economies

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Do Publicly Listed Insurance Firms in Saudi Arabia Have Strong Corporate Governance?

Mamdouh Abdulaziz Saleh Al-Faryan [1,*] and Jassem Alokla [2]

[1] School of Accounting, Economics and Finance, Faculty of Business and Law, University of Portsmouth, Richmond Building, Portland Street, Portsmouth PO1 3DE, UK
[2] Department of Accounting and Finance, Sussex Business School, University of Sussex, Brighton BN1 9SN, UK
* Correspondence: al-faryan@hotmail.com

Abstract: Saudi Arabia has now opened its markets to foreign investors in line with its strategy to diversify its economy. However, investors need to feel confident that Saudi enterprises are being monitored and regulated appropriately. This study identifies the impact of improvements in Saudi corporate governance practices among insurance firms. The effects of corporate governance on the financial performance of 35 insurance firms listed on the Saudi stock market are examined from 2008 to 2014, including Shariah-compliant and life insurance firms. Four different methodologies are used: the generalised least squares random effect, fixed effect models, a difference-in-differences (DID) measurement for comparisons, and the probit model with average marginal effect to address endogeneity. The results indicate that firm performance is affected by information asymmetry. The 2009 exogenous shock from the Saudi regulatory change to board composition and audit committee size shows a positive effect on performance in the DID comparison. However, an increase in independent board and audit committee members has a significant negative effect. Other findings indicate that an increase in CEO (Chief Executive Officer) age has a positive effect on performance, as do three pay variables (director incentives, CEO and top executive pay, and above-the-mean director incentives). However, when CEO and top executive pay increases above the mean, the effect turns negative; this also happens with a change in CEO from poor performance. The results support the importance of Saudi insurance industry corporate governance regulation and reflect the improved governance perspectives of the Saudi Capital Market Authority and Saudi Arabian Monetary Agency.

Keywords: corporate governance; Saudi Arabia insurance firms; board composition; audit committee size; managerial pay; shariah compliant; life insurance firms

JEL Classification: G22; G30; G34; G38; J33; K22; L25

Citation: Al-Faryan, Mamdouh Abdulaziz Saleh, and Jassem Alokla. 2023. Do Publicly Listed Insurance Firms in Saudi Arabia Have Strong Corporate Governance? *Economies* 11: 21. https://doi.org/10.3390/economies11010021

Academic Editor: George R.G. Clarke

Received: 14 October 2022
Revised: 1 November 2022
Accepted: 14 November 2022
Published: 10 January 2023

1. Introduction

In the Kingdom of Saudi Arabia (KSA), issues related to corporate governance have become central in its business environment (Al-Faryan 2020; Bagais and Aljaaidi 2020). Foreign investors can now expand their portfolios by investing in the KSA, as it has now opened its markets and its economy in line with achieving its Vision 2030, a strategy of diversification (Yousaf and Alokla 2022). These recent developments in the country and the role that corporate governance plays in creating confidence in Saudi firms have placed increased emphasis on the importance of effective firm governance (Almaqtari et al. 2020; Hashed and Almaqtari 2021). However, the issue of corporate governance has long been ignored in developing countries, such as the Gulf Cooperation Council economies. This is particularly true in one of the most important sectors in the KSA economy, the insurance industry (Alokla et al. 2022), even though such governance has long been seen as a major factor influencing the industry's financial performance. To assess this, we investigate governance in the emerging market of the KSA, looking specifically at the insurance industry.

Effective governance is generally measured by firm performance; however, although the link between corporate governance and firm financial performance has been widely studied in many fields, the academic debate on this continues. The main reason for this is that the relationship between firm financial performance and corporate governance is complex, as many studies have shown (Dalton and Dalton 2011; Fogel and Geier 2007; Hermalin and Weisbach 1991; McGuire et al. 2012). Scholars continue to debate what the optimal size should be for an audit committee, whether there is a link between future returns and stock dividends, and how significant the impact of a high capitalisation ratio is on return on equity. The evidence in extant studies has been contradictory, especially regarding optimal board size, compensation, and the number of outside directors. Although Klein (1998) and Bhagat and Black (2001) appear to report conclusive findings, their studies do not control for risk retention, CEO tenure, and firm age simultaneously. To provide a new perspective unlike that in previous studies (Gugong et al. 2014; Alokla et al. 2022), we add to our models volatility, risk retention, firm size, and firm age. We also consider Shariah compliance, which references the following of Islamic Law or Shariah. From our study perspective, our interest is in whether the performance of Shariah-compliant insurance firms reflects a similar effect in terms of corporate governance as the rest of the industry.

As there is no standardised financial measurement of performance, we choose the following variables to measure firm financial performance: return on equity (ROE), return on assets (ROA), and Tobin's Q. We explore insurance firm corporate governance in terms of board composition, audit committee size, CEO age, CEO turnover, director incentives, and CEO and top executive pay and their impact on insurance firm performance in the KSA. Additionally, as governance is an under-researched issue in this country owing to the lack of data, our study fills a gap in the literature.

In the application of the corporate governance code in the KSA, insurance firms differ from other companies, as they are monitored by two official bodies, the Capital Market Authority (CMA) and the Saudi Central Bank or Saudi Arabian Monetary Agency (SAMA). To measure the impact of governance on insurance firm performance in the country, we examine several issues specific to board composition and audit committee size, in particular, the effect of the 2009 financial regulatory reform regarding board composition and audit committee size for publicly listed insurance firms in the KSA.

We also address a gap in the literature by considering the endogenous character of board composition, audit committee size, CEO age, CEO turnover, director incentives, and CEO and top executive pay in Saudi insurance companies. Our research questions regarding the relationship between governance and firm performance are as follows.

- Do board composition, audit committee size, CEO age, CEO turnover, director incentives (above the mean), and CEO and top executive pay (above the mean) have a positive relationship with firm performance?
- Has the 2009 exogenous shock created by regulatory changes to Saudi boards and audit committees had a positive effect on insurance performance?
- Does increasing information asymmetry in KSA insurance firms negatively affect financial performance?
- What are the optimal sizes of independent boards and audit committees that have a positive effect on performance?
- Do CEO turnover, above the mean director incentives, and CEO and top executive pay above the mean negatively affect insurance firm performance?
- Do listed Shariah-compliant insurance firms and life insurance firms follow the same patterns as all listed insurance firms in terms of the effects of board independence and audit committee size on firm performance?

Our empirical findings offer five significant contributions to the corporate governance literature. First, to the best of our knowledge, ours is the first study to use Saudi insurance data to examine the endogenous impact of board composition, audit committee size, CEO age, CEO turnover, director incentives, and CEO and top executive pay on insurance firm performance. We do this by investigating 35 Saudi insurance firms between 2008 and

2014, applying four empirical approaches; the generalised least squares (GLS), the random effect (RE) and fixed effect (FE) models, a difference-in-differences (DID) comparison, and the probit model with average marginal effect. Second, we examine the effectiveness of directors when they are challenged by high commission costs or faced with asymmetric information. In addition, we look at the effect of the critical mass of board independence and auditing committee size on firm performance. Third, we investigate the impact of the 2009 regulatory reform of board composition and audit committee size on listed Saudi insurance firms. Fourth, we investigate the effects of board composition and audit committee size (Islamic corporate governance) on the performance of Saudi Shariah-compliant firms and life insurance. Finally, we extend the study of Al-Faryan and Dockery (2021) and find that, overall, the insurance sector has lagged behind in complying with new governance legislation. Namely, not all firms have adhered to various procedures requiring listed companies to improve transparency in corporate financial reporting in the macro insurance sector or in terms of macroeconomics. Our study focuses, in particular, on the link between corporate governance and Saudi insurance firm performance from the perspective of microeconomics. Our results provide useful implications for supervisors, managers, and practitioners regarding the controversial relationship between corporate governance and financial performance, specifically in an emerging market.

The rest of the paper is structured as follows. Section 2 presents the literature review and our research hypotheses. Section 3 introduces our data and variables. Section 4 discusses our methodology. Section 5 provides the results and a discussion of the findings, and Section 6 concludes with research and managerial implications.

2. Literature Review and Hypotheses

Many studies in different sectors have examined the relationship between corporate governance and firm financial performance (Al-Faryan 2017; Al-Faryan and Dockery 2017; Conyon and Florou 2002; Ghabayen 2012; Gibson 2003; Jenter and Kanaan 2015; Li et al. 2015; Liu et al. 2015; Volpin 2002).

The literature on the Saudi market has highlighted several findings. Al-Faryan (2017), Al-Faryan and Dockery (2017), and Ghabayen (2012) have found mixed results. While Ghabayen (2012) results reveal that audit committee size, audit committee composition, and board size have no effect on firm performance in the 102 non-financial firms, the same results were also found by Al-Faryan (2017), who also found two variables to have a significant negative relation: CEO turnover and independent board members with firms' performance. Al-Faryan and Dockery (2017) found that regulation and instability affect the ownership structure of 169 firms listed from 2008 to 2014. Moreover, evidence from a number of experimental studies has established that there is an inverse and robust statical relationship between corporate governance and a firm's performance. On a sample of 460 largest UK listed firms from the period 1990–1998, other studies used a sample of 3365 CEO turnovers from 1993 to 2009 and over 1200 firms in eight emerging markets. Conyon and Florou (2002), Jenter and Kanaan (2015), and Gibson (2003), respectively, have found that top executives are fired due to their poor performance. On the other hand, both Li et al. (2015) and Liu et al. (2015) have found a positive relationship between declining ownership concentration and board independence on firms' performance in China. While Volpin (2002) examined the determinants of executive turnover and firm valuation as a function of ownership and control structure in Italy, and his finding suggests that there is poor governance, as measured by a low sensitivity of turnover to performance.

Although few studies have been conducted on the insurance industry in developed economies, extant studies, such as Elamer et al. (2018) in the UK and Eckles et al. (2011) in the US, have examined the relationship between corporate governance and firm performance. However, there are several studies on the insurance industry in developing economies; for example, in Nigeria (Ajemunigbohun et al. 2020; Akeem et al. 2014; Azutoru et al. 2017; Fadun 2013; Fodio et al. 2013; Gugong et al. 2014), Ethiopia (Fekadu 2015; Yemane et al. 2015), Kenya (Wanyama and Olweny 2013), Ghana (Tornyeva and Wereko

2012), Nepal (Maharjan 2019), Palestine (Shaheen and Jaradat 2019), India (Chaudhary 2014), Taiwan (Huang et al. 2007), Sri Lanka (Panditharathna 2016), Bangladesh (Datta 2018), Pakistan (Arif 2019), and Bahrain (Najjar 2012).

In general, these studies in developing economies are plagued by one of the following issues: (1) Few observations, a short timeframe, and a lack of application of professional software analysis, for example, SPSS; these issues lead to data bias or multicollinearity and omitted variables during regression analysis, which can weaken confidence in the results. (2) Negligence in some assumption tests that would improve robustness, for example, endogeneity, exogenous, and simultaneity problems. (3) Overlooked control variables related to insurance companies that impact corporate governance, as some studies have combined independent variables without adding control variables into the regression models. (4) Overlooked determinants of corporate governance for insurance firm performance (i.e., CEO age, CEO turnover, director incentives, CEO and top executive pay, changes in corporate governance regulations, and the optimal independent board and audit committee size). Our study addresses all of these issues.

However, by highlighting different factors, these studies do confirm that insurance company success is linked to corporate governance practices. Thus, an important question remains: which corporate governance (independent) factor (one of the many decisions a company makes) impacts insurance firm performance the most (the dependent variable)?

2.1. Board Composition and Board Independenc

Many authors have confirmed that board structure is a fundamental part of agency theory (Bhagat and Bolton 2008; Dalton and Dalton 2011). In a study on Kenya, Wanyama and Olweny (2013) found a positive association between board composition and CEO duality and financial performance. In contrast, in Pakistan, Arif (2019) found that CEO duality is negatively associated with insurance firm performance. The study by Najjar (2012) on insurance companies listed on the Bahrain Stock Exchange between 2005 and 2010 found that board size, firm size, and the number of block holders had a positive significant effect on financial performance. In China, Liu et al. (2015) found that board independence positively affects firm performance, especially in government-controlled firms; the impact of board independence on firm performance increases with ownership concentration. In contrast, in a study on non-financial firms in the Saudi market, Ghabayen (2012) found that board composition had a significant negative relationship with firm performance. Similarly, in Nepal, looking at 2011 to 2018, Maharjan (2019) found that board size and CEO duality were negatively associated with financial performance. Meanwhile, Shaheen and Jaradat (2019) found that, in Palestine, firms that hold more frequent board meetings and have CEO duality achieved better performance.

In the case of the KSA market, among listed firms, Al-Faryan (2021) found no significant association between board composition and firm performance, after examining 169 firms from 2007 to 2014 using RE and FE models. However, his findings indicate that the effects of the regulatory reform in 2009 on board independence are endogenous and positive with a firm's stock return performance and Tobin's Q. The implication is that the firms investigated are complying with the country's corporate governance regulation. In addition, with three to four independent board members, the effectiveness of board independence strongly relates to firm performance (ROE and stock returns).

