The Influence of Corporate Governance on Risk Management: Assessing the Impact of Board Composition and Shareholding in Saudi Arabia's Insurance Industry

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Abstract

Effective corporate governance plays a critical role in managing risks and aligning stakeholder interests within the Saudi Arabian insurance sector. Despite significant progress since the 2006 financial crisis, challenges remain in aligning practices with international standards, particularly in board composition and shareholding. This study evaluates the relationship between corporate governance elements such as board composition and board shareholding and their impact on risk management in Saudi insurance companies. Using correlation and regression analyses, the study finds no significant relationship between board composition and risk management. Similarly, board shareholding showed no significant impact on risk outcomes. The study recommends enhancing regulatory standards to increase board diversity and independence, along with specialized training for risk management committees to effectively mitigate risks.

Keywords: *Board Governance, Risk Management, Insurance, Training, Saudi Arabian.*

Introduction

The evolution of corporate governance has been shaped by significant financial crises and corporate scandals worldwide. For instance, the 1987 market crash and subsequent collapses prompted a comprehensive reform of corporate governance practices globally (Mahdy, 2019). The East Asian financial crisis of 1997-1998 further highlighted the critical role of corporate governance, especially in protecting minority shareholders and maintaining market stability (Johnson et al., 2000). The crisis underscored the importance of robust governance mechanisms to prevent managerial expropriation and asset value decline, particularly in emerging markets. In the United States, the collapse of major corporations like Enron, WorldCom, and Arthur Andersen exposed the severe consequences of weak corporate governance. These scandals led to the enactment of the Sarbanes-Oxley Act in 2002, aiming to restore public trust in corporate governance (Farewell, 2006). The act marked a significant shift in governance practices, particularly in enhancing board oversight and accountability. Corporate governance failures, particularly in the financial sector, have had far-reaching effects on economies, leading to plummeting equity values, credit rating declines, and even the threat of institutional survival

(Agrawal & Chadha, 2005). These failures emphasize the need for effective governance structures, especially concerning board composition and shareholding, to mitigate risks and ensure the stability of financial institutions like insurance companies. The growing recognition of the importance of board governance is reflected in key regulatory frameworks such as the Cadbury Report, the OECD principles, and the Sarbanes-Oxley Act, which have sought to address governance challenges and restore confidence in the financial markets. This study specifically investigates the relationship between board composition and board shareholding with risk management in the insurance sector in Saudi Arabia, aiming to understand how these governance elements influence the effectiveness of risk management practices.

The insurance industry in Saudi Arabia has undergone significant changes and expansion, though it has not yet grown to match the scale of the country's GDP (Orlando & Bace, 2021). A notable development was the introduction of mandatory insurance for all citizens and expatriates in 1999, alongside the establishment of the Cooperative Health Insurance (CCHI) to oversee health insurance. The sector is heavily influenced by Sharia law, which governs all insurance activities, including the widespread use of Takaful—a risk-sharing Islamic insurance model. The market remains highly concentrated, with two companies—Taiwunya & Bupa Arabia—holding over 50% of the market share. Saudi Arabia's insurance market, the largest in the GCC, consists of 32 companies, where the top six account for nearly 75% of the market's gross written premium (Orlando & Bace, 2021). Despite regulatory efforts to enhance solvency requirements and introduce actuarial pricing, the market faces challenges, including weak competition and significant risk concentration (Fadaak & Alghamadi, 2018). These dynamics underscore the need for reforms to improve the competitive landscape and ensure financial stability within the sector. As the market evolves, stronger regulatory oversight is crucial for maintaining stability and fostering confidence among stakeholders. Poor corporate governance and low transparency have been key factors in financial crises within the insurance sector (Norwani et al., 2011). The Saudi government has responded by implementing regulatory frameworks to improve governance and performance in financial institutions, including insurance companies (Alhabshan, 2017). However, the Saudi insurance sector continues to face challenges, as seen in the 52.8% decline in profits for some companies in 2021, partly due to the effects of the COVID-19 pandemic (Osman & Samontaray, 2021). Despite the importance of corporate governance in managing these risks, there is a noticeable gap in research on the impact of board composition and shareholding on risk management in Saudi insurance firms. Strong corporate governance, particularly in controlling financial resources and ensuring transparency, is essential for effective risk management. The lessons from the 2008 global financial crisis underscore the importance of such frameworks, as highlighted in the Solvency II scheme, which continues to guide risk management practices and ensure the stability of insurance companies (Alfiero & Venuti, 2016; Cerrone, 2020).

Over the past two decades, Saudi Arabia has made significant strides in corporate governance, particularly following the 2006 financial crisis. The crisis exposed weaknesses in the stock market, resulting in substantial losses for minority shareholders. In response, the Saudi government implemented robust corporate governance regulations, notably the Corporate Governance Regulations (CGR) introduced by the Capital Market Authority in 2003 and regularly updated to regulate financial markets (World Bank, 2009). However, challenges remain, as the implementation of these regulations is still in its infancy, and there are criticisms regarding their alignment with international standards (Alkhatani, 2016). The updated company law now incorporates global governance standards, addressing the responsibilities of the board of directors, shareholder rights, and transparency. The Saudi Regulatory Corporate Governance (SRCG) 2017 further introduced detailed guidelines on board composition, member qualifications, and the independence of the board of directors. Despite these improvements, the "comply or explain" feature of the regulations has led to inconsistent compliance across companies, particularly in the financial sector. Strengthening board governance remains critical for enhancing corporate performance and aligning with best practices, which are essential for

ensuring effective risk management in the insurance sector. Ineffective risk management in the insurance industry stems from several key issues: a lack of formalized procedures, inconsistency across project life cycles, and insufficient integration with critical processes like forecasting and supply chain management (Li et al., 2007). Additionally, limited expertise and a low perception of risk among insurers further exacerbate these challenges. Emerging risks, regulatory differences, and a rapidly changing business environment also introduce significant financial and reputational risks (KPMG, 2022). Effective board governance (BG) is essential for improving firm performance, managing agency costs, and mitigating litigation risks. Optimal board composition and shareholding can enhance shareholder value and ensure fair insurance premium distribution (Hermit, 2022). Despite the critical role of BG in strategic oversight and risk management, there is a notable gap in studies examining its impact on risk management practices in Saudi Arabia's insurance sector (Dhiab, 2021). Given the detrimental effects of poor governance highlighted by the global financial crisis, it is crucial to investigate how BG elements like board composition and shareholding influence risk management in Saudi insurance companies.

Therefore, this study seeks to understand the relationship between board governance aspects specifically board composition and board shareholding and risk management in the insurance industry in Saudi Arabia. The following are the research questions that guides this study: (i) How does board composition influence the risk management strategies employed by insurance companies in KSA? (ii) How does board shareholding influence the risk management strategies employed by insurance companies in KSA? The motivation for this study stems from the growing need to enhance corporate governance in the insurance sector in emerging economies like Saudi Arabia. While corporate governance and risk management have been extensively studied in the banking sector, the insurance industry remains under-researched, especially in the context of corporate governance's role in managing critical risks such as insurance risk, credit risk, and liquidity risk. Saudi Arabia's insurance sector faces unique challenges due to its concentrated ownership structures and evolving regulatory environment. With the country's Vision 2030 initiative pushing for economic reforms and greater corporate transparency, there is an urgent need to understand how governance practices in this sector can be improved. This study aims to fill the gap by examining the relationship between board governance practices and risk management, offering valuable insights into whether existing governance frameworks are effective in mitigating risk and ensuring the long-term financial stability of Saudi insurance firms. This study's significance lies in its contribution to both academic research and practical governance reforms in the insurance sector. Academically, it extends the existing literature on corporate governance and risk management by focusing on Saudi Arabia's insurance industry, an area that has received limited attention. By examining how board composition and shareholding influence the management of key risks (insurance, credit, and liquidity) this research adds important empirical evidence on the effectiveness of governance in emerging markets. Practically, the findings provide actionable insights for policymakers and regulators in Saudi Arabia, where economic reforms under Vision 2030 demand greater transparency and accountability in corporate governance. The results of this study can guide regulatory bodies in improving governance standards, while also helping insurance firms restructure their boards to align with best practices. This will ultimately enhance risk management capabilities and ensure the sector's long-term sustainability amidst ongoing economic transformations.

