimacy, and access to external networks. Committees composed of members with specialized knowledge (e.g., finance, law, industry) can provide tailored strategic insights and external linkages, thereby enhancing the quality of decision-making.

3.3. Stewardship Theory

Contrary to agency theory, stewardship theory assumes that managers act as stewards of the organization, aligning their goals with those of shareholders [31]. Under this perspective, committees are not merely control mechanisms but collaborative governance tools, where directors support and advise management to achieve long-term value creation.

3.4. Signaling Theory

Signaling theory suggests that organizations benefit from disclosing improved governance initiatives and practices to build a favorable image in the market [32, 33]. The establishment of board committees can therefore serve as a signal of strong governance, transparency, and accountability to investors and stakeholders.

3.5. Institutional Theory

Institutional theory DiMaggio and Powell [34] emphasizes how organizational practices are shaped by norms, regulations, and societal expectations. The establishment and structure of board committees may be influenced by:

- Regulatory requirements (e.g., mandated audit committees)
- Adoption of best-practice governance codes
- Stakeholder pressure for transparency and accountability

3.6. Stakeholder Theory

Stakeholder theory Freeman [35] argues that corporations have responsibilities toward a broad group of stakeholders beyond shareholders. Board committees, particularly those focused on sustainability, corporate social responsibility (CSR), or ethics, serve as mechanisms to incorporate stakeholder interests into governance practices.

In sum, the existence and functioning of board committees can best be understood through a multi-theoretical lens. Agency theory highlights their monitoring role; resource dependence underscores the importance of expertise; stewardship emphasizes collaboration; signalling theory explains their reputational role; institutional theory highlights conformity to norms and regulations; and stakeholder theory emphasizes broader accountability. Together, these perspectives provide a comprehensive framework for analyzing the role of board committees in corporate governance.

4. Research Hypotheses

Based on the literature review and theoretical framework, the following research hypotheses are proposed:

H1(a). The existence of RMC is significantly and positively associated with the percentage of non-executive directors on the board.

H1(b). The existence of a separate RMC is significantly and positively associated with the percentage of non-executive directors on the board.

H2(a). The existence of RMC is significantly and positively associated with the use of an independent chairman on the board.

H2(b). The existence of a separate RMC is significantly and positively associated with the use of an independent chairman on the board.

H3(a). The existence of RMC is significantly and positively associated with board size.

H3(b). The existence of a separate RMC is significantly and positively associated with board size.

H4(a). The existence of RMC is significantly and positively associated with the use of a big four external auditors.

H4(b). The existence of a separate RMC is significantly and positively associated with the use of a big four external auditors.

H5(a). The existence of RMC is significantly and positively associated with the organization in the financial industry.

H5(b). The existence of a separate RMC is significantly and positively associated with organization in the financial industry.

H6(a). The existence of a RMC is significantly and positively associated with larger number of business segments.

H6(b). The existence of a separate RMC is significantly and positively associated with larger number of business segments.

H7(a). The existence of RMC is significantly and positively associated with the portion of accounts receivable and inventory.

H7(b). The existence of a separate RMC is significantly and positively associated with the portion of accounts receivable and inventory.

H8(a). The existence of a RMC is significantly and positively associated with the portion of long-term debts.

H8(b). The existence of a separate RMC is significantly and positively associated with the portion of long-term debts.

5. Population and Research Sample

This study employs panel data covering the period from 2017 to 2020. The dataset is quantitative in nature and derived from secondary sources, specifically annual reports and financial statements obtained from the Saudi Arabian Stock Exchange (Tadawul).

The study population comprises Saudi Arabian companies classified as emerging market firms and listed on the Saudi Arabian Stock Exchange during the study period. The research sample was drawn from firms operating in selected economic and industrial sectors, namely energy, materials, capital goods, banking, and insurance.

To be included in the sample, firms were required to satisfy the following criteria:

- The company's shares must have been listed on the Saudi Arabian Stock Exchange and actively traded throughout the study period.
- The company must have been listed for at least three years, must not have incurred accumulated losses equivalent to 20% or more of its capital during the study period, and must not have been subject to delisting, merger, or suspension.
- The company's financial reports must have been consistently available and disclosed in Saudi Arabian currency through the company's official website, with sufficient data accessible to measure the study variables.

Table 1 presents the study population and the procedures employed in selecting the final sample.

Table 1.
Study sample and Total Observation.

Information	Total
Companies listed on the Saudi Arabian Stock Exchange (Energy,Materials, Capital Goods, Banks and Insurance sectors)	100
Excluded company	(49)
Companies used as sample	52
Research Period (2017-2020)	4
Total observations (52 companies x 4 years)	208

The application of the above criteria resulted in the selection of 51 companies, whose data were analyzed over a four-year period, yielding a total of 208 observations. Figure 1 illustrates the composition of the study sample.