Examining 11 Saudi banks between 2009 and 2012, Al-Sahafi et al. (2015) reported that board independence has a significantly positive relationship with performance. In contrast, looking at the period 2014 to 2017, Almoneef and Samontaray (2019) show that board independence has a negative effect on Saudi bank performance. Prior to this, Alhassan et al. (2015) used ordinary least squares regression to assess the performance of 10 publicly traded Saudi banks between 2007 and 2012. They looked at the number of meetings, board composition, and board size as determinants of corporate governance. The authors found a non-significant relationship between board size and board composition with firm

performance, while board meetings have a significant positive relationship. The timeframe allows them to analyse the impact of the corporate governance code of 2006.

However, the above studies overlook insurance firms in the financial sector, even though, as part of that sector, along with banks, such firms are monitored by SAMA and CMA in the KSA (Al-Faryan 2020). Specifically, these studies overlook the 2009 exogenous shock from regulatory changes to board composition, along with endogeneity issues.

Looking at the period 2006 to 2010, Fadun (2013) examined 10 insurance firms listed on the Nigerian stock exchange and found that board size positively relates to financial performance. However, for the period 2011 to 2015, Azutoru et al. (2017) argue that board size had a negative association with financial performance. Moreover, Akeem et al. (2014) found no evidence to support the idea that board size or other board composition aspects relate to financial performance. In Ethiopia, Yemane et al. (2015) conducted a study on 10 insurance firms from 2009 to 2013. They concluded that board meetings and board compensation have a statistically significant positive impact on financial performance. However, they found no evidence of the impact of board size. Meanwhile, Fekadu (2015) and Panditharathna (2016) found no evidence of a relationship between corporate governance and firm performance in 56 listed financial firms on the Colombo Stock Exchange in Sri Lanka. Datta (2018) reported a negative relationship between board composition and financial performance in 10 listed insurance companies in Bangladesh.

Coles et al. (2008) point out that complex firms, which need more advice than simple ones, have larger boards of directors, with a higher proportion of outside directors. Tobin's Q and board size have a U-shaped relationship, which implies that either very small or extremely large boards are optimal. However, this relationship occurs as a result of distinctions between complex and simple firms. For complex (simple) firms, Tobin's Q increases (decreases) board size, with this relationship driven by the presence of outside directors.

However, other studies have revealed that independent boards do not always enhance value. For example, according to Adams (2012), financial firms in acute trouble during the 2008/2009 financial crisis that required government bailout funding had more independent boards than those that were not in trouble. The author speculates that this was due to the lack of expertise and industry understanding among the majority of the independent directors. According to Yermack (1996) and Eisenberg et al. (1998), board size has a negative impact on firm performance. Namely, larger boards equate to higher monitoring costs, limiting their capacity to effectively monitor and manage.

Based on these mixed results, we test the following hypotheses.

Hypothesis 1. *Board composition/independence is positively associated with financial performance of listed Saudi insurance firms.*

Hypothesis 2. *The exogenous shock from the regulatory changes to Saudi boards are negatively related to the performance of listed Saudi insurance firms.*

2.2. Monitoring Costs

According to the literature, when monitoring expenses rise, the advantages of having more board independence diminishes (Al-Faryan 2021; Fama and Jensen 1983; Linck et al. 2008). Al-Faryan (2021) contends that external directors incur more costs in comparison with internal ones; the underlying reason for this being the diminished capacity of independent board members to oversee and advise management effectively. There are two major drawbacks to external directors. First, in regard to all firm aspects affected by information asymmetry, internal directors will have more and better information compared with what external directors have access to. Second, external directors may lack sufficient expertise, given that internal managers (directors) have gained company-specific expertise, while external directors are likely to have more general knowledge. As a result, external directors add more costs in terms of the need to gather information on the company and greater expertise in performing their duties effectively (Al-Faryan 2021). Al-Faryan (2021) and

Maug (1997) indicate that, in an environment of high information asymmetry, increasing the number of independent directors lacks beneficial effects and will have a negative effect on performance. Similarly, other studies have shown that an increase in monitoring costs leads to a decrease in the number of external directors (Adams and Ferreira 2007; Raheja 2005). Linck et al. (2008), Duchin et al. (2010), and Al-Faryan (2021) show that, when the cost of acquiring information is lower, independent directors become more valuable. In addition, among Saudi and Chinese firms, board composition seems to have a stronger effect on firm performance (Al-Faryan 2021; Liu et al. 2015). Based on this, we posit the following hypothesis.

Hypothesis 3. *Information asymmetry (monitoring costs) in Saudi insurance firms will negatively affect firm performance.*

2.3. Audit Committee Size

Audit committee size is a recognised aspect of the effectiveness of corporate governance and, as such, is expected to play a key role in the financial performance of insurance firms. The audit committee's role is to enhance firm value. Maharjan (2019), Fadun (2013), and Fekadu (2015) all found a positive relationship between audit committee size and financial performance. In contrast, Datta (2018), Ghabayen (2012), Yemane et al. (2015), and Al-Faryan (2017) found that audit committee size does not affect firm performance. As audit committees have become a fundamental part of a firm's strategy for generating profits and maximizing shareholder value, according to Braiotta et al. (2010) and Karamanou and Vafeas (2005), large audit committees have been shown to provide superior organisational capacity and authority, as well as a vast knowledge base. However, Karamanou and Vafeas suggest that, when audit committees become too big, they risk becoming ineffective, losing track of procedures and duties, and, eventually, failing to fulfil the duties assigned to them swiftly and properly. Aldamen et al. (2012) discovered a favourable correlation between smaller audit committees with higher expertise and firm performance. However, these extant studies have not examined an exogenous regulatory shock on audit committee size. Thus, we posit the following hypotheses.

Hypothesis 4. *A larger audit committee is positively related to firm performance of listed Saudi insurance firms.*

Hypothesis 5. *The exogenous shock of the regulatory change to Saudi audit committees have a significant positive effect on the performance of listed Saudi insurance firms.*

2.4. CEO Characteristics

2.4.1. CEO Age

The influence of a CEO's age on firm performance has garnered considerable attention in the literature. The presumption is that older CEOs will have a competitive edge over younger ones, who unquestionably have less experience managing a business (Peni 2014). According to Yeoh and Hooy (2022), CEO age has a negative association with firm performance, as risk-taking rises with age; however, beyond a particular age threshold, risk-taking decreases. In contrast, Davis (1979) found no relationship between firm success and CEO age, whereas Amran et al. (2014) reported a negative association between firm performance and CEO age, particularly in terms of ROA. As a result, we posit the following hypothesis.

Hypothesis 6. *Age of CEO is positively related to firm performance in listed Saudi insurance firms.*

2.4.2. CEO Turnover

When emerging-market enterprises do poorly, their CEOs are likely to lose their positions (Gibson 2003). Conyon and Florou (2002) show a statistically significant negative relationship between the likelihood of management turnover and firm performance, with top executives dismissed for bad performance. However, reviewing a hand-collected sample of 3365 CEO turnovers from 1993 to 2009, Jenter and Kanaan (2015) demonstrate that CEOs are more likely to be fired after poor industry performance and, to a lesser degree, stock market performance. They indicate that a drop in industry performance from the 90th to the 10th percentile more than doubles the likelihood of a forced CEO change. Al-Faryan (2017) discovered a negative correlation between CEO turnover and performance in all Saudi publicly traded companies. Friedman and Singh (1989) determined that, while company performance is a significant factor affecting CEO turnover, there are additional factors that have been overlooked, such as the CEO's proximity to retirement age, whether the CEO's departure was voluntary, and whether a new CEO was found. Thus, we posit the following hypothesis.

Hypothesis 7. *Firm performance is negatively related to CEO turnover in Saudi insurance firms.*

2.5. Managerial Pay

2.5.1. Director Incentives

A key role of corporate boards is to ensure that managers undertake their tasks in the best interest of shareholders. Nevertheless, in some cases there is collusion among management. This, therefore, leads to agency problems between shareholders and directors (Fama and Jensen 1983). Compensation policy is considered a key component in a firm's success (Jensen and Murphy 2010) and a means of addressing board oversight. Murphy (1985) criticises earlier research that focuses only on the visible parts of wages, such as pay and bonuses, while ignoring the most sensitive indicators of firm success, such as stock options and awards. Furthermore, the author contends that, while it is fair to suppose that stock price influences management remuneration, this is not the main predictor of such remuneration. Mehran (1995) studies the relationship between executive pay structure and performance and finds support for incentive pay, claiming that the kind rather than the size of the remuneration encourages managers to improve performance. Contrary to theoretical predictions, in Nigeria, Azutoru et al. (2017) found that executive director incentives do not influence the financial performance of insurance firms. However, according to Al-Faryan (2021), director incentives have a positive relationship with Tobin's Q in Saudi listed enterprises. Thus, we posit the following hypothesis.

Hypothesis 8. *Director incentives are positively related to firm performance.*

2.5.2. CEO and Top Executive Pay

According to Garen (1994), several prior studies have found a positive and significant association between CEO and top executive compensation and financial performance. Top managers who receive greater incentives and stock awards are more likely to make conservative choices that reduce a firm's profitability (Eckles et al. 2011). In Nigeria, Olaniyi and Olayeni (2020) found a two-way relationship between firm success and CEO salary. They indicate that CEO compensation affects firm performance positively, while firm performance affects CEO compensation adversely. Furthermore, they believe that CEOs should be rewarded for strong performance but not penalised for poor performance; this would mean that CEOs would be well paid even when their firms do poorly. In a study on publicly traded firms in China between 2009 and 2015, Bin et al. (2020) found that there is a positive relationship between firm performance and CEO pay. Al-Faryan (2021) indicates that CEO pay and top executive compensation have a positive association with the performance of Saudi listed enterprises, as well as government listed enterprises, assuming

that the enterprises are competitive and not just controlled by the Saudi government. Thus, we posit the following hypothesis.

Hypothesis 9. *CEO and top executive pay are positively related to firm performance.*

Based on the extant research discussed above, our study extends the current literature in the context of listed insurance firms in the following ways. First, we contribute to the literature on audit committee size, CEO top executive pay, CEO age, CEO turnover, board composition, and director incentives by examining data from publicly listed Saudi insurance firms between 2008 and 2014. We believe ours is the first study to review these elements of corporate governance in the context of the Saudi market and Middle East and North Africa economies. Second, we examine the effectiveness of independent directors when they are faced with either high monitoring costs or information asymmetry. Third, we look at the effect of the critical mass of board independence and audit committee size on insurance firm performance. We also evaluate the exogenous impact of changes in board and auditing committee regulation, given that exogenous impacts tend to be rare occurrences in the context of insurance firms. Fourth, we look at Shariah-compliant and life insurance firms in terms of the effects of board composition and audit committee size on firm performance. Finally, we extend the literature that utilises cross-sectional regressions by employing panel data to account for endogeneity and exogenous issues, often ignored in developing economies.

3. Data and Variables

To assess whether the listed insurance firms in the KSA have strong corporate governance, we employ a unique panel dataset consisting of 35 listed Saudi insurance firms in the period 2008 to 2014, including 16 firms that offer life insurance products and seven Shariah-compliant firms that offer insurance products. Data are obtained from the CMA and Mubasher. We begin the study in 2008, since prior to that there are missing observations and variables among the data for Saudi insurance firms.

Murphy (1985) argues that cross-section models are inherently flawed due to a lack of theoretical basis for relevant variables and the possibility of omitted variables. Notably, if we assume that the omitted variables will not change over time, we can accurately assess the relationship through time-series regressions. For this reason, we use panel data regressions, employing four different methods: the GLS (Generalised Least Squares), RE (Random Effect), and FE (Fixed Effect) models; a DID (Difference-In-Differences) comparison; and the probit average marginal effect model to account for endogeneity issues (Al-Faryan 2021).

There are unique elements in our dataset period. First, the number of firms increased during this timeframe; with 21 listed insurance firms in 2008 and 35 by the end of 2014. Notably, in 2004, there is just one listed insurance firm in Saudi Arabia. Obviously, as the industry expands, the implementation of strong corporate governance grows in importance in this sector. Second, our dataset can be compared with that used by Al-Faryan and Dockery (2021), which addresses the governance code in the Saudi macro insurance sector (in terms of macroeconomics), and covers a similar period. However, herein, we focus on the link between corporate governance and Saudi insurance firm performance from the perspective of microeconomics. Third, during this period, most insurance companies lost more than 20% of their capital, and there was little profitability (Alokla et al. 2022). Thus, despite the recent establishment of these companies, we need to examine their governance during this period. Fourth, the absence of an insurance policy is linked directly to the National Information Center. To avoid discovery, individuals can manipulate their insurance or fail to comply with it. Additionally, there is no fine for individuals who do not follow their insurance policies. Fifth, as many companies had to suspend trading in their stock due to losses during this timeframe, there is a lack of information on many variables

after 2014. For this reason, our sample only goes to 2014, as there would be additional time and effort required, as well as financial restrictions, in compiling data after 2014.