Literature Review and Theoretical framework
Corporate governance has gained significant attention, particularly since the 1990s, driven by mergers, takeovers, and the need for improved corporate practices. It is a key determinant of corporate performance, enhancing shareholder confidence and reducing fraud (Guluma, 2021). Definitions of corporate governance vary, but it generally refers to the mechanisms that oversee how organizations are managed, aiming to balance the interests of various stakeholders (Shleifer & Vishny, 1997). The principles of corporate governance are rooted in business ethics and vary by country. The OECD principles (1999) promote shareholder equality, transparency, and

accountability, forming the basis of corporate governance globally. In Saudi Arabia, the Saudi Arabian Monetary Agency (SAMA) has adopted principles to enhance governance in financial institutions, focusing on board qualifications, responsibilities, and shareholder rights (Al-Faryan & Saleh, 2020). Different corporate governance models exist based on regional characteristics. The Anglo-Saxon Model is prevalent in the UK and US. This model focuses on shareholder value, with diverse ownership and limited shareholder influence on management (Cernat, 2004). On the other hand, the European model is common in Europe. The model includes all stakeholders, emphasizing long-term relationships between companies and banks (Alnemer, 2015). Sharia'h Model is rooted in Islamic principles, this model prohibits interest-based transactions and emphasizes ethical business practices (Grais & Pellegrini, 2006). Lastly, Takaful Model is a variant of the Sharia'h model and it involves mutual risk-sharing among participants, governed by strict ethical guidelines to prevent conflicts of interest (Archer et al., 2009). The study is grounded in four key theories including the agency theory, stakeholder theory, stewardship theory and the resource dependency theory. Agency Theory focuses on the conflicts between principals (shareholders) and agents (managers), advocating for monitoring mechanisms to align interests (Jensen & Meckling, 1976). Stakeholder Theory asserts the need for governance to address the interests of all stakeholders, not just shareholders (Donaldson & Preston, 1995). Additionally, stewardship theory Suggests that managers act as stewards, motivated by organizational success rather than personal gain, promoting trust-based governance (Davis et al., 1997). Lastly, the Resource Dependency Theory highlights the board's role in managing external dependencies, with board composition reflecting the need for diverse resources and inter-organizational connections (Pfeffer, 1972).

Board governance in the insurance sector is a comprehensive system that regulates insurance companies internally, encompassing various aspects such as corporate culture, ethics, board structure, and compliance with regulations (Dodevska & Nuredini, 2019). This governance system ensures that responsibilities and obligations are clearly defined and disclosed to stakeholders, providing a framework for effective oversight, risk management, and compliance. Effective board governance in insurance firms promotes a balance between the needs of internal management and shareholders, ensuring that power is not overly concentrated and that checks and balances are maintained. A well-governed insurance company benefits from increased competitiveness, enhanced efficiency, improved asset value, and a stronger reputation (Al-Faryan & Alokla, 2023). For the Saudi insurance sector, strong board governance is crucial, particularly in managing the relationship between board composition, shareholding, and risk management. Ensuring that governance structures support both shareholder protection and the independence of the organization is essential for maintaining stability and mitigating risks within the industry. Risk management is essential for long-term corporate viability. Effective risk management involves identifying, measuring, monitoring, and mitigating risks using established frameworks like COSO and ISO 31000:2009. The 2008 financial crisis highlighted the need for integrating risk management into corporate governance to address complex risks (Aebi et al., 2012). Risks in the insurance industry are categorized as financial and non-financial. Financial risks include credit, liquidity, operational, and actuarial risks, which directly impact the financial stability of insurance firms (Santomero & Babbel, 1997). On the other hand, non-financial risks encompass environmental and social risks that affect business sustainability (Welford, 1999). Risk disclosure is crucial for stakeholder decision-making and varies in quality and format. High-quality disclosure improves transparency and reduces uncertainty for investors (Linsmeier et al., 2002). Effective risk management in insurance requires a robust system for identifying, assessing, and reporting risks. The Solvency II framework offers guidelines, but successful implementation depends on skilled professionals and a strong risk culture (Marano & Grima, 2022).

Insurance risk, credit risk and liquidity risk are selected as the dependent variable for the study since they are central risks to the operations of insurance firms in Saudi Arabia and directly impact their financial health and stability. Insurance risk is inherent to the primary business of

insurance firms since it involves the likelihood of policyholders filing claims that could influence the company's financial health. Studies have demonstrated that effective corporate governance structures play a crucial role in controlling and monitoring insurance risk. Magee et al., (2019) revealed that insurance companies with strong risk governance tend to have lower insurance risk and are less likely to default during crisis period. On the other hand, credit risk refers to the risk of a company defaulting its obligations which is a dominant concern among financial institutions including insurance companies. Studies have demonstrated that corporate governance mechanisms such as board independence play an essential role in managing credit risk. For instance, Aslam and Haron (2021) revealed that larger boards with greater independence are associated with lower credit and liquidity risk. On the other hand, liquidity risk is essential in the insurance industry and is a determinant of the ability of the company to meet its short-term needs. Djebali and Zaghudi (2019) stressed the role played by corporate governance in managing both credit risk and corporate risk. Board composition refers to the ratio of outside (non-executive) directors to inside directors on a company's board (Al-Faryan, 2020). The literature extensively discusses the benefits of having independent directors, emphasizing their role in enhancing corporate governance. Independent boards are associated with better firm performance due to their ability to monitor management effectively and reduce agency problems (Denis & McConnell, 2003; Claessens & Yurtoglu, 2013). In environments with weak legal and regulatory frameworks, board independence serves as a safeguard for minority shareholders' rights. However, some studies argue that the influence of outside directors may be limited if they rely on potentially biased information provided by management (Mace, 1986; Patton & Baker, 1987). Despite this, independent directors are legally and morally obligated to provide unbiased evaluations and protect shareholders' interests, often incentivized to perform their duties with integrity (Fama & Jensen, 1983). Empirical evidence shows that boards with a higher proportion of independent directors are more likely to challenge poor performance and dismiss underperforming CEOs (Weisbach, 1988). In Saudi Arabia, the Saudi Corporate Governance Regulations (SCGRs) emphasize the importance of board independence to protect shareholders and promote transparency. Additionally, Saudi banking regulations mandate that at least two board members must be outside directors, underscoring the recognized role of independent directors in effective governance and risk management. Furthermore, Beasley et al., (2023) highlights that favorable board composition-related characteristics such as independent board members who have the required financial expertise are negative associated with reporting risks. These characteristics of the board members minimize the financial risk reporting by ensuring that the board members have the required skills to assess the reasonableness of a risk and ensures that the board questions the objectivity of the management when necessary. Furthermore, a study conducted by Adelopo et al., (2021) on UK-listed companies for the period 2006-2015 revealed that firms that boards that were more independent and larger were more likely to adhere to established risk management regulations such as risk disclosure during years of corporate uncertainty. Similarly, Muhammed and Nurullia (2021) revealed that there was a positive significant impact of independent directors and corporate risk management in Indonesian and Singapore companies. The study found that independent board of commissioners are effective in reducing agency problems between the shareholders and the management. Additionally, independent board members are responsible for providing protection to the interests of the company's shareholders. According to Younas et al., (2019) reveals that the proportion of independent board members in a board has a strong influence on the company's behavior. Under the agency theory, managers are likely to maximize their personal utility by breaking from the contract between principal and agent. These opportunistic and self-centered behaviors are associated with more risk-taking by companies. However, the risk emanating from self-centered behavior that may be adopted by managers can be countered through the implementation of monitoring mechanisms. Since unhealthy risk taking is not in the best-interest of the shareholders, independent directors can effectively provide control for it through monitoring. Akbar et al., (2017) highlights that a greater presence of independent directors is associated with less corporate risk taking. Additionally, the capability of a board to efficiently

perform its monitoring roles is directly linked with the independence of its board structure (Westphal, 1998). A study by Younas et al., (2019) investigating the relationship between board composition and risk management in the US and Germany revealed that there is a significant negative relationship between corporate risk-taking and an independent board structure in Germany and also in the USA. Specifically, the study found out that a decrease in the level of independent board of directors in firms in Germany by 0.557 led to an increase of corporate risk-taking in Germany firms (the stock return volatility) by 1%. Despite there being a rich literature on the relationship between board composition and risk management, studies specifically examining the relationship in the Saudi insurance sector are limited, creating a gap that this research aims to address. In light of the literature, the hypotheses proposed relating to the first objective of the study is:

H1: *There is a significant positive relationship between board composition and risk management in the insurance sector in KSA.*

Board shareholding refers to the ownership of voting and controlling shares by board members, which influences their voting power and cash flow rights within a company (Okolie & Uwejeyan, 2022). This structure can take various forms, including block holders, managerial ownership, family ownership, and institutional ownership. The literature indicates that board shareholding can have both positive and negative impacts on corporate governance and risk management, depending on the type of ownership and the context. Board shareholding refers to the ownership stakes that board members hold in the company. The literature indicates that when board members hold significant shares, their interests align more closely with those of the shareholders, potentially leading to better risk management (Hermalin & Weisbach, 2003). However, excessive shareholding can also result in conflicts of interest, where personal gain may be prioritized over effective risk mitigation. The existing research on this dynamic within KSA's insurance sector is sparse, particularly in understanding how it influences risk management outcomes.