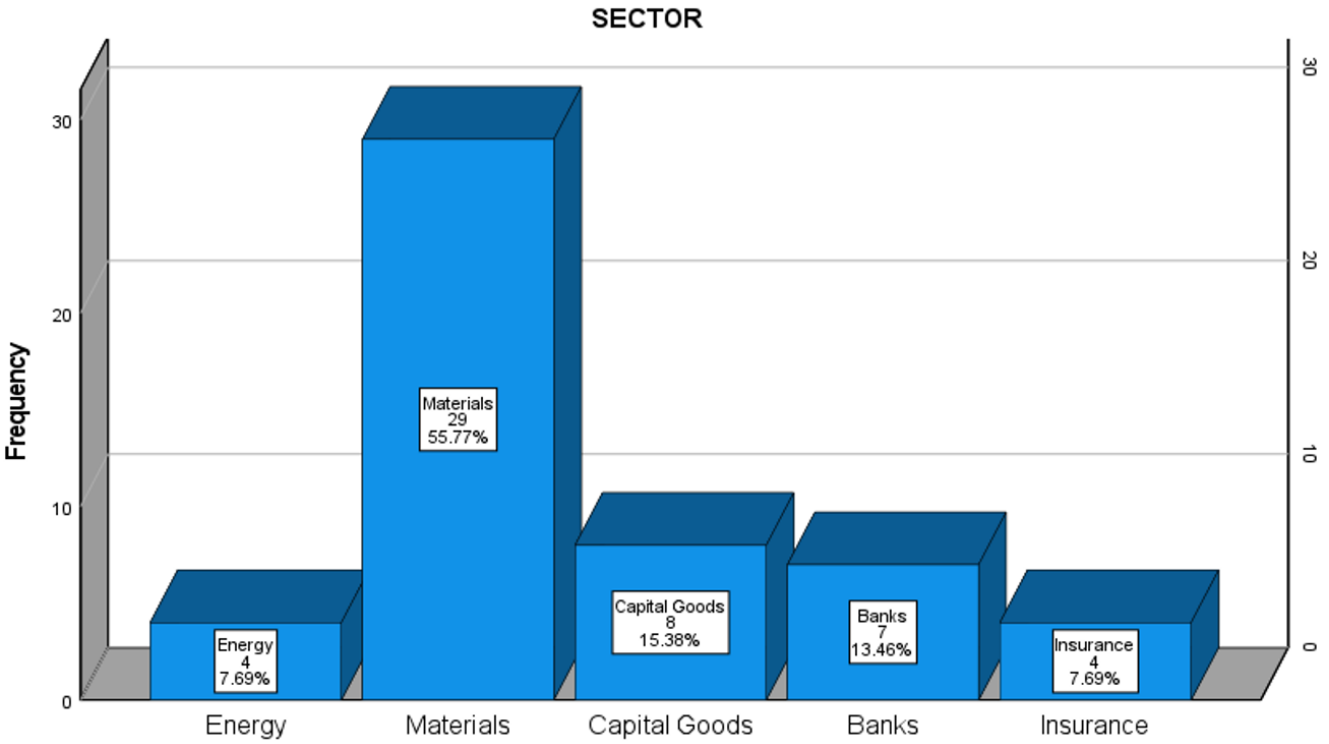

Figure 1.
Study sample.

6. Data Source

Information was collected from the Saudi Arabian Stock Exchange website as well as other reliable statistical and financial analysis platforms. Data related to the empirical study variables were obtained from the following sources:

- Official websites of the sampled firms.
- Saudi Arabian Stock Exchange (Tadawul): https://www.saudiexchange.sa
- Mubasher Saudi: https://www.mubasher.info/markets/sa
- Investing.com: https://sa.investing.com
- Reuters: http://www.reuters.com/finance

7. Research Model

Logistic regression analysis was employed, as this method is appropriate when the dependent variable is dichotomous. In the present study, the dependent variables—existence of a Risk Management Committee (RMC) and existence of a Separate Risk Management Committee (SRMC)—are both dichotomous.

Two models were developed, each regressing nine independent variables against one of the dependent variables.

The following logistic regression equation that tested:

$$logit\ (p1) = a + B1(INDEPCHAIR) + B2(NONEXECDIR) + B3(BOARDSIZE) + B4(BIGFOUR) + B5(TYPE) + B6(BUSSEGMENT) + B7(REC\&INV/ASSET) + B8(DEBT/ASSET) + B9(SIZE)$$

The conceptualization of RMC existence in this study is categorized into three groups:

Nil or non-existent: the company has not established or disclosed an RMC.

Combined committee: the company discloses a board committee under the combined heading of Audit and RMC.

Separate RMC: the company discloses a distinct board committee specifically tasked with overseeing risk management.

The dependent variables were defined as follows:

RMC existence: coded 1 if an RMC exists (either separate or combined with the audit committee), and 0 if no RMC exists.

SRMC existence: coded 1 if a separate RMC exists, and 0 otherwise (i.e., no RMC or an RMC combined with the audit committee).

The independent variables were defined as follows:

Independent Chairman (INDEPCHAIR): coded 1 if the chairman is independent, 0 otherwise.

Proportion of Non-Executive Directors (NONEXECDIR): the ratio of non-executive directors to the total number of board members.

Board Size (BOARDSIZE): the total number of directors on board.

Auditor Reputation (BIG4): coded 1 if the auditor is one of the Big Four firms (Deloitte, PwC, EY, or KPMG), 0 otherwise.

Industry Type (TYPE): coded 1 for financial firms (banks and insurance companies) and 0 for non-financial firms.

Organizational Complexity (BUSSEGMENT): coded 1 if the company operates multiple business segments and 0 otherwise.

Financial Reporting Risk (REC&INV/ASSET): calculated as receivables plus inventories divided by total assets.