3.1. Dependent Variables

We utilise three financial performance variables, ROA, ROE, and Tobin's Q, to examine whether the findings are sensitive to particular measurements and to ensure consistency. Notably, ROA and ROE are accounting-based and backward-looking performance indicators (Al-Faryan 2021; Shan and McIver 2011), whereas Tobin's Q is a forward-looking, market-based measurement that quantifies the value investors place on future company prospects (Al-Faryan 2021). Tobin's Q is often troublesome in corporate governance research as it is conceived as an indicator for future development potential, describing value as a cause rather than a result of the corporate governance framework (Al-Faryan 2021; Boone et al. 2007; Lehn et al. 2009; Linck et al. 2008). However, Morck et al. (1988) suggest that Tobin's Q can represent the non-current assets of a firm better than operational performance can, as operational performance may not convey market expectations arising from reforms, especially when corporate governance structures and rules change. Thus, because of this, Tobin's Q is included to assist in our analysis and for robustness and comparison with performance indicators specified in the corporate governance literature.

3.2. Independent Variables

Our independent variables are board composition, director incentives, independence, board-monitoring costs, audit committee size, regulation (as assessed by DID), CEO and top executive pay, CEO age, and CEO turnover.

Saudi board directors are defined as executive directors who work fulltime for the company and are paid a salary; non-executive directors are those who do not work fulltime for the company and do not receive fulltime salaries; independent directors are those who do not work fulltime for the company and do not receive fulltime salaries. Independent directors are entirely impartial to the firm. Non-independent directors meet one of the following criteria: the director holds 5% or more of the company or its subsidiary shares or legally represents another firm or person who owns 5% or more of the company or its subsidiary shares, the director has been a top executive in the firm or one of its subsidiaries in the previous two years or works for another corporation affiliated with the firm, the director has been nominated to a board associated with the holding company's board of directors, or its management is linked to other board members. According to the 2009 legislation, most directors must be non-executive directors, and the total number of independent directors should be equal to two or to one-third of the total directors, whichever is larger (Al-Faryan 2021; Capital Market Authority CMA 2017).

According to the 2009 Saudi legislation, the audit committee must be created by a resolution of the firm's ordinary general assembly; its members must be shareholders or others, providing that at least one is an independent director and one is a non-executive director. The audit committee cannot have less than three members or more than five; at least one should be a financial and accounting specialist (CMA 2017).

3.3. Control Variables

Control variables are identified as the variables that impact and consequently correlate with firm performance. The selection of control variables is critical for the consistent estimation of the analysis. Our choice of control variables follows existing research, and thus, our analyses include control variables adapted from the literature. We believe the addition of control variables improves our estimates while reducing the omitted variable bias reported in earlier research. Further detail on this topic can be found in MacAvoy et al. (1983), Baysinger and Butler (1985), McConnell and Servaes (1990), and Al-Faryan (2021). Our control variables are CEO share %, *CEO tenure*, *Ln(Assets)*, *Ln(gross written)*, *Ln(firm age)*, volatility, risk retention %, and depth of the insurance market.

We utilise natural logarithms for three reasons: to simplify the interpretation of the results, to simplify the calculation of the results, and to lower the amount of skew in the size distribution of the enterprises, as per Murphy (1985); Demsetz and Lehn (1985) also observed that such data may be transformed from bounded to unbounded. The control variables are explained as follows.

3.3.1. Assets

We define the size of the firm as the logarithm of total assets, which is widely employed as a control variable in empirical investigations, including those by Mwangi and Murigu (2015), Alokla et al. (2022), Shaaban and Wahome (2018), Ismail (2013), Eling and Marek (2014), Bubic and Susak (2015), and John et al. (2008). Larger firms require more outside knowledge and benefit further from better monitoring and review; we measure the natural logarithm of assets, as this can address the fact that larger firms are more likely to have more external directors on their boards (Al-Faryan 2021). Firms with higher asset value also enjoy economies of scale and a more diversified insurance portfolio (Alokla et al. 2022). Moreover, firms with higher asset value receive more media attention compared with smaller firms, which may impact investors.

3.3.2. Risk, Volatility, and Market Depth

Reinsurance is an important aspect of the insurance industry and plays a critical role in the global industry's financial stability (International Association of Insurance Supervisors 2012; Alokla et al. 2022). Insurance companies have different financial strengths, which affect their reinsurance arrangements and dictate how much risk they retain. Eling and Marek (2014) include volatility in their model and find that the theoretical volatility of asset returns is lower for non-life insurance firms. We use variables of risk retention, volatility, and market depth since firms differ in terms of market share and growth in market share, which may have a positive impact on financial performance (Alokla et al. 2022; Kozak 2011).

3.3.3. CEO Tenure and Share

CEO tenure and CEO share have been used widely in empirical studies as control variables. However, Gibbons and Murphy (1992) provide evidence that CEOs are likely to have different incentives, reputations, and career concerns, depending on their age and their years of tenure. Thus, a CEO who has five years of tenure at age 65 is more likely to have different management qualities than others. These CEOs are likely to have different incentives, reputations, and career concerns (Dikolli et al. 2014).

3.3.4. Firm Age

Financial performance and firm age have also appeared in the empirical literature as control variables in studies by Guruswamy and Marew (2017), Charumathi (2012), and Shiu (2004). However, Mwangi and Murigu (2015) found no evidence of the effect of firm age on firm performance.

3.3.5. Gross Written Premiums

Economic theory suggests that insurance firms with strong and sustainable business growth are more likely to be financially stable and profitable. Although several studies have widely used gross underwriting premiums as a control variable, the results regarding its relationship with financial performance have been mixed (e.g., Mardi et al. 2017; Mazviona et al. 2017; Alokla et al. 2022; Shaaban and Wahome 2018; Zhang and Nielson 2015).

We choose not to use the CEO duality variable, as all Saudi insurance firms follow the corporate governance code (regulation) that does not allow the CEO to be chairperson. In addition, we chose not to use ownership variables. Although many Saudi insurance firms have owners with less than a 5% share, data for these owners are not available since

corporate governance regulation only requires the disclosure of ownership of 5% or more (Al-Faryan 2021; CMA 2017).

In addition, we are unable to apply the governance index of 24 rules proposed by Gompers et al. (2003) to proxy the level of shareholder rights to measure corporate governance quality, as the firms listed in the Saudi stock market lack those governance provisions (Al-Faryan 2022). Moreover, we do not differentiate between forced and voluntary CEO turnover (Al-Faryan 2022; Denis et al. 1997), as our source material is each firm's annual report, wherein forced turnover is not distinguished from voluntary turnover.

4. Methodology

We use STATA software (StataCorp LLC, Lakeway Drive College Station, TX, USA) to apply four empirical methods to examine whether the listed Saudi insurance firms have strong corporate governance during our timeframe. As mentioned, we use the RE, FE, and DID models and the probit model with average marginal effect. The RE technique differs from the FE effect technique in that the variation in the error term is believed to be unrelated to the independent variables. Statistically, the FE models are more independent of the observed factors and forecasts. The RE approach takes advantage of partial pooling, while the FE technique does not (Al-Faryan 2021). The Hausman (1978) test can be used to identify which model to use, for example, when there are fewer data points for partial pooling, and the coefficient estimates are influenced by more plentiful data from other groups. In this case, the RE approach may be preferable to putting all the groups together (which may disguise group-wide variation) or calculating effects individually for all groups (which may result in low-sample estimates) (Al-Faryan 2021). The RE technique generalises the fractional pooling method as a statistical model, enabling its application in a variety of scenarios. Our RE and FE models are expressed as follows.

$$PERF_{it} = \alpha + \beta_1 \%IB_{it} + \beta_2\, Ln\,(BS)_{it} + \beta_3 Ln\,(Assets)_{\,it} + \beta_4 Ln\left(Firm^{Age}\right)_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\,(gross\ written)_{it} + \varepsilon_{it}, \quad (1)$$

where $PERF_{it}$, the dependent variable, is either ROA, ROE, or Tobin's Q. ROA is the firm's annual net profits over total assets; ROE is the firm's annual net profit over total equity; Tobin's Q is the firm's total market capital over total assets. *%IB* is the board composition as a percentage of the independent directors on the board in a certain year (the number of independent directors divided by the total number of directors). *Ln(BS)* is the natural logarithm of the board size (natural logarithm of the number of directors on the board in a certain year); notably, *Ln(BS)* may be negative since the increase in agency cost caused by having a high number of directors may impair efficiency and lower firm performance (Al-Faryan 2021; Jensen 1993; Lipton and Lorsch 1992; Yermack 1996); *Ln(Assets)* is the natural logarithm of total firm assets; $Ln\left(Firm^{Age}\right)$ is the natural logarithm of firm age since incorporation. *VOL* is volatility (annualised standard deviation of monthly stock returns). *RiskRet* is a percentage of risk retention (net premiums written over gross premiums) Alokla et al. (2022). *DeInMarket* is the depth of the insurance market or insurance penetration (insurance penetration of total gross domestic product (GDP) is defined as gross written premiums divided by total GDP). *Ln(gross written)* is the natural logarithm of gross premiums written measured by the sum of both direct premiums written and assumed premiums written, before deducting the reinsurance ceded.

For the robustness of the results, we use the following equation.

$$PERF_{it} = \alpha + \beta_1 IB\,(3)_{it} + \beta_2 IB\,(4)_{it} + \beta_3 IB\,(5)_{it} + \beta_4 IB\,(6)_{it} + \beta_5\, Ln\,(BS)_{it} + \beta_6 Ln\,(Assets)_{\,it} + \beta_7 Ln\left(Firm^{Age}\right)_{it} + \beta_8 VOL_{it} + \beta_9 RiskRet_{it} + \beta_{10} DeInMarket_{it} + \beta_{11} Ln\,(gross\ written)_{it} + \varepsilon_{it}, \quad (2)$$

where *IB*(3), *IB*(4), *IB*(5), and *IB*(6) are the number of independent members on the board, grouped as three, four, five, and six or more, respectively (dummy variable equals 1 if the firm has up to six or more independent directors, and 0 otherwise).

For additional robustness, we examine if monitoring costs affect insurance firm performance as follows.

$$PERF_{it} = \alpha + \beta_1 \%IB_{it} + \beta_2 \%IB * VOL_{\ it} + +\beta_3\ Ln\ (BS)_{it} + \beta_4 Ln\ (Assets)_{it} + \beta_5 Ln\ (Firm^{Age})_{it} + \beta_6 VOL_{it} + \beta_7 RiskRet_{it} + \beta_8 DeInMarket_{it} + \beta_9 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (3)$$

where *%IB*VOL* is the monitoring cost (the interaction term proxies for information asymmetry or the monitoring cost of independent directors, namely, board composition multiplied by the annual standard deviation of monthly stock returns, following Fama and Jensen (1983), Linck et al. (2008), and Al-Faryan (2021)).

To examine the different variables along with audit committee size, we use the following equation.

$$PERF_{it} = \alpha + \beta_1 SAC_{it} + \beta_2 Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{\ it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (4)$$

where *SAC* is the size of the audit committee (number of audit committee members).

To check for robustness, we use the following equation.

$$PERF_{it} = \alpha + \beta_1 Asize\ (3)_{it} + \beta_2 Asize\ (4)_{it} + \beta_3 Asize\ (5)_{it} + \beta_4 Ln\ (BS)_{it} + \beta_5 Ln\ (Assets)_{\ it} + \beta_6 Ln\ (Firm^{Age})_{it} + \beta_7 VOL_{it} + \beta_8 RiskRet_{it} + \beta_9 DeInMarket_{it} + \beta_{10} Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (5)$$

where *ASize*(3), *ASize*(4), and *ASize*(5) are the number of audit committee members: three, four, or five, respectively (dummy variable equals 1 if the firm has up to five, and 0 otherwise).

We test CEO characteristics in the combined variable *INDVAR* (CEO^{Age}, RET^{Age}, *CEO turnover*) as follows.

$$PERF_{it} = \alpha + \beta_1 INDVAR_{it} + \beta_2 Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{\ it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (6)$$

where CEO^{Age} is a number equal to the CEO's age; RET^{Age} is the CEO's retirement age (dummy variable equals 1 if the CEO is age 60 or over, and 0 otherwise); CEO turnover is a dependent dummy variable that equals 1 if the CEO changed, and 0 otherwise.

The empirical test for managerial pay using RE and FE is as follows.

$$PERF_{it} = \alpha + \beta_1 D - INC_{it} + \beta_2 CEO - Ex - Pay_{it} + \beta_3 CEO - Shares_{it} + \beta_4\ COE - Ten_{it} + \beta_5 Ln\ (BS)_{it} + \beta_6 Ln\ (Assets)_{\ it} + \beta_7 Ln\ (Firm^{Age})_{it} + \beta_8 VOL_{it} + \beta_9 RiskRet_{it} + \beta_{10} DeInMarket_{it} + \beta_{11} Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (7)$$

where $D - INC$ represents the director incentives (in Saudi riyals (SAR)); these are salary bonuses or attendance allowance for meetings or expense allowance or benefits in kind or a certain percentage of firm profits that may combine two or more of these advantages, expressed annually); $CEO - Ex - Pay$ represents the CEO and top executive pay (in SAR) (this is the sum of the CEO and the senior executive salaries, allowances, in-kind benefits, and end-of-service bonus rewards, expressed annually). The control variables are $CEO - Shares$, which are the percentage of CEO-owned shares (total CEO shares divided by total firm shares); $COE - Ten$ represents CEO tenure (number of years the CEO has held office).