Board shareholding may include foreign and institutional ownership, concentrated ownership, block holders and family ownership. In foreign and institutional ownership, foreign investors, who often demand higher levels of information due to greater information asymmetry, have been shown to enhance corporate governance by providing better monitoring and reducing the impact of financial crises (Suto, 2003; Baek et al., 2004). Institutional investors, particularly in KSA, play a significant role in corporate governance through their monitoring functions, which are crucial during times of crisis (Jebran & Chen, 2021). On the other hand, Concentrated ownership, where a small group holds a significant portion of shares, presents mixed effects. While some owners may discipline management to protect the firm during crises, others may engage in opportunistic behavior, as seen during the Asian financial crisis (Essen et al., 2013). In particular, when ownership is concentrated among managers or families, there is a risk of prioritizing personal wealth over the company's long-term value (Lemmon & Lins, 2003). Furthermore, block holders, who own a substantial number of shares, can positively influence corporate governance by enhancing oversight and reducing agency conflicts (Jebran & Chen, 2021). However, some block holders may adopt strategies that are detrimental during financial crises, such as using their influence to pursue exit strategies (Bharath et al., 2013). Additionally, family ownership in KSA shows a dual impact. On one hand, dominant family shareholders may exploit minority shareholders during crises. On the other hand, families may also contribute personal resources to ensure the long-term survival of the firm, making family ownership a complex variable in corporate governance and risk management (Villalonga & Amit, 2010). Existing empirical studies have established the relationship between board shareholding and the adoption of risk management strategies. Beasley et al., (2023) highlights that board ownership has a positive influence on risk management. This is due to the fact that in cases where the board members have considerable ownership stakes, they are more likely to adapt robust risk management practices. Additionally, Pathan et al., (2021) highlights that companies that have higher long-term shareholding structures are likely to adopt more conservative risk management practices and

reduce the overall risk profile of the company. Furthermore, Rehman et al., (2021) revealed that firms with foreign or institutional ownership were more likely to are likely to implement more robust risk management frameworks leading to enhanced financial outcomes. Therefore, based on the literature, board shareholding may either exacerbate or mitigate risk based on the ownership structures and external factors the organization faces. Based on the literature, the hypothesis raised on the relationship between board shareholding and risk management is:

H2: There is a significant relationship between board shareholding and risk management in the insurance sector in KSA

Table 1: Summary of empirical Literature Review

Author(s)	Focus of the Study	Main Findings	Limitations (Research Gaps)	How Gaps are Addressed in Current Study
Alshehhi (2023)	The study analyses the efficacy of risk management governance, specifically in the form of a dedicated risk governance committee and the executive board with the Chief Risk Officer (CRO). The focus is on identifying critical aspects of risk management and governance that are crucial for the financial performance of banks. The study emphasizes the role of risk management and governance in achieving financial sustainability.	The study indicates that the financial performance, measured using returns ratio, significantly differs among banks based on the presence or absence of a CRO on the executive board. The study suggests a positive and significant impact of the bank's corporate governance variables on financial performance. It concludes that effective risk governance can lead to sustainable financial performance.	There may be limitations in generalizing the findings beyond the studied South Asian economies, and the focus on banks might not capture the dynamics of risk management governance in other financial institutions such as Saudi Arabia. Additionally, the study considers only one variable of corporate governance which is the Chief Risk Officer (CRO). Additionally, the study focuses on financial performance rather than risk management.	The current study broadens the analysis to consider diverse corporate governance elements specific to the insurance industry. By adopting a quantitative research approach and utilizing empirical data from the Saudi Arabian insurance sector, the study aims to provide insights into the relationships between various aspects of corporate governance and risk management practices within this specific context. Furthermore, the study focuses solely on risk management.
Singhania et al., (2022)	The focus is on recognizing the importance of sound corporate governance mechanisms in addressing risks, particularly in the context of extremities, insolvencies, and enterprise collapses especially in the global financial crisis of 2007-2008.	The study revealed that sound corporate governance is a crucial tool for risk management especially during extremities, insolvencies and enterprise collapses.	The limitations of the study include potential biases inherent in bibliometric analyses, such as the reliance on available literature in the Scopus database. While the study provides insights into intellectual developments, it may not capture emerging research that is not yet widely cited. Additionally, the study focuses on the theoretical aspects of corporate governance and risk management, and there might be limitations in addressing practical implementation challenges or industry-specific complexities.	The study goes beyond theoretical developments by examining practical implications and relationships within the specific context of the Saudi Arabian insurance sector. Instead of relying solely on bibliometric analyses, the current study incorporates empirical data and quantitative research methods to assess the actual relationships between corporate governance elements and risk management practices in the insurance industry. Additionally, the study is more reliable since it is not biased on a short period of time like one year but covers a period of ten years.
Boshnak et al., (2023)	The study examines the impact of corporate governance mechanisms on the performance of listed firms in Saudi Arabia, specifically before and during the COVID-19 pandemic. The study employs univariate, bivariate, and multivariate	The main findings of the study indicate that during the COVID-19 pandemic, firm market performance (measured by Tobin's Q ratio) decreased with larger board size and more board meetings. Conversely, it increased with board experience,	Potential biases in the data collected from annual reports, and the study's focus on the COVID-19 pandemic might limit generalizability to other crisis contexts. Additionally, the study's timeframe covers a specific period (2019 to 2020), and the implications drawn may not extend to	The current study narrows its focus to the insurance sector in Saudi Arabia, providing insights tailored to the unique dynamics of this industry. Unlike the study's concentration on financial performance, the current study places a primary emphasis on risk

analyses on data collected from 258 annual reports spanning 2019 to 2020.	board education, and board gender diversity (number of women on the board). Notably, board gender was found to have a significant positive impact on the firm's operational performance (return on assets) during the COVID-19 pandemic, suggesting that gender diversity on boards plays a crucial role in times of crisis.	long-term effects. While the study identifies the impact of corporate governance mechanisms, it may not comprehensively capture all potential factors influencing firm performance during a crisis. Furthermore, the study fails to cover the variables for risk management but rather focuses on financial performance during the Covid19 period.	management practices within the insurance sector. -The current study spans a more extended period of 10 years (2013-2022), allowing for a comprehensive examination of the relationships between corporate governance and risk management practices over time, beyond the confines of the COVID-19 period.

The empirical relationship between corporate governance and risk management has produced mixed and inconclusive results. Previous studies often focus on isolated characteristics of corporate governance, such as board composition or independence, without considering the full spectrum of board attributes. This study, however, aims to comprehensively investigate multiple aspects of board governance, specifically focusing on the impact of board composition and board shareholding on risk management in the Saudi insurance sector. The existing literature presents theoretical and methodological gaps, with varying results across different studies. Some research shows positive relationships, others negative, or no relationship at all between governance and risk management. These inconsistencies may arise from differences in the variables used, market environments, and methodological approaches. Furthermore, there is a significant gap in literature exploring corporate governance's impact on risk management within the insurance sector in Saudi Arabia and the broader Middle East. Most studies have been conducted in developed economies, where the market dynamics, legal frameworks, and regulatory environments differ substantially from those in KSA. Given these differences and the conflicting findings in existing research, there is a clear need for further investigation into how board composition and board shareholding influence risk management in the Saudi insurance industry.