Leverage (DEBT/ASSET): calculated as total long-term liabilities divided by total assets.

Firm Size (SIZE): measured by the natural logarithm of total assets (control variable).

8. Empirical Result

Testing the validity of data is performed through a series of tests as follows:

8.1. Normal Distribution Test

To assess the distributional properties of the study's continuous variables, both the Kolmogorov–Smirnov and Shapiro–Wilk tests were conducted. These tests are commonly applied to examine whether the data deviate significantly from a normal distribution, which in turn determines the appropriateness of using parametric or non-parametric statistical methods in the subsequent analysis.

Table 2.
Normal Distribution for the Study Continuous Variables.

Continuous Variables		**Kolmogorov-Smirnov Statistic**		**Shapiro-Wilk Statistic**	
		Value	**Sig.**	**Value**	**Sig.**
Proportion of Non-Executive Directors	NONEXECDIR	0.264	<0.001	0.762	<0.001
Bord Size	BOARDSIZE	0.209	<0.001	0.921	0.002
Financial Reporting Risk	REC&INV/ASSET	0.172	<0.001	0.886	<0.001
Leverage	Lev	0.106	0. 002	0.937	0.010
Firm SIZE	SIZE	0.181	<0.001	0.916	0.002

Note: *. This is a lower bound of the true significance.

The results presented in Table 2 reveal that the significance levels (Sig.) for both the Kolmogorov–Smirnov and Shapiro–Wilk tests are less than 0.05 for all variables while the Leverage variable recorded significance values greater than 0.05. This indicates that these variables that are less than 0.05 significantly deviate from the assumption of normality. In contrast, confirming that it does not significantly depart from a normal distribution.

Accordingly, it can be concluded that the all variables are not normally distributed, whereas the Leverage variable is approximately normally distributed. Based on these findings, non-parametric statistical tests were employed in the analysis of variables that violated the normality assumption, while parametric tests were considered suitable for variables that met the normality requirement.

Table 3 presents the multicollinearity test results, which report on the Variance Inflation Factor (VIF) for each independent variable. All values fall below the accepted threshold, confirming the absence of multicollinearity. Furthermore, diagnostic tests indicate that the model variables are free from autocorrelation, ensuring the robustness of the regression analysis. The low and statistically insignificant correlations between variables further confirm the robustness of the model and its suitability for assessing the impact of independent variables on the dependent variables.

Table 3.
Multicollinearity Test, Durbin Watson Test results.

Independent Variables	**Multicollinearity Test**		**Durbin Watson Test**
	VIF	**Tolerance**	
NONEXECDIR	1.636	0.611	**2.363**
INDEPCHAIR	1.151	0.869	
BOARDSIZE	2.329	0.429	
BIG4	2.129	0.470	
TYPE	1.883	0.531	
BUSSEGMENT	1.887	0.530	
REC&INV/ASSET	1.460	0.685	
LEV	2.048	0.488	
SIZE	2.691	0.372	

Additionally, the Durbin–Watson (DW) statistic was 2.363, which falls within the recommended range of 1.5–2.5, suggesting no autocorrelation among the independent variables. These diagnostics collectively confirm that the model is free from multicollinearity and autocorrelation issues, thereby supporting the validity of the statistical analysis and the reliability of the results.

8.2. Descriptive Statistics

Tables 4 and 5 reveal that among the sampled firms, 78.8% (n = 41) have an independent chairman, while 21.2% (n = 11) exhibit CEO duality. Regarding auditor reputation, 51.9% (n = 27) of the sample firms were audited by a Big Four audit firm or an affiliated firm during the study period, reflecting both the size and quality of the audit function. In terms of industry classification, 21.2% (n = 11) of the sample firms are financial companies, whereas 78.8% (n = 41) belong to other industries.

Regarding organizational complexity, 51.9% (n = 27) of firms operate multiple business segments, while 48.1% (n = 25) operate fewer segments. The average proportion of non-executive directors on board is 90%, with a minimum of 50% and a maximum of 100%. Board sizes among the 52 companies sampled, range from 4 to 10 directors, with an average of 7.19 directors.

Financial reporting risk, measured as the proportion of accounts receivable and inventories to total assets (REC&INV/ASSET), exhibits a maximum value of 0.73, confirming variability in financial reporting risk among the firms over the study period. The annual averages were 0.2828 (2017), 0.2804 (2018), 0.2775 (2019), and 0.2781 (2020).

Financial leverage, calculated as the ratio of total long-term debt to total assets, averaged 0.51, with a maximum of 0.91 over the study period. Firm size, measured by the natural logarithm of total assets, increased consistently from 2017 to 2020, with annual averages of 8.4386 (2017), 8.4657 (2018), 8.5211 (2019), and 8.5307 (2020), indicating growth in the sample firms' size over the period.

Table 4.
Descriptive Statistics of the Dichotomous Study Variables.

(Variable Dummy)	Views	Value	No.	%
RMC existence	NO RMC	Value (0)	16	30.8%
	RMC	Value (1)	36	69.2%
SRMC existence	Combined RMC	Value (0)	11	21.2%
	Separate RMC	Value (1)	25	48.1%
Independent Chairman (INDEPCHAIR):	CEO duality	Value (0)	11	21.2%
	Independent Chairman	Value (1)	41	78.8%
Auditor Reputation	Not from BIG4	Value (0)	25	48.1%
	BIG4	Value (1)	27	51.9%
Industry Type	Non-Financial Industry	Value (0)	41	78.8%
	Financial Industry	Value (1)	11	21.2%
Organizational Complexity	Small number of business segments	Value (0)	25	48.1%
	Larger number of business segments	Value (1)	27	51.9%

Table 5.
Descriptive Statistics of the Continuous Study Variables.