The above-the-mean calculation assesses the impact of the above-the-mean director incentives and above-the-mean CEO and executive pay as follows.

$$PERF_{it} = \alpha + \beta_1 Above\ mean\ D - INC_{it} + \beta_2 Above\ mean\ CEO - Ex - Pay_{it} + \beta_3\ CEO - Shares_{it} + \beta_4\ COE - Ten_{it} + \beta_5 Ln\ (BS)_{it} + \beta_6 Ln\ (Assets)_{\ it} + \beta_7 Ln\ (Firm^{Age})_{it} + \beta_8 VOL_{it} + \beta_9 RiskRet_{it} + \beta_{10} DeInMarket_{it} + \beta_{11} Ln\ (gross\ written)_{it} + \varepsilon_{it}. \quad (8)$$

4.1. Difference-in-Differences Approach

According to Bertrand and Mullainathan (2003) and Al-Faryan (2021), the DID technique is widely used in the economics and finance literature to address endogeneity. We generate two variables in our DID and DID2 models. The first is a dummy variable that

equals 1 in the post-regulation years from 2009 to 2014, and 0 otherwise. This indicator is referred to as '*post-regulation*'. The treatment variable for DID is also a dummy variable that equals 1 if the percentage of independent members on the board is higher than or equal to one-third, and 0 otherwise. In addition, the treated variable for DID2 is a dummy variable that equals 1 if the audit committee size is greater than or equal to three members, and 0 otherwise. We refer to this variable as '*treated*' and then multiply *post-regulation* by *treated* to create a new variable to represent the influence of the difference between organisations that complied with the corporate governance standards after 2008 and those that did not. We include the variable '*Treated*Post regulation*' for robustness in the RE and FE models to avoid any bias when comparing the treatment and control groups that may have occurred from variations in groups over time (Al-Faryan 2021). For this comparison, the Saudi insurance firms had to exist before the change in rules (i.e., before the end of 2008). As a result, we exclude 14 of the 35 listed Saudi insurance corporations in our sample according to this criterion. Our study looks at the exogenous shock of insurance regulation and compares the performance of companies complying with the new regulations with those that did not comply. Concerning the built-in endogeneity difficulties, we reduce their presence by introducing the board composition and audit committee changes at Saudi enterprises as a consequence of governance legislation rather than endogenously imposed by insurance industry features (Al-Faryan 2021). In this regard, the change in insurance governance regulations in the KSA allows us to investigate the effects of board composition and audit committee size on performance using the following models.

$$PERF_{it} = \alpha + \beta_1 DID_{\ it} + \beta_2 Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{\ it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (9)$$

$$PERF_{it} = \alpha + \beta_1 DID2_{\ it} + \beta_2 Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{\ it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (10)$$

where *DID* represents the DID in board composition, while *DID2* represents the DID in the size of the audit committee. *DID* and *DID2* capture the *Treated*post-regulation*, the *treated* group multiplied by *post-regulation*.

4.2. Probit Model Average Marginal Effect

The average marginal effect yields a probability effect; namely, a value between 0 and 1. It is the average probability change when x rises by one unit. Because a probit model is nonlinear, the effect will vary from one individual to another. The average marginal effect is calculated by computing it for each individual and then creating an average.

We use the following equations for this model.

$$CEO\ turnover_{it} = \alpha + \beta_1 PERF_{\ it} + \beta_2 Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{\ it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (11)$$

$$Above\ mean\ director\ incentive_{\ it} = \alpha + \beta_1 PERF_{\ it} + \beta_2 Above\ mean\ CEO\ and\ Top\ Executive\ pay_{it} + \beta_3 CEO - Shares_{it} + \beta_4\ COE - Ten_{it} + \beta_5 Ln\ (BS)_{it} + \beta_6 Ln\ (Assets)_{\ it} + \beta_7 Ln\ (Firm^{Age})_{\ it} + \beta_8 VOL_{it} + \beta_9 RiskRet_{it} + \beta_{10} DeInMarket_{it} + \beta_{11} Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (12)$$

$$Above\ mean\ CEO\ and\ Top\ Executive\ pay_{it} = \alpha + \beta_1 PERF_{\ it} + \beta_2 Above\ mean\ director\ incentive_{\ it} + \beta_3 CEO - Shares_{it} + \beta_4\ COE - Ten_{it} + \beta_5 Ln\ (BS)_{it} + \beta_6 Ln\ (Assets)_{\ it} + \beta_7 Ln\ (Firm^{Age})_{\ it} + \beta_8 VOL_{it} + \beta_9 RiskRet_{it} + \beta_{10} DeInMarket_{it} + \beta_{11} Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (13)$$

where *CEO Turnover*, *Above mean director incentive*, and *Above mean CEO and Top Executive Pay* are the dependent dummy variables that equal 1 if the CEO changed and the number was above the mean, and 0 otherwise. The independent variable is still *PERF* where firm performance equates to ROA, ROE, or Tobin's Q. All control variables are as before and include *Above mean director incentive* with *Above mean CEO and Top Executive Pay*.

4.3. Shariah Compliance and Life Insurance Firms

To investigate the effects of Shariah compliance and life insurance firms to board composition and the size of the audit committee on performance using the following models:

$$PERF_{it} = \alpha + \beta_1 \%IB * \ Shariah - compliant_{it} + \beta_2 \ Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (14)$$

$$PERF_{it} = \alpha + \beta_1 SAC * Shariah - compliant_{it} + \beta_2 \ Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (15)$$

where *Shariah-compliant* is a dummy variable that equals 1 if the firm adheres to Islamic Shariah provisions in all of its transactions, insurance operations, and investment activities, and 0 otherwise; *%IB*Shariah-compliant* is board composition multiplied by the Shariah-compliant variable; *SAC* Shariah-compliant* is the size of the audit committee multiplied by the Shariah-compliant variable measuring Islamic corporate governance or the corporate governance of Shariah-compliant insurance firms. Other variables are as explained previously.

$$PERF_{it} = \alpha + \beta_1 \%IB * \ Life\ insurance_{it} + \beta_2 \ Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (16)$$

$$PERF_{it} = \alpha + \beta_1 SAC * Life\ insurance_{it} + \beta_2 \ Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{it} + \beta_4 Ln\ (Firm^{Age})_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}, \quad (17)$$

Herein, *life insurance* is a dummy variable that equals 1 if the firm has contracts between insurance policyholders and an insurer, or assurer, in which the insurer guarantees to pay a specified beneficiary a sum of money upon the insured person's death (often the policyholder)—other occurrences, such as terminal or severe illness, may also trigger payment depending on the contract (typically, the policyholder pays a premium, either on a monthly basis or in one lump sum. Other expenditures may be covered by the benefits of insurance; they may be conventional or takaful (Islamic) life insurance)—and 0 otherwise; *%IB* Life insurance* is board composition multiplied by the life insurance variable; *SAC* Life insurance* is the size of the audit committee (those who monitor corporate governance at firms that provide life insurance) multiplied by the life insurance variable. Other variables are as explained previously.

5. Results and Discussion

Table 1 provides summary statistics of the key variables in our study. The standard deviations of ROA, ROE, *CEO-Ex-Pay*, *CEO-Shares (%)*, *CEO Turnover*, and *VOL*, six of the 18 variables, are significantly greater than the mean. This suggests that our data are dispersed extensively or that the mean is not accurately reflecting the data. The average board has a mean of 46.43% and a median of 40% independent members. The average board size is 8 to 9 directors, with a minimum of 5 and a maximum of 11. The average size of the audit committee is three, with a maximum of five. The average CEO age is 50 to 51, with a standard deviation of eight years. The average CEO tenure is three years, with a standard deviation of two years. The minimum and maximum CEO tenure are one and nine years, respectively. The dummy variable, *CEO Turnover*, has a mean value of 0.233 and a standard deviation of 0.424. In addition, there are missing observations in some years for some variables, revealing that some firms had losses that accounted for more than 50% of their capital, leading to the suspension of trading or bankruptcy. Thus, we exclude such data from our study.

Table 1. Summary Statistics.

Variable	Observations	Mean	Median	Minimum	Maximum	Standard Deviation
ROA	210	−3.5922	−0.9512	−51.8177	6.7045	8.2787
ROE	210	−9.5561	−2.1808	−159.0127	30.3397	26.9908
Tobin's Q	210	3.7773	2.8018	0.3335	16.9274	3.1330
%IB	210	46.4327	40	20	100	17.7373
SAC	210	3.1143	3	0	5	0.6461
D-INC (SAR)	210	1,004,805	770,500	0	9,530,000	1,133,655
CEO-Ex-Pay (SAR)	210	5,146,216	4,374,000	0	23,002,000	3,736,234
CEO-Shares (%)	210	0.5228	0	0	45.5013	4.4401
CEO-Ten	210	3.0667	3	1	9	1.9504
CEO^{Age}	210	50.6714	50	33	77	8.4904
CEO Turnover	210	0.2333	0	0	1	0.4240
BS	210	8.5571	9	5	11	1.6041
Ln(Assets)	210	19.4193	19.2131	17.1995	23.0224	1.1235
$Firm^{Age}$	210	5.7238	5	1	29	4.3031
VOL	210	16.8407	12.7224	3.8282	280.1844	20.9670
RiskRet (%)	210	64.6286	67.5255	0	99.9934	21.9242
DeInMarket (%)	210	0.8944	0.90	0.62	1.10	0.1590
Ln(gross written)	210	23.6997	23.6412	23.1138	24.1404	0.3064

ROA, ROE, and Tobin's Q are performance measures. *%IB* is the board composition. *SAC* is the size of the Audit Committee *D-INC* is director incentives (in Saudi riyals (SAR)). *CEO-Ex-Pay* is the CEO and top executive pay (in Saudi riyals (SAR)). *CEO-Shares(%)* is the percentage of CEO-owned shares. *CEO-Ten* is CEO tenure. CEO^{Age} is the CEO age. *CEO Turnover* is a dependent dummy variable that takes 1 if the CEO changed, and 0 otherwise. *BS* is the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Firm^{Age}$ is the firm age. *VOL* is volatility. *RiskRe* is (risk retention) net premiums written over gross premiums written, and *DeInMarket* is (depth of insurance market) defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

We do not use the time fixed effects in the models because we do not want to increase the number of predictors with regard to the sample size. As stated previously, the number of firms increase in the timeframe examined (21 listed insurance firms in 2008 and 35 by the end of 2014). Thus, the number of observations is not equal each year; adding time dummies (increasing explanatory variables) would have affected the significance of the estimates and omitted-variable bias in 2013 and 2014.

Table 2 provides a correlation matrix of the variables in the analysis. As expected, there is a strong correlation relationship between ROA and ROE (0.7233); therefore, we do not include these in the same empirical model. Additionally, there is a strong negative correlation between Tobin's Q and *Ln(Assets)* (−0.6635) in all cases, as Tobin's Q is calculated by dividing firm market capital by total assets. *CEO-Ex-Pay* and *Ln(Assets)* are positively correlated (0.4941). This is as expected, as larger firms are more likely to pay their senior executives more. Expectedly, *CEO-Ex-Pay* and *CEO tenure* are also positively correlated (0.4636), as the longer the CEO holds office, the larger the increase in the CEO's salary. The relationship between *CEO Turnover* and *CEO tenure* will always be negative (−05860); if the CEO holds office until retirement, the CEO will not change until after that. *Ln(gross written)* and *Ln(firm age)* have a positive correlation (0.5688), which implies that written gross premiums increase over time. The remaining variables do not show a strong correlation.

Table 2. Correlation Matrix.