Research Methodology
This research adopted a quantitative research design due to its strengths in statistical analysis, reliability, and the ability to generalize findings (Hussey & Hussey, 2009; Berg, 2004; Bryman, 2012). The quantitative method is particularly suited for investigating large samples over extended periods, making it ideal for this study's focus on the insurance sector in Saudi Arabia. Given the limitations of qualitative methods, such as small sample sizes and time-consuming data collection, the study adopts a quantitative approach. Furthermore, the study adopts a deductive positivism approach. This approach relies on pre-existing theories to develop hypotheses, which are then tested empirically. The primary analytical tool used in this study is multiple regression analysis, which is effective for examining the relationships between board composition, board shareholding, and risk management (Hair et al., 2009). Multiple regression is chosen due to its proven effectiveness in similar research contexts, allowing the study to analyze the impact of the selected governance variables on risk management outcomes in the Saudi insurance sector (Anderson & Reeb, 2003; Claessens et al., 2006).

The study adopts a positivism philosophy, which is well-suited for objectively examining quantifiable aspects of corporate governance and risk management. A cross-sectional descriptive research design is employed, focusing on data from the twenty-seven insurance companies listed on the Saudi stock exchange. This design allows for the collection of data at a single point in time, providing a clear snapshot of the current relationships between the key variables. Data was collected from secondary sources. The secondary data was sourced from publicly available annual reports and financial statements. The study analyzed the variables of board composition and board shareholding in relation to various dimensions of risk management including insurance risk, credit risk, and liquidity risk. Correlation and regression analyses are used to

evaluate the relationships between these variables, providing insights into the impact of corporate governance on risk management in the Saudi insurance sector.

The independent variables of the study include board composition and board shareholding. Board composition refers to the ratio of independent (non-executive) directors to inside directors on the board and is used to measure the diversity and independence of board oversight. On the other hand, board shareholding refers to the ownership stakes held by board members, influencing their control over the company and alignment with shareholder interests. These governance variables are analyzed in relation to various dimensions of risk management, such as insurance risk, credit risk, and liquidity risk. The study employs these variables to assess how internal governance mechanisms, particularly board composition and shareholding, impact the effectiveness of risk management in Saudi Arabia's insurance sector. Board Composition (Bcomp) and Board Shareholding (Bshare) were used as the proxy variables for corporate governance. Board Composition (Bcomp) was measured as the ratio of non-executive board members to the total number of directors. Pathan (2013) emphasizes that the only relationship between the business and the non-executive director should be business-oriented. This means that non-executive members are not former employees of the institution, its family members, and do not have any significant ties with the business. Researchers have frequently used this variable as a proxy for corporate governance (Aebi et al., 2012; Durgavanshi, 2014; Pan, 2014; Rachdi & Ameur, 2011). Board Shareholding (Bshare) was measured by analyzing the ownership records of each individual board member within the insurance companies. Ownership information, including the number of shares held by each board member, was retrieved from board reports and financial disclosure reports published by the insurance companies, offering a comprehensive view of the extent of board shareholding in each company.

Data analysis refers to the application of reasoning to interpret collected data, identifying consistent patterns, and summarizing findings (Zikmund et al., 2013). The process includes four key steps: preparing the data for analysis, visualizing data through descriptive statistics, conducting goodness-of-fit tests, and finally, testing the hypotheses (Sekaran, 2006). The Statistical Package for Social Sciences (SPSS) version 27 was used for this study's data analysis. To examine the relationship between board governance (specifically board composition and board shareholding) and risk management, the study employed correlation and hierarchical multiple regression analyses. The Baron and Kenny (1986) approach was used to assess the effect of firm characteristics on the relationship between corporate governance and risk management. Multiple regression analysis was further used to evaluate the combined effect of corporate governance and firm characteristics on risk management. This analytical approach aligns with previous studies that have tested the main effects, moderation, and joint effects in corporate governance research (Klein et al., 2005; Tandelilin et al., 2007; Rogers, 2006). Hierarchical multiple regression model was utilized to determine the relationship between board composition and risk management in the insurance sector in Saudi Arabia. The following multiple regression models were utilized to test hypothesis one of the studies. The first equation (model 1) included only the control variables (firm age and firm size) while the second equation (model 2) integrated the independent variable (board independence) together with the control variables as shown below:

$$RMi\ =\ \beta0 + \beta1\text{Firm Age} + \beta2\text{Firm Size} + \epsilon \dots\dots\dots\dots\dots\dots\dots\dots\dots.\dots\dots (4.1)$$
$$RMi\ =\ \beta0 + \beta1\text{Firm Age} + \beta2\text{Firm Size} + \beta3\text{BComp} + \epsilon \dots\dots\dots\dots\dots. (4.2)$$

Where;

RMi Risk management attribute i (i=1 to 3; i2 =insurance risk, i2=credit risk, i3=liquidity risk)

β0 is the regression constant or intercept

βi is the regression coefficient of variable i

Bcomp is the board Composition

£I is a random error term that accounts for the unexplained variations.

Regression analysis was conducted to assess the relationship between board shareholding and risk management as demonstrated by equation below:

$$RMi = \beta 0 + \beta 1 \text{Firm Age} + \beta 2 \text{Firm Size} + \epsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.3)$$

$$RMi = \beta 0 + \beta 1 \text{Firm Age} + \beta 2 \text{Firm Size} + \beta 3 \text{Bshare} + \epsilon. \ldots\ldots\ldots\ldots\ldots\ldots (4.4)$$

Where;

RMi Risk management attribute i (i=1 to 3; i1 =insurance risk, i2=credit risk, i3=liquidity risk)

β0 is the regression constant or intercept

βi is the regression coefficient of variable I

Bshare is board shareholding

Results and Discussion

Descriptive Statistics

To obtain a summary of the independent, control and the dependent variables descriptives statistics such as the mean, standard deviation, skewness and kurtosis were obtained. The descriptive statistics provide an overview of board composition, board shareholding, firm age, firm size, insurance, liquidity and credit risk providing insights into the governance structures and risk profile of insurance companies in Saudi Arabia. The results are presented in table 2.

Table 2: *Descriptive Statistics*

Variable	N	Mean	Std. Deviation	Variance	Skewness	Kurtosis Std. Error	Statistic	Std. Error
Board Composition	270	0.444	0.15	0.023	-0.125	0.148	-1.068	0.295
board shareholding	270	0.10103	0.274365	0.075	10.955	0.148	152.34	0.295
Firm Age	270	18.28	14.112	199.155	1.365	0.148	0.624	0.295
firm size	270	9.056604	0.544188	0.296	-1.043	0.148	10.813	0.295
Insurance Risk	270	0.02706	0.014386	0	1.235	0.148	0.893	0.295
Liquidity Risk	270	0.31352	0.176846	0.031	0.787	0.148	-0.12	0.295
Credit Risk	270	0.24169	0.09694	0.009	1.19	0.148	0.573	0.295
Valid N (listwise)	270							

Table 2 shows that the mean ratio of non-executive board members to the total number of directors is 0.444, indicating that approximately 44.4% of the board members in the Saudi insurance sector are non-executives. The standard deviation of 0.15 reflects moderate variation, while the skewness of -0.125 suggests a slight skew towards lower values, indicating that more boards have fewer non-executive directors than the mean. The kurtosis of -1.068 indicates a platykurtic distribution, with fewer outliers than a normal distribution. These statistics suggest that the insurance companies in Saudi Arabia generally comply with the corporate governance regulations set by the Capital Market Authority (CMA), which require a majority of non-executive directors on the board. The findings align with similar governance practices observed in other countries, such as Sri Lanka, where compliance with non-executive director requirements is also high. This analysis supports the study's focus on the relationship between board composition and risk management, showing that a significant proportion of non-executive directors is a common feature in the governance structure of Saudi insurance firms.