Continuous Variables	Year	Mean	Std. Dev.	Max.	Min.	Skew
NONEXECDIR	Current situation	0.9057	0.11713	1.00	0.50	-1.670
BOARDSIZE	Current situation	7.1923	1.49559	10.00	4.00	-0.416
REC&INV/ASSET	RECINV2017	0.2828	0.23159	0.69	0.00	0.564
	RECINV2018	0.2804	0.23017	0.69	0.00	0.570
	RECINV2019	0.2775	0.23145	0.73	0.00	0.583
	RECINV2020	0.2781	0.23457	0.73	0.00	0.564
The Average	RECINV	0.2816	0.23095	0.71	0.00	0.536
Leverage (Over the study period)	LEV2017	0.5010	0.26637	0.91	0.02	-0.192
	LEV2018	0.5164	0.26992	0.90	0.02	-0.334
	LEV2019	0.5126	0.26858	0.89	0.01	-0.338
	LEV2020	0.5102	0.27206	0.91	0.01	-0.330
The Average	LEV	0.5100	0.26630	0.89	0.01	-0.298
SIZE (Over the study period)	SIZE2017	8.4386	2.13490	13.01	4.89	0.614
	SIZE2018	8.4657	2.12844	13.02	4.99	0.633
	SIZE2019	8.5211	2.16022	13.14	5.05	0.627
	SIZE2020	8.5307	2.18123	13.30	5.24	0.664
The Average	SIZE	8.4890	2.14880	13.12	5.04	0.637

The charter of a separate RMC generally reflects a comprehensive, organization-wide approach to risk management. Examples of RMC charters reported in the annual reports include the following:

- The Risk Committee is responsible for ensuring that risks and opportunities are identified in a timely manner, and that the group's objectives and activities align with the risks and opportunities identified by the board. Areas of risk considered by the RMC include:
- Safety
- Environmental impact
- The community in which the company operates
- Minimization of business risk
- The responsibilities of the Risk Committee include:
- Reviewing the group's risk profile in the context of the risk–return profile determined by the board
- Implementing and monitoring risk management, internal compliance, and control systems throughout the group
- Reviewing the adequacy and effectiveness of the group's compliance management framework
- Evaluating the balance sheet risk management framework and strategies
- Overseeing the group's credit policies
- Assessing operational risks
- Reviewing business risk management practices
- Monitoring country-specific lines of credit
- Reviewing the group's liquidity policies

The RMC is responsible for reviewing risks across all aspects of the business. It oversees, monitors, and evaluates the group's risk management principles, policies, strategies, processes, and controls, including credit, market, balance sheet, operational, and compliance risks. The committee may also approve credit transactions and other matters exceeding the approval authority of executive management. Figure 2 illustrates the distribution of RMC and SRMC among the sampled firms.

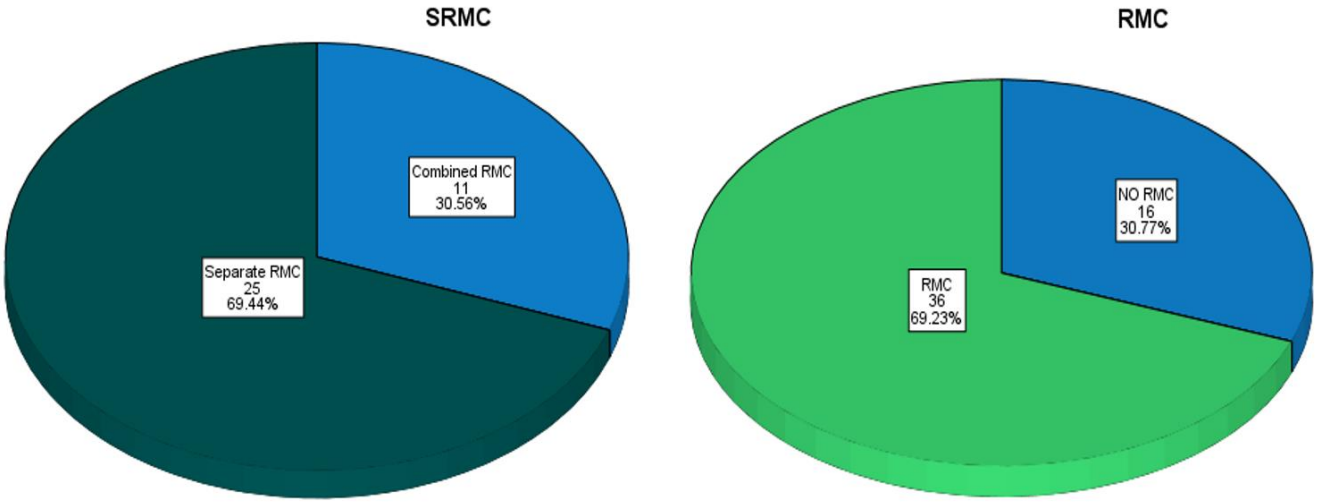

Figure 2.
The distribution of RMC and SRMC.