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	VIF
1	*ROA*	1																		
2	*ROE*	0.7233 *** (0.0000)	1																	
3	*Tobin's Q*	−0.2475 *** (0.0003)	−0.2906 *** (0.0000)	1																
4	*%IB*	0.0511 (0.4615)	−0.1123 (0.1046)	−0.0406 (0.5584)	1															1.17
5	*SAC*	−0.0379 (0.5849)	0.0386 (0.5782)	0.0036 (0.9582)	−0.0032 (0.9634)	1														1.13
6	*D-INC*	0.1526 ** (0.0271)	0.0575 (0.4072)	−0.0151 (0.8282)	0.0793 (0.2529)	0.1082 (0.1181)	1													1.27
7	*CEO-Ex-Pay*	0.2707 *** (0.0001)	0.2253 *** (0.0010)	−0.1988 *** (0.0038)	0.0742 (0.2847)	0.0309 (0.6564)	0.2239 *** (0.0011)	1												1.82
8	*CEO-Shares (%)*	0.1155 * (0.0952)	0.1117 (0.1066)	−0.0770 (0.2669)	−0.0090 (0.8974)	−0.0204 (0.7690)	0.0181 (0.7946)	0.3053 *** (0.0000)	1											1.17
9	*CEO-Ten*	0.3033 *** (0.0000)	0.1828 *** (0.0079)	−0.2042 *** (0.0029)	0.0127 (0.8545)	0.0888 (0.1997)	0.2064 *** (0.0027)	0.4636 *** (0.0000)	0.1516 ** (0.0281)	1										2.93
10	CEO^{Age}	0.1586 ** (0.0215)	0.1080 (0.1186)	−0.1328 * (0.0546)	0.0178 (0.7972)	0.0339 (0.6251)	0.2444 *** (0.0004)	0.1774 *** (0.0100)	0.2122 *** (0.0020)	0.3911 *** (0.0000)	1									1.44
11	*CEO Turnover*	−0.2045 *** (0.0029)	−0.1928 *** (0.0051)	0.0846 (0.2222)	0.0430 (0.5350)	−0.0803 (0.2464)	−0.0713 (0.3036)	−0.1160* (0.0936)	−0.0650 (0.3489)	−0.5860 *** (0.0000)	−0.2152 *** (0.0017)	1								1.79
12	*Ln(BS)*	−0.0446 (0.5203)	−0.0377 (0.5867)	0.0450 (0.5163)	−0.0026 (0.9704)	0.0718 (0.3001)	0.1796 *** (0.0091)	−0.0221 (0.7498)	0.0585 (0.3990)	−0.1847 *** (0.0073)	0.0452 (0.5146)	0.0782 (0.2589)	1							1.17
13	*Ln(Assets)*	0.3439 *** (0.0000)	0.3525 *** (0.0000)	−0.6635 *** (0.0000)	−0.0087 (0.9002)	0.1693 ** (0.0141)	0.2606 *** (0.0001)	0.4941 *** (0.0000)	0.1455** (0.0352)	0.4062 *** (0.0000)	0.2271 *** (0.0009)	−0.1559 ** (0.0239)	−0.1378 ** (0.0461)	1						1.66
14	$Ln(Firm^{Age})$	0.3760 *** (0.0000)	0.1186 * (0.0866)	−0.1211 * (0.0799)	0.3290 *** (0.0000)	0.1242 * (0.0725)	0.2504 *** (0.0002)	0.3348 *** (0.0000)	0.0274 (0.6930)	0.4280 *** (0.0000)	0.1615 ** (0.0192)	−0.0340 (0.6246)	−0.1389 ** (0.0443)	0.3497 *** (0.0000)	1					2.45
15	*VOL*	−0.1022 (0.1399)	−0.0298 (0.6677)	0.2069 *** (0.0026)	−0.0622 (0.3700)	0.1993 *** (0.0037)	−0.0592 (0.3933)	−0.1826 *** (0.0080)	−0.0352 (0.6119)	−0.1264 * (0.0675)	−0.0919 (0.1844)	0.1100 (0.1119)	0.1113 (0.1077)	−0.0994 (0.1512)	−0.2509 *** (0.0002)	1				1.23
16	*RiskRet*	0.1827 *** (0.0080)	0.0577 (0.4058)	−0.0261 (0.7068)	0.1176 * (0.0892)	0.0669 (0.3350)	0.1482 ** (0.0318)	0.2497 *** (0.0003)	0.0196 (0.7775)	0.2562 *** (0.0002)	−0.0889 (0.1995)	−0.0606 (0.3820)	−0.0506 (0.4660)	0.1331* (0.0542)	0.3049 *** (0.0000)	−0.1085 (0.1171)	1			1.24
17	*DeInMarket*	0.0321 (0.6438)	−0.0019 (0.9782)	0.0070 (0.9200)	0.0647 (0.3509)	0.0296 (0.6701)	0.0163 (0.8148)	0.0531 (0.4436)	−0.0825 (0.2339)	0.1004 (0.1470)	−0.0526 (0.4487)	−0.0195 (0.7788)	−0.0677 (0.3291)	0.0433 (0.5324)	0.1925 *** (0.0051)	−0.0942 (0.1740)	0.1901 *** (0.0057)	1		1.33
18	*Ln(gross written)*	0.1547 ** (0.0250)	0.0037 (0.9572)	0.1205 * (0.0814)	0.1859 *** (0.0069)	0.0368 (0.5960)	0.1786 *** (0.0095)	0.2538 *** (0.0002)	0.0005 (0.9945)	0.2602 *** (0.0001)	−0.0914 (0.1872)	−0.0011 (0.9875)	−0.1107 (0.1098)	0.0669 (0.3349)	0.5688 *** (0.0000)	−0.0601 (0.3865)	0.2493 *** (0.0003)	0.4477 *** (0.0000)	1	2.13

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. The *p*-values are in parentheses. VIF is the variance inflation factor. The mean of VIF is 1.60.

Multicollinearity refers to variables that are highly correlated with each other. The variance inflation factor (VIF) is a measure of multicollinearity. For regression models, the VIF is the ratio of the model variance to the model variance after the introduction of a single independent variable. However, all of our independent variables and the mean values of the VIFs are less than 3, indicating no multicollinearity. It is well established that the higher the VIF, the less accurate the regression findings; VIFs greater than 10 show a high correlation (multicollinearity) and should be concerning.

Most studies on board composition utilise ratios or linkage to quantify the degree of board independence. Many governance authorities also stipulate a minimum number of independent directors. As stated, the minimum number of independent directors required in the KSA is two, or one-third of the total number of directors, whichever is larger. In Table 3, in RE Model 1, board composition (*%IB*) shows a significant negative relationship with ROE and Tobin's Q, with coefficients of −0.2221 and −0.0176, respectively, at 10% significance. This result is in line with Arif (2019). The result is also in line with the FE model for the *%IB*, which shows a significantly negative relationship with ROE (−0.3862) at 5% significance. Thus, these findings do not support Hypothesis 1. The *%IB* with the four binary dummy variables, *IB*(3), *IB*(4), *IB*(5), and *IB*(6), are shown in Model 2, indicating the presence of three, four, five, or six or more independent directors on a board.

These findings also reveal no statistically significant effect between the number of independent directors and ROA or Tobin's Q, as Akeem et al. (2014) found. In addition, after excluding *IB*(6) in the RE (−16.5177) and FE (−26.6009) models, there is a significantly negative relationship with ROE at 10% and 5% significance, respectively. Once again, Hypothesis 1 is not supported. When the number of independent board members reaches six or more, the effect is negative on firm performance (ROE). This can be attributed to a lack of knowledge and experience or operational weakness in board efficiency within the insurance company. Our findings support those of Al-Faryan (2017), which show that independent directors are associated with negative firm performance, significant at the 10% level, using the Fama–French three-factor model. In studies of Chinese board independence and firm performance, Liu et al. (2015), looking at ROA and ROE, and Li et al. (2015), looking at ROA and Tobin's Q in an opposite sign, found a significantly positive relationship between independent directors and firm performance. Liu et al. (2015) and Al-Faryan (2021) also found that boards having at least two and up to five or more independent directors had a significantly positive impact on performance. Broome et al. (2011) argue that independent directors are required for a board to be efficient and achieve critical mass; otherwise, there is a tendency for boards to have no perceptible influence on the firm's monitoring or decisions.

Table 4 shows the results of including an additional variable *(%IB*VOL)*, which measures monitoring costs in the original model (Table 3). The board composition (*%IB*) coefficient indicates a significantly negative relationship with ROE in the RE (−0.3635) and FE (−0.7037) models, respectively, and with Tobin's Q in the RE model (−0.0272) at 5%, 1%, and 10% significance, respectively. This result is in line with the results of Al-Faryan (2021) and Maug (1997), except in the FE model for ROA, and, as already stated, rejects Hypothesis 1. The conclusion is that a higher percentage of independent directors on the board contributes to worse performance among Saudi insurance firms. The ROE results show that *%IB* has a significantly negative relationship at −0.7037 (RE) at 1% significance. Meanwhile, *%IB*VOL* shows a positive relationship at 1.5229 (RE) at 10% significance, failing to support Hypothesis 3. Insurance firms need to monitor independent board members, which leads to an increase in costs due to the weakness of the expertise of the independent board members or their understanding of the characteristics of the Saudi insurance market, which differ from the West. This then affects the performance of the company and contributes to company losses. Moreover, higher monitoring costs lead to a decrease in the benefits associated with the number of outside directors and board independence (Adams and Ferreira 2007; Al-Faryan 2021; Raheja 2005).

Table 3. The effect of board composition and board independent dummies on insurance performance.

	ROA				ROE				Tobin's Q			
	RE		FE		RE		FE		RE		FE	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	3.7967 (67.5470)	−6.3250 (67.0689)	61.0747 (119.1293)	27.2824 (120.7192)	−107.7824 (200.2462)	−144.5460 (202.4618)	−37.4082 (469.4880)	−218.9571 (474.3023)	24.6199 (18.9903)	19.0928 (18.4566)	59.6413 * (35.9481)	60.1045 * (36.5258)
IB(3)		1.5871 (1.9019)		1.6737 (2.1202)		3.6853 (6.7005)		3.5985 (8.3303)		−0.0810 (0.5729)		−0.4672 (0.6415)
IB(4)		−1.8699 (2.2677)		−1.1789 (2.4949)		−5.4985 (7.9249)		−5.3803 (9.8023)		−0.0158 (0.6813)		−0.4136 (0.7549)
IB(5)		−3.3046 (2.5441)		−3.2452 (2.7010)		−6.6657 (9.1131)		−9.8676 (10.6123)		0.3880 (0.7736)		0.0359 (0.8172)
IB(6)		−1.4723 (2.5587)		−1.3378 (2.8331)		−16.5177 * (8.7572)		−26.6009 ** (11.1314)		−1.1588 (0.7618)		−1.3927 (0.8572)
%IB	−0.0451 (0.0366)		−0.0505 (0.0427)		−0.2221 * (0.1143)		−0.3862 ** (0.1685)		−0.0176 * (0.0106)		−0.0155 (0.0129)	
Ln(BS)	3.1286 (3.4136)	5.8437 (4.0037)	6.9750 (4.8228)	10.0082 * (5.1385)	1.9347 (9.7098)	13.3729 (12.8572)	4.5417 (19.0065)	22.4153 (20.1892)	−0.8803 (0.9607)	−0.5479 (1.1509)	−0.9411 (1.4553)	−0.5199 (1.5548)
Ln(Assets)	2.0085 *** (0.7493)	2.0220 *** (0.7525)	3.3110 *** (1.2253)	3.1229 ** (1.2654)	8.3389 *** (1.9449)	7.9351 *** (2.0196)	17.9176 *** (4.8290)	15.3649 *** (4.9718)	−2.1879 *** (0.2050)	−2.1916 *** (0.1973)	−2.9659 *** (0.3697)	−3.0261 *** (0.3829)
$Ln\left(Firm^{Age}\right)$	7.1902 *** (1.8539)	7.1526 *** (1.8348)	10.6234 *** (3.4496)	9.8178 *** (3.4919)	3.5480 (4.9939)	4.8734 (5.0983)	11.8276 (13.5947)	8.7395 (13.7194)	0.7480 (0.5107)	0.6762 (0.4878)	1.4098 (1.0409)	1.4832 (1.0565)
VOL	0.0310 (0.0250)	0.0353 (0.0249)	0.0610 ** (0.0277)	0.0634 ** (0.0277)	0.0229 (0.0887)	0.0387 (0.0885)	0.0913 (0.1092)	0.0953 (0.1087)	0.0255 *** (0.0075)	0.0247 *** (0.0075)	0.0276 *** (0.0084)	0.0268 *** (0.0084)
RiskRet	0.0189 (0.0275)	0.0166 (0.0275)	0.0008 (0.0315)	−0.0038 (0.0320)	0.0230 (0.0899)	0.0245 (0.0913)	0.0286 (0.1240)	0.0711 (0.1258)	0.0045 (0.0081)	0.0056 (0.0081)	0.0055 (0.0095)	0.0087 (0.0097)
DeInMarket	−0.5144 (3.2055)	−0.3909 (3.2198)	1.1928 (3.3645)	1.1752 (3.3886)	−1.1806 (12.3392)	−0.3115 (12.3168)	1.6937 (13.2596)	0.7829 (13.3139)	−0.3346 (0.9796)	−0.4015 (1.0059)	0.1062 (1.0153)	0.0054 (1.0253)
Ln(gross written)	−2.6890 (2.7749)	−2.5833 (2.7531)	−6.7638 (5.1649)	−5.4789 (5.2529)	−2.6990 (8.2831)	−2.2699 (8.3497)	−14.1485 (20.3549)	−6.4116 (20.6384)	0.9626 (0.7798)	1.1465 (0.7575)	0.0557 (1.5586)	0.0289 (1.5893)
Wald Chi^2	53.45 ***	60.64 ***			29.20 ***	35.48 ***			137.57 ***	150.52 ***		
F Statistic			6.42 ***	5.07 ***			2.94 ***	2.63 ***			9.35 ***	7.10 ***
R^2 (%)	19.52	22.49	18.09	20.20	13.85	16.49	13.66	16.06	50.50	51.83	49.32	49.94

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects. FE is fixed effects. *%IB* is the board composition. *IB*(3) … *IB*(6) are the number of independent members. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln\left(Firm^{Age}\right)$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* is (risk retention) net premiums written over gross premiums written, and *DeInMarket* is (depth of insurance market) defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

Table 4. The effect of board composition and monitoring costs on insurance performance.