The analysis shows that the mean proportion of shares held by board members in Saudi insurance companies is 10.1%, with a high standard deviation of 0.274, indicating significant variability in board shareholding. The skewness of 10.955 reflects a highly positively skewed distribution, where most board members hold few shares, while a few hold significantly larger amounts. The kurtosis of 152.34 indicates a leptokurtic distribution, pointing to the presence of extreme outliers. In Saudi Arabia, there are no specific regulations regarding the number of shares that board members can own. However, literature suggests that when board members hold substantial shares, it can lead to agency problems, with dominant shareholders potentially expropriating value from minority shareholders (La Porta et al., 1999). High ownership concentration is also associated with increased risk, as it may reduce adherence to good governance practices (Shah et al., 2012). Therefore, the relatively low level of board shareholding

observed in KSA's insurance sector may help mitigate these risks. This analysis supports the study's examination of the relationship between board shareholding and risk management, suggesting that lower levels of board shareholding could be beneficial in reducing governance-related risks in the Saudi insurance industry. The analysis of insurance risk over a 10-year period for Saudi insurance companies shows a mean value of 0.02706, indicating a generally low level of insurance risk across the sector. The standard deviation of 0.014386 reflects minimal variation, while the variance is effectively 0, indicating very low dispersion around the mean. The skewness of 1.235 suggests a rightward skew, meaning most companies experience low insurance risk, but a few have significantly higher levels. The kurtosis of 0.893 indicates a slightly more peaked distribution than normal, with a moderate presence of outliers. These statistics suggest that the insurance risk in Saudi companies is generally low, with only a few firms experiencing higher levels of risk. This information is crucial for understanding the broader context in which board composition and shareholding impact risk management practices in the Saudi insurance sector. The mean credit risk is 0.24169, indicating that, on average, firms face moderate credit risk. The standard deviation is 0.09694, showing moderate variability around the mean. The variance is 0.009, reflecting some dispersion. The skewness of 1.19 indicates a rightward skew, meaning most firms experience lower credit risk, but a few have significantly higher credit risk. The kurtosis of 0.573 suggests a distribution that is slightly more peaked than normal, indicating a moderate presence of outliers. These results align with the findings of Orlando and Bace (2021) who reveals that the Saudi insurance market is judged to have a moderate risk in credit ratings which is in line with most GCC countries (Toskas & Coutts, 2020). Table 6.1 illustrates that during the 10-year period, insurance companies in KSA experienced a moderate level (0.235) of liquidity risk over the period. The standard deviation of 0.6734 indicates considerable variability, highlighting fluctuations in liquidity levels among insurers. The positive skewness of 0.454 suggests a rightward tail in the distribution, indicating a tendency for occasional higher liquidity risk instances. The kurtosis value of 9.052 suggests that there is a leptokurtic distribution hence the presence of outliers and a higher probability of extreme values. Saudi Arabia does not provide specific guidelines on the level of liquidity risk that these companies are expected to maintain. However, the statistics relating to liquidity risk in KSA are considerably low and raise no need for alarm.

Diagnostic tests
The classical linear regression is based on several assumptions including linear relationship, multivariate normality, no or little multi collinearity absence of auto-correlation and homoscedasticity. Multiple linear regression was conducted to test the assumptions on the variables in the study. Linear regression analysis requires that there is little or no autocorrelation in the data. Autocorrelation occurs when the residuals are not independent from each other. A violation of this assumption is an indicator that the model could be improved and even in extreme cases of violation and indicator of mis-specified values. The Durbin-Watson (1951) statistic was used to test the autocorrelation in the panel data. According to Flatt and Jacobs (2019), the Durbin Watson statistic is a test of significant residual autocorrelation at Lag 1. In Ideal situations, the statistic should be close to 2. The results are as presented in table 3.

Table 3: *Model Summary and Durbin-Watson Statistics for Independence Test Results*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
Board composition	.907a	0.823	0.823	0.006058	1.537
Board shareholding	.014a	0	-0.004	0.014411	1.543
b Dependent Variable: Composite Risk					

Table 3 presents the results of the independence test using the Durbin-Watson statistic for the various governance variables. For Board Composition, the adjusted R^2 is 0.823 with a Durbin-Watson statistic (d) of 1.537, indicating no first-order linear autocorrelation within the critical

range. For Board Shareholding, the adjusted R^2 is -0.004 with a Durbin-Watson statistic (d) of 1.543, also indicating no first-order linear autocorrelation.

Table 4: *ANOVA Test Results for Linearity of Board Governance Variables*

			Sum of Squares	df	Mean Square	F	Sig.
Board Composition	Between Groups	(Combined)	0.052	57	0.001	58.895	0
		Linearity	0.046	1	0.046	2938.439	0
		Deviation from Linearity	0.007	56	0	7.474	0
	Within Groups		0.003	212	0		
	Total		0.056	269			
board shareholding	Between Groups	(Combined)	0.054	177	0	14.241	0
		Linearity	0	1	0	0.5	0.481
		Deviation from Linearity	0.054	176	0	14.319	0
	Within Groups		0.002	92	0		
	Total		0.056	269			

Multicollinearity occurs when two or more predictors in a regression model are highly correlated, leading to unreliable p-values and potentially misleading interpretations (Vatcheva et al., 2016). The Variance Inflation Factor (VIF) test was used to assess multicollinearity in this study. A VIF value of 1 indicates no multicollinearity, while values above 1 suggest increasing multicollinearity. A VIF exceeding 5 is considered high, indicating significant multicollinearity, which could distort the analysis. The tolerance value, being the reciprocal of VIF, should ideally be above 0.1; values below this threshold signal substantial multicollinearity. The results indicate that the VIF values for the predictors, including board composition and board shareholding, are within acceptable limits, showing no significant multicollinearity. This suggests that the regression models used to analyze the relationship between board governance factors and risk management are robust and reliable, supporting the validity of the study's findings related to the hypotheses on board composition and board shareholding. These results ensure that the conclusions drawn regarding the impact of board composition and board shareholding on risk management in the Saudi insurance sector are based on stable and reliable statistical models, free from significant multicollinearity issues.

Table 5: *Multicollinearity test results for the Regression models*

| Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.063	0.006		10.097	0		
Firm Age	4.40E-06	0	0.004	0.165	0.869	0.972	1.029
firm size	0	0.001	0.013	0.487	0.626	0.981	1.019
Board Composition	-0.087	0.003	-0.908	-34.457	0	0.955	1.047
(Constant)	0.055	0.015		3.605	0		
Firm Age	0	0	0.158	2.63	0.009	0.997	1.003
firm size	-0.003	0.002	-0.127	-2.019	0.044	0.909	1.1
board shareholding	-0.003	0.003	-0.06	-0.949	0.344	0.907	1.102
a Dependent Variable: Composite Risk							

The multicollinearity test results in Table 5 show that all predictor variables, including Board Composition and Board Shareholding, have Variance Inflation Factor (VIF) scores well below 5, ranging from 1.019 to 1.102. These low VIF scores suggest that multicollinearity is not a concern in this study. The tolerance values, which range from 0.907 to 0.997, further confirm that each predictor shares less than 10% of its variance with others. This indicates that the regression coefficients are stable and reliable, allowing for accurate interpretation of the relationships between the predictors and risk management outcomes. These findings confirm that the assumption of minimal multicollinearity is met, ensuring the validity of the regression analysis results related to the impact of Board Composition and Board Shareholding on risk management in the Saudi insurance sector.