8.3. Correlation Matrix Analysis

Tables 6, 7 present Pearson correlation coefficients between board structure variables (e.g., non-executive directors, independent chair, board size), audit-related attributes (BIG4), firm characteristics (type, business segments, leverage, size), and proxies for risk management committee (RMC / SRMC). The significance values (Sig.) indicate whether the correlations are statistically significant.

Non-Executive Directors (NONEXEC DIR) show a strong positive correlation with RMC ($r = .615$, $p < .001$), suggesting that firms with a higher proportion of non-executive directors are more likely to establish or strengthen their risk management committee.

Board Size is also strongly correlated with RMC ($r = .673$, $p < .001$), meaning larger boards are associated with more developed RMC structures.

Big Four Auditors (BIG4) exhibit a significant positive correlation with RMC ($r = .693$, $p < .001$). This implies that firms audited by Big 4 auditors tend to adopt stronger RMC practices.

Firm Size (SIZE) is positively correlated with RMC ($r = .441$, $p < .001$), indicating that larger firms are more likely to have a dedicated RMC.

Leverage (LEV) shows a negative significant correlation with RMC ($r = –.519$, $p < .001$). Highly leveraged firms appear less likely to strengthen RMC practices, possibly due to financial constraints or governance inefficiencies.

Other variables (e.g., TYPE, business segment, receivables/investments) have weaker or nonsignificant relationships.

Board Size again shows a significant positive relationship with SRMC ($r = .517$, $p < .001$), reinforcing that larger boards enhance risk oversight.

BIG4 is strongly correlated with SRMC ($r = .724$, $p < .001$), suggesting that external auditor quality plays a crucial role in encouraging structured risk management committees. Firm Size shows the strongest correlation with SRMC ($r = .762$, $p < .001$), confirming that larger organizations institutionalize risk governance more systematically.

Independent Chair (INDEP CHAIR) ($r = .339$, $p = .022$) and Non-Executive Directors ($r = .280$, $p = .049$) are positively associated with SRMC, although weaker than BIG4 and SIZE. Leverage (LEV) again shows a negative but weaker significant correlation ($r = –.373$, $p = .013$). Business Segment and Receivables/Assets are not significantly associated with SRMC.

These findings can be interpreted within corporate governance and agency theory:

A higher presence of independent governance mechanisms (non-executives, independent chair, larger boards) is positively associated with the establishment of risk management committees. This supports the argument that independent oversight reduces agency conflicts and strengthens risk monitoring. Auditor quality (BIG4) is consistently a strong determinant of risk governance, reflecting external pressure for compliance and accountability. Firm size plays a critical role: larger firms face more complex risks and thus adopt more formalized risk management structures. The negative relationship with leverage suggests that highly indebted firms may prioritize short-term financial concerns over long-term governance improvements.

The correlation analysis demonstrates that board independence, board size, auditor quality, and firm size are positively and significantly associated with the presence of risk management committees, thereby supporting the agency theory perspective that stronger governance mechanisms enhance risk oversight. Conversely, financial leverage shows a negative association, indicating that firms with higher debt levels may deprioritize formal risk governance structures.

Table 6.
Correlation matrices :Model one (RMC.)

Model one	Variable	NON EXECDIR	INDEP CHAIR	BOARD SIZE	BIG4	TYPE	BUSSEGMENT	Rec & inv/assets	LEV	SIZE	RMC
NONEXECDIR	Correlation	1.000									
	.Sig	.									
INDEPCHAIR	Correlation	0.397**	1.000								
	.Sig	0.002	.								
BOARDSIZE	Correlation	0.411**	0.220	1.000							
	.Sig	0.001	0.058	.							
BIG4	Correlation	0.396**	0.256*	0.599**	1.000						
	.Sig	0.002	0.034	<0.001	.						
TYPE	Correlation	0.160	0.153	0.402**	0.404**	1.000					
	.Sig	0.128	0.139	0.002	0.001	.					
Business SEGMENT	Correlation	0.464**	0.256*	0.380**	0.384**	-0.067	1.000				
	.Sig	<0.001	0.034	0.003	0.002	0.318	.				
Rec & inv/assets	Correlation	-0.118-	0.019	0.030	0.005	0.159	0.304*	1.000			
	.Sig	0.205	0.446	0.416	0.485	0.133	0.015	.			
LEV	Correlation	0.323**	0.174	0.469**	0.422**	0.604**	0.058	0.215	1.00		
	.Sig	0.010	0.108	<0.001	<0.001	<0.001	0.342	0.065	.		
SIZE	Correlation	0.462**	0.265*	0.614**	0.637**	0.397**	0.314*	0.046	0.594**	1.00	
	.Sig	<0.001	0.029	<0.001	<0.001	0.002	0.012	0.374	<0.001	.	
RMC	Correlation	0.615**	0.267*	0.673**	0.693**	0.345**	0.609**	0.100	0.441**	0.519**	1.00
	.Sig	<0.001	0.028	<0.001	<0.001	0.006	<0.001	0.241	<0.001	<0.001	.