	ROA		ROE		Tobin's Q	
	RE	**FE**	**RE**	**FE**	**RE**	**FE**
Constant	3.1860 (68.1176)	58.1408 (119.5856)	−115.6148 (201.3361)	−81.8409 (467.1969)	24.0202 (19.0004)	58.1242 (36.0419)
%IB	−0.0666 (0.0536)	−0.0714 (0.0628)	−0.3635 ** (0.1707)	−0.7037 *** (0.2454)	−0.0272 * (0.0156)	−0.0263 (0.0189)
*%IB*VOL*	0.1147 (0.2107)	0.1006 (0.2203)	0.8457 (0.7714)	1.5229 * (0.8607)	0.0539 (0.0637)	0.0520 (0.0664)
Ln(BS)	3.3969 (3.4598)	7.2435 (4.8699)	3.0658 (9.8399)	8.6085 (19.0257)	−0.7904 (0.9664)	−0.8022 (1.4677)
Ln(Assets)	2.0120 *** (0.7570)	3.2580 *** (1.2337)	8.4244 *** (1.9663)	17.1137 *** (4.8199)	−2.1887 *** (0.2049)	−2.9934 *** (0.3718)
Ln($Firm^{Age}$)	7.2352 *** (1.8717)	10.5759 *** (3.4593)	3.4240 (5.0430)	11.1076 (13.5149)	0.7409 (0.5106)	1.3852 (1.0426)
VOL	−0.0127 (0.0852)	0.0220 (0.0900)	−0.3032 (0.3114)	−0.5007 (0.3517)	0.0046 (0.0257)	0.0074 (0.0271)
RiskRet	0.0199 (0.0277)	0.0023 (0.0317)	0.0297 (0.0905)	0.0518 (0.1239)	0.0050 (0.0081)	0.0063 (0.0096)
DeInMarket	−0.3512 (3.2141)	1.2777 (3.3777)	−0.0556 (12.3495)	2.9798 (13.1959)	−0.2696 (0.9838)	0.1501 (1.0180)
Ln(gross written)	−2.6656 (2.8003)	−6.5882 (5.1915)	−2.3550 (8.3258)	−11.4888 (20.2821)	0.9933 (0.7805)	0.1465 (1.5647)
Wald Chi^2	53.66 ***		30.18 ***		138.29 ***	
F Statistic		5.70 ***		3.00 ***		8.36 ***
R^2 (%)	19.51	18.13	14.13	14.02	50.75	49.64

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects. FE is fixed effects. *%IB* is the board composition. *%IB*VOL* is board composition multiplied by volatility. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. *Ln*($Firm^{Age}$) is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* (risk retention) are net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

We can then ask who can be an effective board member of an insurance firm with sufficient competence and experience to monitor the firm in such a way as to reduce monitoring costs while supporting high performance? The answer may be an individual with practical experience in the market or local actuaries, as opposed to international experts who do not have local market experience or local knowledge. This implies that the increased monitoring costs faced by independent directors will lead to increasing the performance of Saudi insurance firms, a result that contrasts with Liu et al. (2015) and Al-Faryan (2021) regarding ROE (FE).

Table 5 shows no effects for the size of the audit committee (*SAC*) on insurance firm performance in all estimates in Model 1. Thus, Hypothesis 4 is not supported. The auditors play a large representative role, as they are concerned with personal interests rather than those of the company, and this characteristic applies to management as well. Our results support those of Ghabayen (2012) and Al-Faryan (2017), who found that the *SAC* has a very small insignificant negative coefficient, which means that firm audit committee size has no significant relation with performance at Saudi insurance firms. In Model 2, we replace the *SAC* with three binary dummy variables: *ASize*(3), *ASize*(4), and *ASize*(5), which indicate the presence of three, four, or five audit committee members, respectively. The results reveal no significant relationship between all *ASize* and ROE, as also evidenced in Datta (2018), Ghabayen (2012), and Yemane et al. (2015). However, ROA and Tobin's Q, excluding Tobin's Q with *ASize*(4), underestimate RE (1.5592) and relate positively with Tobin's Q at 10% significance, which supports Hypothesis 4. In contrast, ROA and *ASize*(5) underestimate RE (−6.3918) and relate negatively at 10% significance, thus rejecting Hypothesis 4. This supports the findings of Maharjan (2019), Fadun (2013), and Fekadu (2015).

Table 5. The effect of audit committee size and audit size dummies on insurance performance.

	ROA				**ROE**				**Tobin's Q**			
	RE		**FE**		**RE**		**FE**		**RE**		**FE**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	−0.7568 (66.2930)	−17.0516 (65.3392)	70.3277 (119.3659)	13.4274 (120.9539)	−128.2512 (200.3712)	−65.3339 (201.7822)	30.6686 (475.7870)	37.3265 (488.2025)	19.8334 (18.4676)	12.5247 (18.3795)	62.2754 * (36.0115)	56.3933 (37.0938)
Asize(3)		3.2457 (2.4301)		2.3579 (2.5065)		10.7974 (9.3119)		8.8437 (10.1168)		0.8168 (0.7738)		0.2252 (0.7687)
Asize (4)		0.6149 (2.9607)		1.7790 (3.1422)		−1.5203 (10.8822)		0.9108 (12.6827)		1.5592* (0.9246)		0.5412 (0.9636)
Asize(5)		−6.3918 * (3.7450)		−5.0099 (4.1198)		2.7059 (13.6267)		4.6029 (16.6285)		0.2239 (1.1622)		−0.1812 (1.2634)
SAC	−0.9297 (0.8399)		−0.2046 (0.9055)		−0.9085 (2.9667)		0.7950 (3.6094)		0.2483 (0.2527)		0.1118 (0.2732)	
Ln(BS)	3.4397 (3.3875)	4.0481 (3.2906)	7.3399 (4.8983)	8.0246 (4.8937)	1.7093 (9.7169)	1.7133 (9.6616)	5.3580 (19.5243)	2.9538 (19.7521)	−0.9704 (0.9374)	−0.7598 (0.9139)	−0.9753 (1.4778)	−0.7952 (1.5008)
Ln(Assets)	2.1600 *** (0.7299)	2.1891 *** (0.7029)	3.5107 *** (1.2260)	3.4694 *** (1.2091)	8.8583 *** (1.9291)	9.3439 *** (1.9202)	19.1632 *** (4.8867)	19.4286 *** (4.8803)	−2.1195 *** (0.1951)	−2.1076 *** (0.1876)	−2.9256 *** (0.3699)	−2.9266 *** (0.3708)
$Ln\left(Firm^{Age}\right)$	6.5863 *** (1.7628)	6.2249 *** (1.7084)	10.4731 *** (3.4613)	8.7540 ** (3.4968)	0.8718 (4.7850)	2.4242 (4.7664)	10.4817 (13.7965)	9.5211 (14.1139)	0.4703 (0.4738)	0.3711 (0.4583)	1.3493 (1.0442)	1.2064 (1.0724)
VOL	0.0322 (0.0254)	0.0445 * (0.0250)	0.0594 ** (0.0278)	0.0594 ** (0.0275)	0.0221 (0.0920)	0.0386 (0.0935)	0.0739 (0.1110)	0.0722 (0.1112)	0.0232 *** (0.0077)	0.0254 *** (0.0078)	0.0267 *** (0.0084)	0.0268 (0.0084)
RiskRet	0.0193 (0.0274)	0.0169 (0.0265)	−0.0027 (0.0316)	0.0024 (0.0312)	0.0172 (0.0901)	0.0080 (0.0896)	−0.0072 (0.1259)	0.0082 (0.1258)	0.0029 (0.0080)	0.0024 (0.0079)	0.0038 (0.0095)	0.0042 (0.0096)
DeInMarket	−0.5157 (3.2299)	0.6701 (3.1885)	1.3966 (3.3736)	1.3439 (3.3553)	−1.2593 (12.4940)	3.1063 (12.5623)	3.2645 (13.4468)	5.0412 (13.5428)	−0.4051 (1.0010)	−0.4078 (1.0265)	0.1695 (1.0178)	0.1144 (1.0290)
Ln(gross written)	−2.5754 (2.7244)	−2.2153 (2.6978)	−7.4096 (5.1594)	−5.0422 (5.2231)	−2.3583 (8.3071)	−6.1528 (8.4508)	−18.8359 (20.5650)	−19.3736 (21.0819)	1.0762 (0.7599)	1.3590* (0.7630)	−0.1234 (1.5565)	0.1245 (1.6018)
Wald Chi^2	52.85 ***	68.85 ***			25.24 ***	31.43 ***			143.91 ***	155.70 ***		
F Statistic			6.20 ***	5.68 ***			2.22 **	1.95 **			9.12 ***	7.28 ***
R^2 (%)	20.48	26.66	17.91	21.98	12.57	15.05	12.07	13.46	50.15	51.22	48.53	49.05

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects, and FE is fixed effects. *SAC* is the size of the Audit Committee. *Asize*(3) … *Asize*(5) are the number of Audit Committee members. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln\left(Firm^{Age}\right)$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* is risk retention as net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

This means that below *ASize*(4), there is no effect on insurance performance, while there is a positive effect on insurance performance when there are four members. A committee of more than four has a negative effect on insurance performance. Thus, when the *SAC* is five, it becomes ineffective. One possible reason may be that with five or more, operations and responsibilities may be abandoned, and committees may fail to complete the tasks they are supposed to do quickly and accurately; however, a smaller SAC, such as *ASize*(4), relates positively to firm performance.

Table 6 shows the results of Model 1. The DID for board composition indicates that the performance measures of ROA in the RE (3.8821) and FE (3.0084) models, Tobin's Q in the RE (0.7917) and FE (0.9705) models, and ROE in the RE (12.8994) model, except for the FE model, are significantly positive with performance at 5% and 10% significance for ROA (RE) and Tobin's Q (FE) for the listed Saudi insurance firms that implemented the 2009 post-corporate governance regulations (stipulating that at least two or one-third of the directors must be independent). These results support Hypothesis 2. According to our data and the annual reports, all of the listed Saudi insurance firms in our sample, except for four, implemented immediately the SAMA and CMA corporate governance regulations as per the expected date. The insurance firms generally complied with the corporate governance regulations, as fines for non-compliance had doubled. Our results support those of Liu et al. (2015), who found significantly positive relationships with ROA and ROE in the Chinese market; however, there is a non-significantly positive relationship with ROE under the FE model. Al-Faryan (2021) found the opposite sign with ROA, while supporting our result for Tobin's Q among the listed Saudi firms.

Model 2 assesses the effect of the board of directors' establishment of audit committees per regulations. According to an amendment to the audit committee regulation in 2017, the audit committee must be formed by a decision of the company's ordinary general assembly; the members of the committee will be shareholders or others, provided that at least one is an independent member and that no member is an executive director. As stated, the SAC must not be less than three or more than five and include one member who is a specialist in financial and accounting matters. In Model 1, similar to the reason for immediately implementing independent board members in the year of regulation, the difference in the result is that insurance firms that applied the 2009 regulation regarding SAC show a positive effect on performance, as shown in Model 2, wherein the measure of ROA in the RE (7.0552) and FE (6.8950) models and of Tobin's Q in the FE (1.3653) model are positive at 1% significance and the others at 5% significance. These results support Hypothesis 5. After the regulation, three of the listed insurance firms had fewer than three members on their audit committees, and four had fewer than two or one-third independent board members. These firms that were non-compliant with the corporate governance regulations were fined.

Table 7 presents the results for the relationship between CEO age and insurance performance in the RE and FE models. We found a significantly positive relationship in the Tobin's Q models but not in the ROA and ROE models. In Model 1, CEO age has a significantly positive effect on Tobin's Q in the RE (0.0382) and FE (0.0668) models at 10% and 5% significance, respectively.

Model 2 uses a CEO retirement dummy variable equal to 1 if the CEO is aged 60 or above, and 0 otherwise. The results show that the CEO retirement age has a significantly positive effect on Tobin's Q in the RE (1.2933) and FE (1.5081) models at 1% significance. Thus, both models support Hypothesis 6. This means that in Model 1, firms with CEOs reaching retirement age (60) or above and still in the job show better performance in terms of Tobin's Q than the other firms. Thus, an increase in CEO age improves firm performance, which could be attributed to a CEO's cumulative work experience in the insurance sector. In contrast, Peni (2014) finds CEO age to have a non-significant effect on Tobin's Q while having a positive significant effect on ROA.

Table 6. The effect of board composition and audit committee size regulation (DID-DID 2) on insurance performance.