Heteroscedasticity refers to the systematic change in the variance of residuals across the range of measured values, which can be problematic for regression analysis as Ordinary Least Squares (OLS) assumes constant variance of residuals (homoscedasticity). To ensure this assumption was met, homoscedasticity was tested using various methods including histograms, scatterplots, and normal P-P plots. The data was split into high and low values to evaluate if there were significant differences in the variances between these groups. Additionally, Levene's test was employed to verify that the variances of the populations from which the samples were drawn were equal. These tests collectively help to confirm whether the residuals have a constant variance, ensuring the validity of the regression models used to assess the relationship between board composition, board shareholding, and risk management in the Saudi insurance sector.
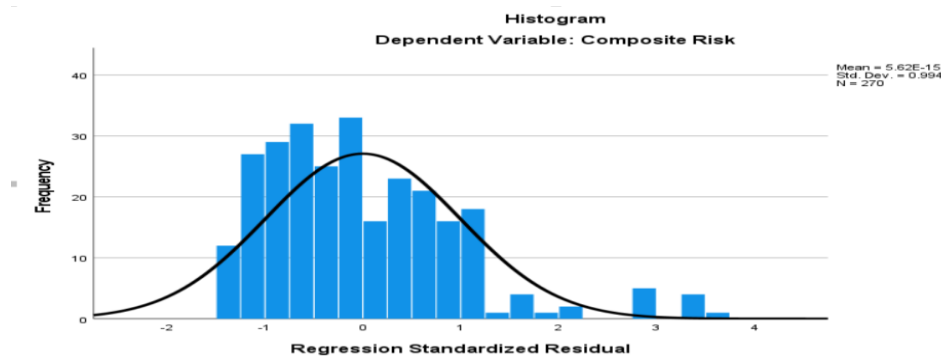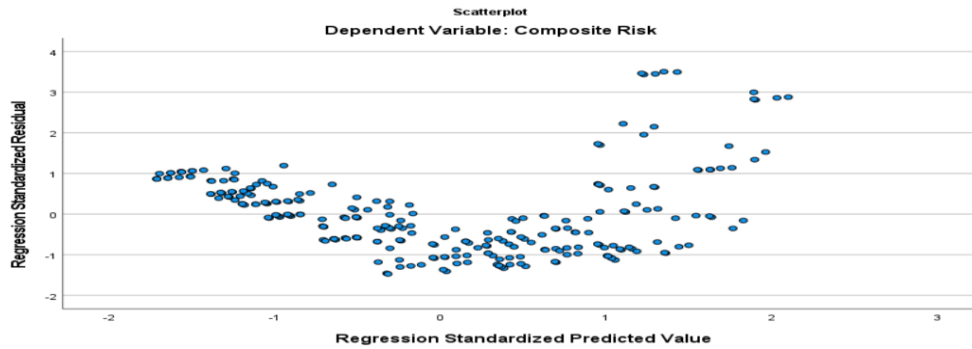

Figure 1: *Histogram of Regression Standardized Residuals for Composite Risk*

The histogram of the regression standardized residuals presented in figure 1 above shows a roughly normal distribution, centered around zero. The presence of a single peak and symmetry around the center suggest that the residuals are normally distributed. Therefore, there is no evidence of heteroscedasticity.
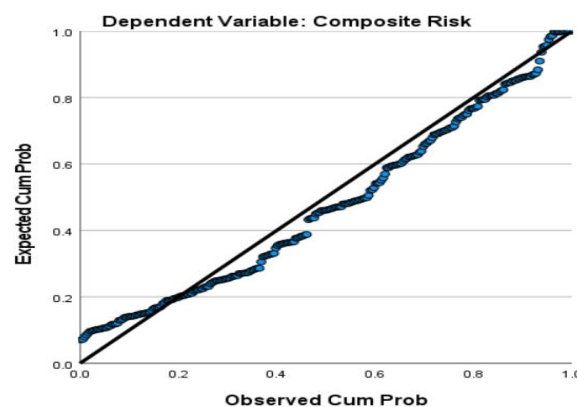
Figure 2: *Normal P-P Plot of Regression Standardized Residuals for Composite Risk*

Figure 2 above presents a normal P-P plot comparing the cumulative probability of the observed residuals to the expected cumulative probability under a normal distribution. The points closely follow the diagonal line, indicating that the residuals are normally distributed. This supports the assumption of homoscedasticity as it suggests that the errors have constant variance across the range of predicted values.

Figure 3: *Scatter Plot of Regression Standardized Residuals versus Predicted Values for Composite Risk*

Figure 3 above presents the scatter plot of the regression standardized residuals versus the standardized predicted values for the board composition regression model necessary for assessing heteroscedasticity. In ideal situations, the results should be scattered around zero with no specific pattern. In the scatterplot presented in the above diagram, e residuals appear to be randomly dispersed, suggesting that there is no clear pattern of increasing or decreasing variance. This randomness supports the assumption of homoscedasticity, indicating that the variance of the residuals remains constant across different levels of predicted values.

Table 6: *Test of homogeneity of Variance for risk management results*

	Levene Statistic	df1	df2	Sig.	F	Sig.
Board composition	1.018	46	125.093	0.455	1.348	0.068
Board shareholding	4.176	51	6.9	0.028	9.345	0

Table 6 above presents the results of the Levene's Test for homogeneity of variance for the risk management variables. The significance value for Board Composition is 0.455 (Levene Statistic = 1.018), which is greater than 0.05, indicating no evidence of heteroscedasticity, and thus the variances are equal across groups. For Board Independence, the significance value is 0.712 (Levene Statistic = 0.863), also greater than 0.05, suggesting homogeneity of variances. However, for Board Shareholding, the significance value is 0.028 (Levene Statistic = 4.176), which is less than 0.05, indicating the presence of heteroscedasticity. Lastly, the Expertise of the Risk Management Committee shows a significance value of 0.620 (Levene Statistic = 0.926), greater than 0.05, implying no evidence of heteroscedasticity and thus homogeneity of variances. Overall, except for Board Shareholding, the risk management variables meet the assumption of homogeneity of variances.

Regression analysis assumes that the error terms are normally distributed, which is essential for the validity of p-values in t-tests (Flatt & Jacobs, 2019). Violating this assumption can distort confidence intervals and make it difficult to accurately determine the significance of model coefficients (Nau, 2018). A violation might indicate the presence of unusual data points or suggest that the model needs refinement. The normality of the error terms was tested to ensure the reliability of the regression analysis. Ensuring normal distribution of errors supports the validity of the conclusions drawn about the relationships between board composition, board shareholding, and risk management in the Saudi insurance sector.

Table 7: *Normality Test Results for Variables Related to Board Governance*

	Tests of Normality					
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Board Composition	0.077	270	0.001	0.965	270	0
board shareholding	0.356	270	0	0.313	270	0
a Lilliefors Significance Correction						

The results in table 7 show that all board governance variables, including board composition, board independence, board shareholding, and the expertise of the risk management committee, significantly deviate from normality. The Kolmogorov-Smirnov and Shapiro-Wilk tests both return p-values of 0, indicating non-normal distributions for each variable. However, this non-normality is not considered critical due to the large sample size of 270 observations. According to the Central Limit Theorem, the distribution of sample means will be approximately normal if the sample size is sufficiently large, typically 100 or more observations (Gupta et al., 2019). Therefore, despite the non-normality, the large sample size ensures that the regression analysis remains valid for evaluating the relationships between board governance variables and risk management in the Saudi insurance sector. The diagnostic tests conducted in the study validated the key assumptions necessary for reliable regression analysis. The Durbin-Watson statistic confirmed no significant first-order autocorrelation across the variables. The ANOVA test established significant linear relationships between board composition, board independence, and the expertise of the risk management committee with risk management outcomes, while no significant linear relationship was found for board shareholding. Multicollinearity was minimal, with VIF values ranging from 1.019 to 1.102, indicating that the predictors were not highly correlated. Homoscedasticity was confirmed through histogram and scatterplot analyses, showing consistent variance of residuals. Although normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) indicated significant departures from normality for all variables, the large sample size of 270 observations mitigated this concern, as per the Central Limit Theorem. Despite the non-normality, the fulfillment of other key assumptions linearity, independence of errors, multicollinearity, and homoscedasticity supports the reliability of the regression results, ensuring robust conclusions about the relationships between board governance variables and risk management in the Saudi insurance sector.

The Relationship between Board Composition and Risk Management
The strength of the relationship between board composition and various risk management measures (insurance risk, liquidity risk, credit risk) was investigated using Pearson product moment correlation. The results are shown in Table 8.