Note: * Indicates the significance of the correlation coefficient at the level of 0.05 significance
** Indicates the significance of the correlation coefficient at the level of 0.01 significance

Table 7.
Correlation matrices :Model two (SRMC)

Model one	Variable	NON EXECDIR	INDEP CHAIR	BOARD SIZE	BIG4	TYPE	BUSSEGMENT	Rec & inv/assets	LEV	SIZE	SRMC
NONEXECDIR	Correlation	1.000									
	Sig.	.									
INDEPCHAIR	Correlation	0.257	1.000								
	Sig.	0.065	.								
BOARDSIZE	Correlation	0.026	0.204	1.000							
	Sig.	0.440	0.116	.							
BIG4	Correlation	-0.064-	0.139	0.269	1.000						

	Sig.	0.356	0.209	0.056	.						
TYPE	Correlation	-0.096-	0.092	0.334*	0.244	1.000					
	Sig.	0.288	0.297	0.023	0.076	.					
Business SEGMENT	Correlation	0.260	0.110	-0.061-	-0.072-	-0.39**	1.000				
	Sig.	0.063	0.262	0.362	0.339	0.008	.				
Rec & inv/assets	Correlation	-0.305-*	-0.024-	0.041	-0.078-	0.158	0.332*	1.000			
	Sig.	0.037	0.445	0.408	0.329	0.182	0.026	.			
LEV	Correlation	-0.038-	-0.050-	0.487**	0.232	0.665**	-0.37*	0.169	1.000		
	Sig.	0.412	0.385	0.001	0.087	<0.001	0.013	0.166	.	<0.001	
SIZE	Correlation	0.012	0.143	0.589**	0.522**	0.345*	0.042	0.167	0.549**	1.000	
	Sig.	0.473	0.203	<0.001	<0.001	0.020	0.404	0.168	<0.001	.	
SRMC	Correlation	0.280*	0.339*	0.517**	0.724**	0.282*	0.014	-0.139-	0.373*	0.762**	1.000
	Sig.	0.049	0.022	<0.001	<0.001	0.048	0.467	0.214	0.013	<0.001	.

Note: * Indicates the significance of the correlation coefficient at the level of 0.05 significance
** Indicates the significance of the correlation coefficient at the level of 0.01 significance

8.4. Logistic Regression

The Hosmer–Lemeshow goodness-of-fit statistic was used to assess whether the logistic regression models adequately approximate the observed data [36-38]. A significance level greater than 0.05 indicates that the null hypothesis—stating no difference between the observed and predicted values—cannot be rejected, suggesting that the model provides an acceptable fit to the data.

To evaluate the combined effects of corporate governance factors (board characteristics, including proportion of non-executive directors, independent chairman, and board size) and firm characteristics (auditor reputation, industry type, organizational complexity, financial reporting risk, and leverage) on the formation and nature of risk management committees (RMC and SRMC), logistic regression analysis was conducted.

Table 8 presents the results of logistic regression analyses for RMC and SRMC. In Model 1, the Cox & Snell R^2 values are 0.537 for board characteristics and 0.634 for firm characteristics, indicating that the independent variables explain 53.7% and 63.4% of the variance in RMC existence, respectively. In Model 2, the Cox & Snell R^2 values are 0.685 for board characteristics and 0.740 for firm characteristics, suggesting that these variables account for 68.5% and 74% of the variance in SRMC existence, respectively.

According to the Wald statistics, proportion of non-executive directors, independent chairman, and board size positively and significantly predict RMC existence ($p = 0.027$, 0.005, and 0.027, respectively; $\alpha = 0.05$). For SRMC existence, these board characteristics also show positive associations ($p = 0.067$, 0.096, and 0.013, respectively; $\alpha = 0.10$ for the first two, $\alpha = 0.05$ for board size). Therefore, hypotheses H1(a,b), H2(a,b), and H3(a,b) are supported.

Regarding firm characteristics, external auditor type (BIG4), industry type (financial industry), organizational complexity (number of business segments), and leverage significantly predict RMC existence ($p = 0.096$, 0.097, 0.010, and 0.043, respectively). Consequently, hypotheses H4(a), H5(a), H6(a), and H8(a) are supported.

Table 8.
Logistic regression analysis.

The Dependent Variable		**Logistic regression analysis**					
		(model One =RMC)			**(model Two =SRMC)**		
		coefficient (B)	**S.E.**	**Wald statistic (z-ratio)**	**coefficient (B)**	**S.E.**	**Wald statistic (z-ratio)**
Board characteristics	(Constant) (B0)	11.489	-33.62	0.018	-153.353-	1644.978	0.926
	NONEXECDIR	10.217	24.238	0.027**	77.308	182.632	0.067*
	INDEPCHAIR	1.520	1.649	0.005**	7.662	1634.186	0.096*
	BOARDSIZE	0.661	1.853	0.027**	4.616	3.089	0.013**
	SIZE	0.349	0.133	0.003	4.354	2.481	0.079
-2 Log likelihood		24.177			6.560		
Cox & Snell R Square		0.537			0.685		
Nagelkerke R Square		0.757			0.929		
firm characteristics	(Constant) (B0)	-6.228-	6.754	0.356	-1036.297-	61761.225	0.987
	BIG4	19.802	6240.614	0.096*	51.022	14005.308	0.097*
	TYPE	19.822	8467.416	0.097*	90.578	40418.269	0.098*
	Business SEGMENT	4.789	1.867	0.010**	116.864	21817.679	0.996
	RECINV/ASSETS	-0.196-	6.135	0.975	-190.575-	13087.387	0.988
	LEV	3.222	4.132	0.043**	161.273	55485.276	0.098*
	SIZE	0.289	0.812	0.722	111.011	5592.319	0.984
-2 Log likelihood		12.247			0.000		
Cox & Snell R Square		0.634			0.740		
Nagelkerke R Square		0.890			1.000		