	ROA				**ROE**				**Tobin's Q**			
	RE		**FE**		**RE**		**FE**		**RE**		**FE**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	−92.2933 (66.4366)	−67.9857 (65.4469)	26.9915 (120.9797)	−0.9747 (114.7766)	−142.0675 (281.4380)	−100.1930 (283.9532)	−377.8101 (589.2447)	−425.8992 (579.2212)	48.6276 ** (22.0616)	49.4751 ** (22.4167)	17.5573 (34.7025)	16.4818 (34.1703)
DID	3.8821 ** (1.5305)		3.0084 * (1.6810)		12.8994 * (7.2036)		11.6330 (8.1876)		0.7917 * (0.4641)		0.9705** (0.4822)	
DID 2		7.0552 *** (1.6080)		6.8950 *** (1.7449)		17.9074 ** (7.9955)		20.1698 ** (8.8054)		0.9933 ** (0.5038)		1.3653 *** (0.5195)
Ln(BS)	0.1098 (2.9148)	−1.6913 (2.9098)	−1.0057 (4.9194)	−4.6586 (4.6522)	1.1069 (11.1196)	−1.6003 (11.3074)	−0.3441 (23.9605)	−12.4160 (23.4774)	−0.8654 (0.9984)	−1.2404 (1.0200)	−0.5865 (1.4111)	−1.4933 (1.3850)
Ln(Assets)	2.3461 *** (0.5579)	2.1267 *** (0.5523)	3.5746 *** (1.1618)	3.2747 *** (1.1042)	9.9616 *** (2.0767)	9.2508 *** (2.0692)	21.6705 *** (5.6586)	20.6508 *** (5.5725)	−2.0213 *** (0.1970)	−2.0982 *** (0.2000)	−2.7714 *** (0.3333)	−2.8496 *** (0.3287)
$Ln(Firm^{Age})$	−0.1509 (1.7505)	−0.1958 (1.7408)	4.6909 (3.9975)	2.1213 (3.8002)	−7.1141 (6.3850)	−6.2605 (6.3942)	−11.9363 (19.4704)	−17.1877 (19.1778)	0.8497 (0.6260)	0.8433 (0.6377)	−0.3550 (1.1467)	−0.5640 (1.1314)
VOL	−0.0868 (0.0575)	−0.1018 * (0.0537)	−0.0769 (0.0601)	−0.0908 (0.0565)	0.0517 (0.2742)	−0.0113 (0.2660)	0.0837 (0.2929)	0.0262 (0.2851)	0.0551 *** (0.0173)	0.0508 *** (0.0168)	0.0546 *** (0.0173)	0.0496 *** (0.0168)
RiskRet	0.0064 (0.0258)	−0.0090 (0.0254)	0.0056 (0.0315)	−0.0092 (0.0300)	0.0238 (0.1110)	−0.0043 (0.1132)	0.0444 (0.1532)	0.0132 (0.1513)	0.0124 (0.0082)	0.0109 (0.0083)	0.0058 (0.0090)	0.0044 (0.0089)
DeInMarket	0.3865 (3.0514)	−3.6936 (3.1105)	1.7690 (3.2517)	−3.0050 (3.3867)	−2.4828 (14.8382)	−12.0066 (15.6670)	−4.2964 (15.8380)	−17.1251 (17.0911)	0.6236 (0.9138)	0.1067 (0.9715)	0.3983 (0.9327)	−0.3966 (1.0083)
Ln(gross written)	1.7765 (2.7892)	1.1826 (2.7246)	−4.5541 (5.0984)	−2.5247 (4.8761)	−2.5671 (11.8905)	−3.2911 (11.8585)	−1.7715 (24.8321)	2.8474 (24.6075)	−0.3520 (0.9233)	−0.2723 (0.9334)	1.6639 (1.4624)	1.8914 (1.4517)
Wald Chi^2	58.87 ***	75.52 ***			27.08 ***	28.56 ***			141.80 ***	139.39 ***		
F Statistic			6.12 ***	8.26 ***			2.15 **	2.61 **			11.75 ***	12.37 ***
R^2 (%)	32.66	36.41	25.93	32.02	17.41	18.26	16.53	17.23	63.02	62.66	58.55	57.75

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects, and FE is fixed effects. *DID* is difference-in-differences for board composition, and *DID 2* is difference-in-differences for audit size of committees, wherein *DID* and *DID 2* are *Treated*post regulation* (the treated group multiplied by post regulation). *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln(Firm^{Age})$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* is (risk retention) net premium written over gross premium written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by the total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

Table 7. The effect of CEO age on insurance performance.

	ROA				ROE				Tobin's Q			
	RE		FE		RE		FE		RE		FE	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant	−0.7497 (69.0916)	0.3980 (67.4842)	78.9727 (121.1916)	69.7052 (119.5041)	−144.1782 (203.8803)	−132.8353 (199.6423)	37.9489 (483.3050)	7.2923 (474.5818)	16.5741 (19.4919)	23.0009 (18.5765)	46.7401 (35.9342)	66.7694 * (35.3095)
	0.0061 (0.0762)		−0.0379 (0.0906)		0.0782 (0.2372)		−0.02715 (0.3612)		0.0382 * (0.0221)		0.0668 ** (0.0269)	
RET^{Age}		0.0056 (1.6876)		−0.1336 (1.8976)		−2.2552 (5.5483)		−8.3932 (7.5357)		1.2933 *** (0.4900)		1.5081 *** (0.5607)
Ln(BS)	3.1008 (3.4161)	3.0894 (3.4138)	6.8593 (4.8937)	7.1221 (4.8849)	1.2179 (9.6894)	1.8034 (9.6797)	5.8017 (19.5159)	3.0994 (19.3993)	−0.8896 (0.9653)	−0.9545 (0.9400)	−0.3361 (1.4510)	−0.3563 (1.4433)
Ln(Assets)	2.1032 *** (0.7463)	2.1075 *** (0.7514)	3.4949 *** (1.2209)	3.4890 *** (1.2220)	8.6833 *** (1.9353)	8.9523 *** (1.9597)	19.2644 *** (4.8689)	19.4303 *** (4.8528)	−2.1928 *** (0.2062)	−2.2256 *** (0.2012)	−2.9275 *** (0.3620)	−2.9431 *** (0.3611)
$Ln(Firm^{Age})$	6.6178 *** (1.8354)	6.6414 *** (1.8060)	10.6310 *** (3.4844)	10.4479 *** (3.4630)	0.3955 (4.8551)	0.8641 (4.7522)	10.6729 (13.8954)	10.0254 (13.7523)	0.3798 (0.5075)	0.4381 (0.4828)	1.0502 (1.0331)	1.4524 (1.0232)
VOL	0.0288 (0.0250)	0.0287 (0.0250)	0.0596 ** (0.0278)	0.0590 ** (0.0278)	0.0165 (0.0894)	0.0142 (0.0893)	0.0760 (0.1109)	0.0742 (0.1103)	0.0249 *** (0.0074)	0.0251 *** (0.0074)	0.0259 *** (0.0082)	0.0272 *** (0.0082)
RiskRet	0.0162 (0.0275)	0.0162 (0.0275)	−0.0028 (0.0314)	−0.0035 (0.0314)	0.0194 (0.0906)	0.0146 (0.0899)	−0.0036 (0.1253)	−0.0019 (0.1247)	0.0041 (0.0081)	0.0039 (0.0079)	0.0030 (0.0093)	0.0038 (0.0093)
DeInMarket	−0.5123 (3.2221)	−0.5089 (3.2321)	1.4249 (3.3729)	1.3702 (3.3964)	−1.4682 (12.4855)	−1.7319 (12.5155)	3.2804 (13.4511)	1.5406 (13.4878)	−0.3517 (0.9769)	−0.1599 (0.9774)	0.1209 (1.0001)	0.4781 (1.0035)
Ln(gross written)	−2.6260 (2.8249)	−2.6655 (2.7737)	−7.6756 (5.2023)	−7.3670 (5.1674)	−1.7478 (8.4277)	−2.3248 (8.2820)	−19.1279 (20.7465)	−17.6283 (20.5213)	1.2180 (0.7974)	1.0421 (0.7638)	0.3725 (1.5425)	−0.3678 (1.5268)
Wald Chi^2	51.50 ***	51.49 ***			25.56 ***	25.77 ***			136.66 ***	147.65 ***		
F Statistic			6.22 ***	6.20 ***			2.22 **	2.39 **			10.20 ***	10.39 ***
R^2 (%)	19.35	19.30	17.56	17.70	12.58	12.51	12.10	12.11	49.58	51.09	47.73	49.14

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects. FE is fixed effects. CEO^{Age} is the CEO age. RET^{Age} is the retirement age of CEOs. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln(Firm^{Age})$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* (risk retention) is net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

Table 8 shows significantly negative effects for CEO turnover on ROA and ROE under the RE model only. CEO turnover has a significantly negative effect on ROA (−2.3196) and ROE (−9.0104) at 5% significance in the RE model, while the effect on ROA (−1.8652) decreases in significance to 10% in the FE model. This means that, in the year the CEO is replaced, the firm experiences poor performance, which could be attributed to the new CEO's lack of knowledge in the first year. This result is consistent with that of Conyon and Florou (2002) and Al-Faryan (2017), who found that CEO changes convey a negative signal to investors and stock market participants. This results in negative equity returns for firms that are already underperforming relative to all listed firms. Other critical criteria that should be examined include whether the CEO is approaching retirement age, whether the CEO's departure is voluntary, and whether a new CEO has been already identified. Table 7 shows that the retirement age of the CEO has a strong impact on insurance firm performance. These results support Hypothesis 7.

Table 8. The effect of CEO turnover on insurance performance.

	ROA		**ROE**		**Tobin's Q**	
	RE	**FE**	**RE**	**FE**	**RE**	**FE**
Constant	0.4078 (65.4366)	73.4899 (118.4352)	−117.7657 (191.8118)	44.1000 (472.6367)	23.0344 (18.9582)	63.0219 * (35.9286)
CEO Turnover	−2.3196 ** (1.1207)	−1.8652 * (1.1298)	−9.0104 ** (4.2328)	−6.8692 (4.5089)	−0.3170 (0.3435)	−0.3390 (0.3428)
Ln(BS)	3.0732 (3.3161)	7.1657 (4.8010)	2.1923 (9.0368)	6.0125 (19.1594)	−0.8609 (0.9599)	−0.8823 (1.4564)
Ln(Assets)	1.9658 *** (0.7158)	3.5251 *** (1.2118)	7.9865 *** (1.7723)	19.4013 *** (4.8357)	−2.1519 *** (0.2032)	−2.9052 *** (0.3676)
$Ln(Firm^{Age})$	6.4874 *** (1.7346)	10.4865 *** (3.4332)	0.9294 (4.4112)	10.6595 (13.7006)	0.5375 (0.4930)	1.3641 (1.0415)
VOL	0.0306 (0.0249)	0.0619 ** (0.0276)	0.0276 (0.0885)	0.0864 (0.1102)	0.0254 *** (0.0075)	0.0275 *** (0.0084)
RiskRet	0.0172 (0.0271)	−0.0018 (0.0311)	0.0121 (0.0864)	0.0023 (0.1243)	0.0033 (0.0081)	0.0045 (0.0094)
DeInMarket	−0.6451 (3.2121)	1.3658 (3.3469)	−1.7487 (12.5175)	3.1437 (13.3565)	−0.3433 (0.9868)	0.1632 (1.0153)
Ln(gross written)	−2.5134 (2.6886)	−7.5518 (5.1186)	−2.1348 (7.9806)	−19.5263 (20.4268)	0.9846 (0.7792)	−0.1653 (1.5528)
Wald Chi^2	56.62 ***		33.00 ***		135.91 ***	
F Statistic		6.64 ***		2.54 **		9.27 ***
R^2 (%)	21.54	19.05	14.51	13.16	49.72	48.40

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects. FE is fixed effects. *CEO Turnover* is a dependent dummy variable that takes 1 if the CEO changed, and 0 otherwise. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln(Firm^{Age})$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* (risk retention) is net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

Looking at the results of Model 1, Table 9 shows that the director incentives and CEO and top executive pay have a significantly positive relationship with Tobin's Q in the RE model (3.75e-07 and 1.37e-07, respectively) at 5% significance and the CEO and top executive pay in the FE model (1.07e-07), with decreasing significance at 10%. These results support Hypotheses 8 and 9. Our findings also align with those of Al-Faryan (2021), who found that managerial pay has a positive and significant effect on Tobin's Q.

Table 9. The effect of managerial pay on insurance performance.