Table 8: *Correlation between board Composition and Risk Management*

	Board Composition	Firm Age	firm size	Insurance Risk	Liquidity Risk	Credit Risk
Board Composition	1					
Firm Age	-.165**	1				
firm size	.133*	0.009	1			
Insurance Risk	-.907**	.154*	-0.108	1		
Liquidity Risk	-.937**	.242**	-.150*	.953**	1	
Credit Risk	-.898**	.213**	-0.1	.973**	.969**	1
* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

The table 8 demonstrates that board composition has a strong negative correlation with insurance risk (r = -0.907, p < 0.01), liquidity risk (r = -0.937, p < 0.01), and credit risk (r = -0.898, p < 0.01). This indicates that better board composition is associated with reduced risks in these areas within the insurance industry in KSA. Additionally, there is a weak negative correlation between board composition and firm age (r = -0.165, p < 0.01), suggesting that younger firms may have slightly better board compositions. Firm age shows a positive correlation with insurance risk (r = 0.154, p < 0.05), liquidity risk (r = 0.242, p < 0.01), and credit risk (r = 0.213, p < 0.01), implying that older firms tend to experience higher risks. Firm size has a weak negative correlation with liquidity risk (r = -0.150, p < 0.05), indicating that larger firms might manage liquidity risk slightly better. Finally, the high positive correlations between insurance risk, liquidity risk, and credit risk (all r > 0.95, p < 0.01) suggest that these risks are closely related and tend to increase or decrease together within the industry.

The first objective examined was the effect of board composition on the risk management of insurance companies in KSA. The attributes considered include the control variables (firm age and firm size), the independent variable (board composition) and the dependent variables (insurance risk, credit risk and liquidity risk). The hypothesis tested for this objective proposed that: There is a significant influence of Board Composition on Risk Management in the Insurance Industry in Saudi Arabia. The above hypothesis sought to establish the effect of corporate governance on risk management of insurance companies in KSA. The hypothesis was divided into three sub-hypotheses based on the three dependent variables. The first sub-hypothesis investigated the relationship between board composition and insurance risk, the second sub-hypotheses assessed the relationship between board composition and liquidity risk and lastly the third sub-hypotheses involved regressing board composition against liquidity risk. The three hypothesis based on the objective are presented as follows:

H1a: Board composition significantly influences insurance risk.
H1b: Board composition significantly influences liquidity risk.
H1c: Board composition significantly influences credit risk

The hypotheses were tested using a modified hierarchical regression model as presented in the methodology section. The first model consisted of the control variables while the second model incorporates both the control variables and the independent variable.

$$\text{RMi} = \beta 0 + \beta 1 \text{Firm Age} + \beta 2 \text{Firm Size} + \epsilon \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (4.1)$$
$$\text{RMi} = \beta 0 + \beta 1 \text{Firm Age} + \beta 2 \text{Firm Size} + \beta 3 \text{BComp} + \epsilon \ldots \ldots \ldots \ldots \ldots (4.2)$$

Where; RMi Risk management attribute i (i=1 to 3; i2 =insurance risk, i2=credit risk, i3=liquidity risk); $\beta 0$ is the regression constant or intercept; βi is the regression coefficient of variable I; Bcomp is the board Composition; £I is a random error term that accounts for the unexplained variations. The results are presented in table 9.

Table 9: *Hierarchical regression Results on the Effect of Board Composition on Risk Management (Insurance risk, liquidity risk, credit risk)*

Dependent Variable	Model	R	R Square	Adjusted R Square	Std. Error of Estimate	F Value	Sig. (p-value)	Variable	Unstandardized Coefficient (B)	Standardized Coefficient (Beta)	t-value	Sig. (p-value)
Insurance Risk (H1a)	1	.189a	0.036	0.028	0.014179	4.946	0.008	Constant	0.063	-	10.097	0
	2	.907b	0.824	0.822	0.006078	413.7	0	Firm Age	0.000004	0.004	0.165	0.869
								Firm Size	0	0.013	0.487	0.626
								Board Composition	-0.087	-0.908	-34.457	0
Liquidity Risk (H1b)	1	.286a	0.082	0.075	0.170106	11.87	0	Constant	0.857	-	14.054	0
	2	.942b	0.887	0.886	0.059767	696.399	0	Firm Age	0.001	0.091	4.35	0
								Firm Size	-0.009	-0.028	-1.369	0.172
								Board Composition	-1.083	-0.918	-43.553	0
Credit Risk (H1c)	1	.236a	0.056	0.049	0.094543	7.906	0	Constant	0.461	-	10.657	0
	2	.901b	0.811	0.809	0.042379	380.502	0	Firm Age	0	0.066	2.455	0.015
								Firm Size	0.003	0.017	0.636	0.525
								Board Composition	-0.575	-0.889	-32.601	0

The results presented in table 9 assess the effect of board composition on risk management attributes (insurance risk, credit risk and liquidity risk) in Saudi insurance companies using hierarchical regression. For the first hypothesis (H1a), The first model, including only control variables (firm age and firm size), explained 3.6% of the variance in insurance risk ($R^2 = 0.036$, F = 4.946, p = 0.008). The second model, adding board composition, significantly improved the explanatory power to 82.4% ($R^2 = 0.824$, F = 413.7, p < 0.001). The coefficients showed that board composition had a significant negative impact on insurance risk ($\beta = -0.087$, p < 0.001), while firm age and firm size became non-significant. Thus, the hypothesis H1 is not rejected indicating that board composition significantly reduces insurance risk. Furthermore, the results on the

relationship between board composition and liquidity risk demonstrate that the first model, including only control variables (firm age and firm size), 8.2% of the variance in liquidity risk was explained (R^2 = 0.082, F = 11.87, p < 0.001). The second model, adding board composition, significantly improved the explanatory power to 88.7% (R^2 = 0.887, F = 696.399, p < 0.001). The coefficients revealed that board composition had a significant negative impact on liquidity risk (β = -1.083, p < 0.001), while firm age remained significant (β = 0.001, p < 0.001) and firm size became non-significant. Thus, hypothesis H1b was not rejected indicating board composition significantly reduces liquidity risk. Lastly, the results on the relationship between board composition and risk management which included control variables (firm age and firm size) revealed that 5.6% of the variance in credit risk was explained (R^2 = 0.056, F = 7.906, p < 0.001). The second model, adding board composition, significantly improved the explanatory power to 81.1% (R^2 = 0.811, F = 380.502, p < 0.001). The coefficients indicated that board composition had a significant negative impact on credit risk (β = -0.575, p < 0.001), while firm age remained significant (β = 0.066, p = 0.015) and firm size became non-significant. Thus, the null hypothesis H1c was accepted indicating board composition significantly reduces credit risk in Saudi insurance firms. Overall, the results presented in table 9 demonstrate that the proposed hypothesis proposing that there was a significant influence of Board Composition on Risk Management in the Insurance Industry in Saudi Arabia was not rejected. Specifically, board composition was found to have a significant negative influence on risk management attributes (liquidity risk, insurance risk and credit risk). These results are consistent with the literature which supports the role of independent boards in improving corporate governance and minimizing risks. Al-Faryan (2020) argues that independent boards enhance firm performance by effectively monitoring the management and reducing agency problems. Furthermore, the findings of the study align with those of Adelopo et al., (2021) who stressed the importance of independent boards in ensuring firms adhere to risk management regulations especially during times of uncertainty. Furthermore, Younas et al., (2019) revealed that boards with higher proportion of independent directors are likely to challenge poor performance by the management and also dismiss underperforming CEOs. Similarly, the study revealed that independent members can help minimize opportunistic and self-centered behaviour of managers thereby minimizing risk-taking in firms. Moreover, Akba et al., (2017) supports these findings by demonstrating that greater presence of independent directors is associated with educed corporate risk-taking.

The Relationship between Board Shareholding and Risk Management
The second objective of the study assessed the effect of board shareholding on risk management of insurance firms in KSA. Board shareholding was measured as the ratio of the total shares owned by the board of directors to the total shares provided by the insurance company. On the other hand, the risk management attributes included insurance risk, credit risk and liquidity risk. The indicators were based on data obtained from the published annual financial reports and board reports. The strength of the relationship between Board Shareholding and various risk management measures (insurance risk, liquidity risk, credit risk) was investigated using Pearson product moment correlation. The results are shown in Table 5.9 below:

Table 10: *Correlation between Board Shareholding and Risk Management*

	board shareholding	Firm Age	firm size	Insurance Risk	Liquidity Risk	Credit Risk
board shareholding	1					
Firm Age	0.049	1				
firm size	-.300**	0.009	1			
Insurance Risk	-0.014	.154*	-0.108	1		
Liquidity Risk	-0.012	.242**	-.150*	.953**	1	
Credit Risk	-0.04	.213**	-0.1	.973**	.969**	1
		** Correlation is significant at the 0.01 level (2-tailed).				
		* Correlation is significant at the 0.05 level (2-tailed).				