**Note: ***p , 0.10; * *p , 0.05 (one-tailed test of significance).

8.5. Hypotheses Testing

Regarding board characteristics, the first three sets of hypotheses (H1a, H2a, H3a) were supported. Specifically, the results show a significant and positive association between board attributes—independent chairman, proportion of non-executive directors, and board size—and the existence of RMCs. Similarly, board characteristics were positively associated with the establishment of a SRMC, supporting hypotheses H1b, H2b, and H3b.

The support for H2a and H2b suggests that an independent chairman may reduce agency costs by implementing control mechanisms such as RMCs. Additionally, the presence of an independent chairman appears to promote not only the establishment of RMCs but also the formation of separate and distinct RMCs.

Support for H3a and H3b indicates that larger boards provide sufficient resources to maintain and operate board committees. This finding aligns with the ASX [39]. Principles of Good Corporate Governance, which recommend that larger boards establish support mechanisms such as RMCs. The results are also consistent with Piot [40] who found a positive correlation between board size and the presence of audit committees in French listed companies. Larger boards are likely to increase the probability of members with the requisite risk expertise being available to form sub-committees. This

finding also supports signaling theory, whereby organizations establish separate RMCs to signal the adoption of robust monitoring mechanisms when agency costs are high.

Despite support for H1b, the results indicate a weak association between the proportion of non-executive directors and the existence of a SRMC. This finding is consistent with Piot [40] who found no significant relationship between non-executive directors and audit committee existence. One possible explanation is that non-executive directors may not always be financially independent, even if they are not involved in daily operations. For example, a non-executive director may hold a significant shareholding (>5%) in the company, reducing true independence.

Regarding firm characteristics, hypotheses H4a and H4b—proposing an association between external auditor type and RMC establishment—were not supported. The results indicate no significant correlation between the presence of RMCs and whether the firm is audited by a Big Four or non-Big Four auditor.

For the remaining firm characteristics (industry type, organizational complexity, financial reporting risk, and leverage), the results were mixed. Three of the four characteristics—industry type, organizational complexity, and leverage—were significantly associated with RMC existence, supporting H5a, H6a, and H8a. Financial reporting risk, however, was not significantly correlated with RMC existence (H7a not supported).

Regarding SRMC type, only two of the four hypotheses supported H5b, H8b, indicating significant associations between separate RMCs and both industry type and leverage. H6b and H7b were not supported; financial reporting risk exhibited a negative, non-significant association with separate RMCs, and organizational complexity showed a very weak non-significant correlation. This suggests that as complexity increases (based on the number of business segments), firms are more likely to establish combined committees rather than separate RMCs. A possible explanation is that combined committees may provide practical advantages when coordinating across multiple segments, allowing audit committees to jointly oversee risk management.

Finally, firm size was positively associated with both the existence and type of RMCs, indicating that larger organizations are more likely to establish RMCs, including separate RMCs.

For SRMC existence, external auditor type, industry type, and leverage remain significant predictors ($p = 0.097$, 0.098, and 0.098, respectively), supporting hypotheses H4b, H5b, and H8b. However, organizational complexity (number of business segments) is not significantly associated with SRMC, so H6b is not supported.

Finally, financial reporting risk (REC&INV/ASSET) does not significantly predict either RMC or SRMC existence, and therefore H7a,b is not supported.

The summary of research hypothesis testing is presented in Table 9.

Table 9.
The results of the research hypotheses.

NO	Hypotheses	Expected	Result
H1(a).	• The existence of RMC is significantly and positively associated with the percentage of non-executive directors on the board.	+	Accepted
H1(b).	• The existence of a separate RMC is significantly and positively associated with the percentage of non-executive directors on the board.	+	Accepted
H2(a).	• The existence of RMC is significantly and positively associated with the use of an independent chairman on the board.	+	Accepted
H2(b).	• The existence of a separate RMC is significantly and positively associated with the use of an independent chairman on the board.	+	Accepted
H3(a).	• The existence of RMC is significantly and positively associated with board size.	+	Accepted
H3(b).	• The existence of a separate RMC is significantly and positively associated with board size.	+	Accepted
H4(a).	• The existence of RMC is significantly and positively associated with the use of a big four external auditor.	+	Accepted
H4(b).	• The existence of a separate RMC is significantly and positively associated with the use of a big four external auditor.	+	Accepted
H5(a).	• The existence of RMC is significantly and positively associated with the organization in the financial industry.	+	Accepted
H5(b).	• The existence of a separate RMC is significantly and positively associated with the organization in the financial industry.	+	Accepted
H6(a).	• The existence of RMC is significantly and positively associated with a larger number of business segments.	+	Accepted
H6(b).	• The existence of a separate RMC is significantly and positively associated with a larger number of business segments.	-	Reject
H7(a).	• The existence of RMC is significantly and positively associated with the portion of accounts receivable and inventory.	-	Reject
H7(b).	• The existence of a separate RMC is significantly and positively associated with the portion of accounts receivable and inventory.	-	Reject

H8(a).	• The existence of RMC is significantly and positively associated with the portion of long-term debts.	+	Accepted
H8(b).	• The existence of a separate RMC is significantly and positively associated with the portion of long-term debts.	+	Accepted

9. Results and Discussion

The primary objective of this study was to examine the determinants associated with board and firm characteristics and their influence on the establishment of Risk Management Committees (RMCs) and Separate Risk Management Committees (SRMCs). Logistic regression analysis yielded several significant findings supporting the majority of the proposed hypotheses.