The correlation matrix for board shareholding shows that it has a weak negative correlation with firm size (r = -0.300, p < 0.01), suggesting that larger firms tend to have lower board shareholding. There are no significant correlations between board shareholding and insurance risk, liquidity risk, or credit risk, indicating that board shareholding does not have a direct relationship with these risk measures in the insurance industry in KSA. Firm age has a positive correlation with insurance risk (r = 0.154, p < 0.05), liquidity risk (r = 0.242, p < 0.01), and credit risk (r = 0.213, p < 0.01). This implies that older insurance firms in KSA experience higher risk levels. Furthermore, hierarchical regression was utilized to assess the second hypothesis of the study which proposed that There was a significant influence of Board Shareholding on Risk Management in the Insurance Industry in Saudi Arabia. The above hypothesis aimed at establishing the effect of board shareholding on risk management on insurance companies in KSA. This hypothesis is tested using three sub-hypotheses including regression of board shareholding against insurance risk, regression of board shareholding against credit risk and regression of board shareholding and liquidity risk. The following is the three sub-hypotheses developed were as presented below:

H1a: board shareholding has a significant influence on insurance risk in Saudi Arabian insurance companies

H1b: board shareholding has a significant influence on liquidity risk in Saudi Arabian insurance companies

H1c: board shareholding has a significant influence on credit risk in Saudi Arabian insurance companies

This sub-hypothesis was tested using a hierarchical multiple regression model as presented below.

$$RMi = \beta0 + \beta1 \text{Firm Age} + \beta2 \text{Firm Size} + \epsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.3)$$

$$RMi = \beta0 + \beta1 \text{Firm Age} + \beta2 \text{Firm Size} + \beta3 \text{Bshare} + \epsilon. \ldots\ldots\ldots\ldots\ldots\ldots (4.4)$$

Where;

RMi Risk management attribute i (i=1 to 3; i1 =insurance risk, i2=credit risk, i3=liquidity risk)

$\beta0$ is the regression constant or intercept

βi is the regression coefficient of variable I

Bshare is board shareholding

The results obtained are presented in table 11.

Table 11: *Hierarchical regression on the effect of Board Shareholding and risk management (Insurance risk, liquidity risk and credit risk)*

Dependent Variable	Model	R	R Square	Adjusted R Square	Std. Error of Estimate	F Value	Sig. (p-value)	Variable	Unstandardized Coefficient (B)	Standardized Coefficient (Beta)	t-value	Sig. (p-value)
Insurance Risk (H2a)	1	.189a	0.036	0.028	0.014179	4.946	0.008	Constant	0.055	-	3.605	0
	2	.197b	0.039	0.028	0.014182	3.596	0.014	Firm Age	0	0.158	2.63	0.009
								Firm Size	-0.003	-0.127	-2.019	0.044
								Board Shareholding	-0.003	-0.06	-0.949	0.344
Liquidity Risk (H2b)	1	.286a	0.082	0.075	0.170106	11.87	0	Constant	0.776	-	4.252	0
	2	.295b	0.087	0.077	0.169936	8.441	0	Firm Age	0.003	0.247	4.217	0
								Firm Size	-0.057	-0.175	-2.84	0.005
								Board Shareholding	-0.049	-0.076	-1.23	0.216
Credit Risk (H2c)	1	.236a	0.056	0.049	0.094543	7.906	0	Constant	0.426	-	4.203	0
	2	.251b	0.063	0.053	0.094354	5.982	0.001	Firm Age	0.002	0.219	3.681	0
								Firm Size	-0.023	-0.129	-2.077	0.039
								Board Shareholding	-0.032	-0.09	-1.439	0.151

The results for the relationship between board shareholding and risk management first revealed that firm age and firm size as predictors accounted for 2.8% of the variance in insurance risk (R^2 = 0.028, F = 4.946, p = 0.008). Introducing board shareholding in the second model marginally increased the adjusted R^2 to 2.8% (R^2 = 0.028, F = 3.596, p = 0.014). However, board shareholding did not exhibit a statistically significant relationship with insurance risk (β = -0.060, p = 0.344), while firm age (β = 0.158, p = 0.009) and firm size (β = -0.127, p = 0.044) showed significant albeit modest associations. Therefore, the hypothesis stating that there is a significant influence of board shareholding on insurance risk in Saudi Arabian insurance companies rejected. Additionally, the results on the influence of board shareholding on liquidity risk demonstrated that firm age and firm size as predictors explained 7.5% of the variance in liquidity risk (R^2 = 0.075, F = 11.87, p < 0.001). Introducing board shareholding in the second model slightly increased the adjusted R^2 to 7.7% (R^2 = 0.077, F = 8.441, p < 0.001). However, board shareholding did not demonstrate a statistically significant relationship with liquidity risk (β = -0.076, p = 0.216), while both firm age (β = 0.247, p < 0.001) and firm size (β = -0.175, p = 0.005) showed significant associations. Therefore, the hypothesis H3b proposing a significant relationship between board shareholding and liquidity risk in Saudi Arabian insurance companies was rejected.Lastly, the results om the relationship between board shareholding and risk management revealed that firm age and firm size were predictors they explained 4.9% of the variance in credit risk (R^2 = 0.049, F = 7.906, p < 0.001). Subsequently, upon the introduction of board shareholding into the model, the adjusted R^2 increased to 5.3% (R^2 = 0.053, F = 5.982, p = 0.001). However, the coefficient for board shareholding was not statistically significant (β = -0.090, p = 0.151), while firm age (β = 0.219, p < 0.001) and firm size (β = -0.129, p = 0.039) demonstrated no significant associations with credit risk. Thus, hypothesis 3C asserting that there was significant influence of board shareholding on credit risk was rejected.

The findings demonstrate that board shareholding did not have a statistically significant impact on risk management in Saudi Arabian insurance companies. These findings diverge from some of the existing literature which often indicate mixed results on the influence of board shareholding on risk management. Some scholars have argued that board shareholding has a significant positive relationship with risk management while others have argued that board shareholding has negative significant impact on risk management practices. There are several reasons that might have caused this discrepancy. First, the unique ownership structure dominant in Saudi Arabia where concentrated ownership by families or block holder is common may have mixed effects on risk management. Block holders may enhance oversight in some cases but may engage in opportunistic behavior that prioritizes personal gain over long term risk mitigation especially during times of crisis (Gao, 2021). Additionally, other studies have found that the influence of board shareholding and risk management may vary depending on the ownership structure and external environment. For instance, studies conducted in China revealed that board shareholding could lead to increased corporate risk and increase inefficiencies like cost stickiness which may lead to poor decision-making and asset allocation (Yan, 2021). Furthermore, the regulatory environment may play an important role in shaping the influence of board governance mechanisms such as board shareholding on risk management (Li et al., 2023).

Conclusion
The study concludes that board composition, particularly the presence of non-executive directors, significantly influences risk management in Saudi Arabian insurance firms, effectively reducing insurance, credit, and liquidity risks. Similarly, board independence plays a critical role in enhancing risk management practices. In contrast, board shareholding does not show a significant impact on risk management outcomes, indicating that ownership stakes alone are not sufficient to drive effective risk management. The study recommends that the CMA enforce guidelines mandating the inclusion of non-executive directors with diverse expertise on insurance company boards to improve risk management, particularly for insurance, credit, and liquidity risks. Additionally, the CMA should strengthen regulations to enhance the independence

of board members, ensuring they have the autonomy to effectively oversee and challenge management decisions. Lastly, the CMA should encourage the establishment of specialized risk management committees within insurance firms, promoting diverse skill sets to strengthen risk oversight and resilience in the sector. Insurance companies in Saudi Arabia are advised to increase the proportion of non-executive directors on their boards to enhance risk management practices, aligning with global governance trends. Furthermore, companies should invest in specialized training for Risk Management Committee members to better address specific risk categories. Establishing specialized committees to focus on distinct risks, such as insurance, liquidity, and credit risk, is also recommended to optimize risk management strategies. These recommendations aim to enhance the governance framework and risk management practices within the Saudi Arabian insurance industry, aligning with the study's findings on the importance of board composition and expertise in mitigating risks.

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