9.1. Characteristics Board

Non-executive directors were found to have a statistically significant positive association with the existence of both RMCs and SRMCs. This finding aligns with agency theory, which posits that independent directors play a critical monitoring role and are more likely to support formal risk oversight structures. Similarly, the presence of an independent chairman positively influenced the likelihood of establishing RMCs and SRMCs, indicating that leadership separation between the board and executive management promotes stronger governance practices.

Board size was also positively and significantly associated with both RMC and SRMC formation. Larger boards tend to possess diverse expertise and resources, enabling the creation of specialized committees, including those focused on risk management. These results are consistent with prior research [41, 42] which highlights that organizational capacity facilitates granular governance structures.

9.2. Firm Characteristics

Firms operating in the financial sector were more likely to establish RMCs and SRMCs, reflecting regulatory expectations and higher risk sensitivity in financial institutions [43, 44]. Firms with multiple business segments were also more likely to implement RMCs and SRMCs, suggesting that operational complexity necessitates more structured risk oversight mechanisms [45, 46].

A positive association was observed between leverage and RMC/SRMC formation, indicating that highly leveraged firms establish dedicated risk governance structures to manage financial risks [47]. Conversely, the use of Big Four auditors and the proportion of accounts receivable and inventory did not significantly influence the formation of risk committees. This implies that while external audit quality and working capital structure are important for financial reporting, they may not directly drive the formalization of internal risk oversight mechanisms.

Overall, 12 out of 16 hypotheses were supported, underscoring the critical role of board composition, governance practices, industry affiliation, and organizational complexity in shaping risk oversight structures.

10. Comparison with Previous Studies

The findings are largely consistent with prior research:

Non-Executive Directors & Board Independence: Positive relationships between board independence and RMC/SRMC formation support the conclusions of Subramaniam, et al. [15] and Malik, et al. [48].

Independent Chairman: The significance of an independent chairman mirrors Hoitash, et al. [49] who highlight leadership separation as enhancing internal controls, including risk management.

Board Size: Larger boards are linked to subcommittee formation, consistent with Khan and Ali [41] and Mashayekhi and Bazaz [42].

Financial Industry: Alignment with Christopher, et al. [43] and Spira and Page [44] confirms that regulatory pressures incentivize formal risk oversight in financial institutions.

Organizational Complexity: Results corroborate Yatim [45] and Beasley, et al. [46] who find that diverse operational environments increase the likelihood of formal risk governance adoption.

Leverage: Harford, et al. [47] emphasizing that financial risk exposure motivates dedicated oversight mechanisms.

However, the lack of significant influence of Big Four auditors and working capital measures contrasts with expectations from studies such as Carcello, et al. [50] and Pagach and Warr [51] indicating that traditional indicators of governance quality and operational risk may not uniformly drive RMC formation across contexts.

11. Conclusion, Contribution and Future Research

This study investigated the key determinants influencing the establishment of RMCs and SRMCs in Saudi firms, drawing on agency theory and corporate governance literature. Logistic regression analysis demonstrated that:

Board characteristics—non-executive directors, independent chairman, and larger board size—significantly and positively influence RMC and SRMC formation. Firm characteristics—financial sector affiliation, multiple business segments, and higher leverage—also increase the likelihood of establishing risk committees. External auditor type (Big Four) and operational risk (REC&INV/ASSET) were not significant predictors, suggesting that internal governance structures respond more to organizational and board-level factors than to auditor quality or working capital considerations.

These findings highlight the importance of aligning internal governance structures with firm-specific risk profiles and regulatory expectations. In the context of Saudi Arabia's evolving regulatory landscape and Vision 2030, the presence of RMCs reflects organizational commitment to proactive risk oversight.

This study contributes to the literature on corporate governance by identifying conditions under which firms formalize risk oversight structures. Practical implications include:

- Guiding policymakers and regulators on factors that enhance internal risk management.
- Informing corporate leaders on board composition and firm characteristics conducive to effective risk governance.

The study suggests several avenues remain open for further investigation:

1. Longitudinal Analysis: Assessing how changes in corporate governance structures over time affect RMC formation and effectiveness.
2. Effectiveness of RMCs: Examining the actual performance of RMCs in mitigating financial, operational, and compliance risks.
3. Sectoral Comparisons: Comparing RMC adoption across industries or between listed and unlisted firms.
4. Cross-Country Analysis: Evaluating cultural, legal, and economic influences on governance structures within the GCC region.
5. Qualitative Insights: Using interviews with board members, risk officers, and regulators to understand motivations and challenges behind RMC implementation.
6. ESG and Sustainability Influence: Investigating how ESG initiatives affect the formation and role of RMCs.
7. Regulatory Changes: Analyzing the impact of recent or upcoming CMA regulations on risk governance structures.

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