	ROA				ROE				Tobin's Q			
	RE		FE		RE		FE		RE		FE	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	−0.9302 (70.2888)	−12.3938 (69.8774)	74.2481 (120.4338)	64.0658 (119.1055)	−106.2319 (211.9266)	−115.4812 (208.8970)	11.2629 (478.7733)	33.7276 (478.8131)	36.9417 ** (18.6380)	27.8411 (18.2432)	59.1962 * (35.6815)	61.3998 * (35.9382)
D-INC	−5.97e−08 (5.08e−07)		−1.93e−07 (5.41e−07)		−1.24e−06 (1.78e−06)		−2.04e−06 (2.15e−06)		3.75e−07 ** (1.48e−07)		2.61e−07 (1.60e−07)	
CEO-Ex-Pay	−7.32e−08 (1.86e−07)		−1.65e−07 (2.05e−07)		3.60e−07 (6.48e−07)		2.64e−07 (8.13e−07)		1.37e−07 ** (5.41e−08)		1.07e−07 * (6.06e−08)	
Above mean D-INC		0.7280 (1.2329)		0.3208 (1.3726)		0.9535 (4.1159)		−4.5717 (5.5180)		1.0920 *** (0.3532)		0.5355 (0.4142)
Above mean CEO-Ex-Pay		−2.3338 * (1.2980)		−2.8441 ** (1.4166)		−1.1613 (4.5487)		−1.3268 (5.6950)		0.2337 (0.3825)		−0.3697 (0.4275)
CEO-Shares (%)	0.0587 (0.1161)	0.0572 (0.1131)	0.0440 (0.1195)	0.0413 (0.1167)	0.2446 (0.4302)	0.3216 (0.4194)	0.1722 (0.4749)	0.2398 (0.4691)	−0.0076 (0.0348)	0.0004 (0.0346)	−0.0176 (0.0354)	−0.0151 (0.0352)
CEO-Ten	0.1132 (0.3387)	0.1833 (0.3304)	−0.1055 (0.3626)	−0.0459 (0.3534)	0.3250 (1.1693)	0.5113 (1.1480)	−1.1042 (1.4413)	−0.9594 (1.4208)	−0.0082 (0.0983)	0.0413 (0.0971)	0.0859 (0.1074)	0.1586 (0.1066)
Ln(BS)	3.5406 (3.5847)	2.9395 (3.5002)	8.0985 (4.9747)	8.0019* (4.8587)	2.3566 (10.2264)	0.4885 (10.0479)	7.3184 (19.7764)	8.3767 (19.5324)	−1.6436* (0.9380)	−1.2638 (0.9024)	−1.5823 (1.4739)	−0.9798 (1.4660)
Ln(Assets)	2.1615 *** (0.8060)	2.3894 *** (0.8004)	3.6980 *** (1.2499)	3.8714 *** (1.2415)	8.2415 *** (2.1975)	8.4487 *** (2.1427)	19.8919 *** (4.9688)	20.2076 *** (4.9908)	−2.3514 *** (0.2052)	−2.1782 *** (0.1967)	−3.0796 *** (0.3703)	−2.9776 *** (0.3746)
$Ln\left(Firm^{Age}\right)$	6.7396 *** (1.8949)	6.3939 *** (1.8986)	11.4721 *** (3.6472)	11.0515 *** (3.5675)	0.8064 (4.9248)	0.1848 (4.9017)	12.6826 (14.4990)	14.4660 (14.3417)	0.3028 (0.4688)	0.2588 (0.4546)	0.5365 (1.0806)	0.9458 (1.0764)
VOL	0.0293 (0.0254)	0.0245 (0.0252)	0.0577 ** (0.0281)	0.0501 * (0.0282)	0.0243 (0.0907)	0.0150 (0.0904)	0.0847 (0.1115)	0.0848 (0.1133)	0.0274 *** (0.0074)	0.0245 *** (0.0075)	0.0276 *** (0.0083)	0.0243 *** (0.0085)
RiskRet	0.0156 (0.0282)	0.0183 (0.0279)	0.0004 (0.0320)	0.0062 (0.0317)	0.0062 (0.0924)	0.0082 (0.0918)	−0.0058 (0.1272)	0.0013 (0.1276)	−0.0009 (0.0080)	0.0001 (0.0079)	0.0012 (0.0095)	0.0049 (0.0096)
DeInMarket	−0.4018 (3.2736)	−0.7778 (3.2316)	1.3615 (3.4154)	0.9960 (3.3867)	−0.3084 (12.6859)	−0.4782 (12.6820)	3.3509 (13.5775)	4.1902 (13.6148)	0.0771 (0.9970)	−0.2958 (1.0166)	0.2574 (1.0119)	0.0112 (1.0219)
Ln(gross written)	−2.7008 (2.8524)	−2.3186 (2.8453)	−7.8392 (5.2223)	−7.5226 (5.1547)	−3.0357 (8.5717)	−2.5968 (8.5204)	−18.6782 (20.7608)	−20.0951 (20.7223)	0.5933 (0.7521)	0.8325 (0.7411)	0.2136 (1.5472)	−0.0212 (1.5553)
Wald Chi^2	51.44 ***	55.79 ***			26.23 ***	26.36 ***			164.53 ***	170.05 ***		
F Statistic			4.55 ***	4.95 ***			1.78 *	1.75 *			7.45 ***	7.08 ***
R^2 (%)	19.51	20.21	17.01	17.71	13.34	13.10	12.14	11.53	53.41	53.61	51.56	49.57

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects. FE is fixed effects. *D-INC* is director incentives. *CEO-Ex-Pay* is the CEO and top executive pay. *Above mean D-INC* and *Above mean CEO-Ex-Pay* are dependent dummy variables of director incentives and CEO and top executive pay, respectively, that take 1 if above the mean. *CEO-Shares(%)* is the percentage of CEO-owned shares. *CEO-Ten* is CEO tenure. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln\left(Firm^{Age}\right)$ is the natural logarithm of firm age. VOL is volatility. *RiskRet* (risk retention) is net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

Model 2 uses the above-the-mean director incentives and above-the-mean CEO and top-executive-pay dummy variables equal to 1 if above the mean, and 0 otherwise (see Table 1 regarding the mean). We find that above-the-mean CEO and top executive pay has a significantly negative effect on ROA in the RE (−2.3338) and FE (−2.8441) models at 10% and 5% significance, respectively. Thus, for above the mean, Hypothesis 9 is not supported. However, above-the-mean director incentives have a significantly positive effect on Tobin's Q in the RE (1.0920) model at 1% significance. Thus, Hypothesis 8 is supported by Model 1.

In sum, an increase in director incentives and CEO and top executive pay and above-the-mean director incentives leads to better performance in terms of Tobin's Q. However, director incentives, CEO and top executive pay, and above-the-mean director incentives do not affect the accounting performance indicators ROA and ROE. As accounting performance indicators should capture the effects of above-the-mean CEO and top executive pay, the results imply that insurance firms that pay their CEO and top executives above the mean have worse firm performance (ROA) than firms that pay less than the market average. In conclusion, the director incentives have a positive effect on insurance performance, as do CEO and top executives pay up to the mean, after which the performance effect turns negative.

One reason insurance firms may lose value is that they are overpaying their CEOs and executives, which results in poor performance as these CEOs and top executives seek self-benefits instead of shareholder benefits. Other reasons can be noted in the standard deviation of CEO and top executive pay. Larger pay indicates that CEO and top executive data are more dispersed, while director incentives show that more director incentive data are clustered about the mean, as seen in Table 1.

5.1. Probit Model Average Marginal Effect Results

We also use the probit model average marginal effect, as explained in the methodology section. Table 10 shows the results of the probit model we use to capture the likelihood of CEO turnover due to poor performance. The estimated regressions show a significant and negative relationship between the two accounting operating performance indicators, ROA (−0.0320) and ROE (−0.0074) and CEO turnover at 5% significance and vice versa (Table 8). These results support Hypothesis 7. This means that a firm with better performance is less likely to change CEOs than a firm with bad performance is. Thus, firms with poor performance have a higher probability of changing CEOs. CEO turnover is a critical variable that captures when CEOs are replaced due to poor performance. Many studies have shown an inverse effect between firm performance and CEO turnover (Conyon and Florou 2002; Coughlan and Schmidt 1985; Jenter and Kanaan 2015). Volpin (2002) and Gibson (2003) argue that there is a greater likelihood of CEO turnover at firms with strong governance systems and that the likelihood of CEO turnover increases with poor firm performance.

Table 10. The effect of insurance performance on CEO turnover.

	ROA	**ROE**	**Tobin's Q**
Performance	−0.0320 **	−0.0074 **	−0.0318
	(0.0129)	(0.0036)	(0.0432)
Ln(BS)	0.4790	0.4253	0.3715
	(0.5098)	(0.5035)	(0.4948)
Ln(Assets)	−0.1584	−0.1415	−0.2746 **
	(0.1007)	(0.1038)	(0.1317)
$Ln(Firm^{Age})$	0.3556	0.1759	0.1735
	(0.2617)	(0.2541)	(0.2595)
VOL	0.0062	0.0061	0.0069
	(0.0051)	(0.0052)	(0.0056)
RiskRet	−0.0024	−0.0032	−0.0029
	(0.0048)	(0.0047)	(0.0047)

Table 10. *Cont.*

	ROA	ROE	Tobin's Q
DeInMarket	−0.0708	−0.0196	−0.0479
	(0.7062)	(0.6999)	(0.7011)
Ln(gross written)	−0.0726	−0.0461	0.0470
	(0.4414)	(0.4461)	(0.4601)
Likelihood ratio	14.55 *	12.36	8.74

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. This table presents the average marginal effects from the probit estimation, wherein CEO turnover is the dependent variable. ROA, ROE, and Tobin's Q are performance measures. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln\left(Firm^{Age}\right)$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* (risk retention) is net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

Table 11 presents our findings that show a significantly positive relationship between insurance performance and above-the-mean director incentives. We find that Tobin's Q has a significantly positive effect on above-the-mean director incentives (0.1867) at 5% significance and vice versa (Table 9). Once again, these findings support Hypothesis 8. Board members can receive incentives of up to 10% of a company's net profits based on good management performance. This can motivate strong firm performance. However, we do not find a significant relationship between above-the-mean CEO and top executive pay and above-the-mean director incentives.

Table 11. The effect of insurance performance on above-the-mean director incentives.

	ROA	ROE	Tobin's Q
Performance	0.0141	−0.0017	0.1867 **
	(0.0197)	(0.0052)	(0.0745)
Above mean CEO-Ex-Pay	−0.0138	−0.0186	−0.0571
	(0.3593)	(0.3568)	(0.3630)
CEO-Shares (%)	0.0067	0.0073	0.0076
	(0.0753)	(0.0751)	(0.0776)
CEO-Ten	0.0589	0.0643	0.0369
	(0.0954)	(0.0952)	(0.0952)
Ln(BS)	1.9720 *	2.0964 *	2.2934 **
	(1.1154)	(1.1001)	(1.0835)
Ln(Assets)	0.3151	0.3652	0.8320 **
	0.2569	(0.2598)	(0.3251)
$Ln(Firm^{Age})$	0.9510	1.0234	0.8383
	(0.6359)	(0.6282)	(0.6106)
VOL	0.0073	0.0074	0.0027
	(0.0075)	(0.0074)	(0.0077)
RiskRet	0.0108	0.0101	0.0114
	(0.0084)	(0.0083)	(0.0084)
DeInMarket	0.3329	0.2307	0.2778
	(0.9247)	(0.9222)	(0.9197)
Ln(gross written)	0.5871	0.5823	0.6802
	(0.9539)	(0.9546)	(0.9410)
Likelihood ratio	39.87 ***	39.44 ***	46.13 ***

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. This table presents the average marginal effects from the probit estimation, wherein above-the-mean director incentives is the dependent dummy variable that takes 1 if above the mean, and 0 otherwise. ROA, ROE, and Tobin's Q are performance measures, *Above mean CEO-Ex-Pay* is a dependent dummy variable that takes 1 if above the mean, and 0 otherwise. *CEO-Shares (%)* is the percentage of CEO-owned shares. *CEO-Ten* is CEO tenure. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln\left(Firm^{Age}\right)$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* (risk retention) is net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

Table 12 presents findings that show a significantly negative relationship between poor insurance performance and above-the-mean CEO and top executive pay. We find that ROA has a significantly negative effect on above-the-mean CEO and top executive pay (−0.0359) at 5% significance and vice versa (Table 9), thereby rejecting Hypothesis 9 in terms of above the mean. Poor performance at insurance firms increases when CEOs and top executives are paid above the mean. One explanation for increases in CEO and top executive pay may be due to high insurance administrative costs in addition to the increasing importance of accounting operating performance indicators such as ROA, along with increasing competition, and the desire to raise insurance CEO and top executive pay to be on par with or even higher than that of banks. This issue requires control of technical performance and job attractiveness, along with the monitoring of wages and petty cash, compensation, and competency development. However, CEOs and top executives may exploit internal information to achieve personal gain. There may be a lack of accountability for high managerial pay, even with poor performance. Thus, insurance companies will lose capital due to weak management, weak governance, and gaps in the application of corporate governance regulation and the corporate governance code.

Table 12. The effect of insurance performance on above the mean CEO and top executive pay.

	ROA	**ROE**	**Tobin's Q**
Performance	−0.0359 **	−0.0036	0.0387
	(0.0183)	(0.0049)	(0.0755)
Above mean D-INC	0.0474	−0.0416	−0.0764
	(0.3315)	(0.3219)	(0.3254)
CEO-Shares (%)	0.0322	0.0330	0.0322
	(0.1236)	0.1181	(0.1166)
CEO-Ten	0.2898 ***	0.2604 ***	0.2540 **
	(0.1051)	(0.1006)	(0.0990)
Ln(BS)	0.0465	−0.0919	−0.0749
	(0.9475)	(0.9042)	(0.8886)
Ln(Assets)	0.7354 ***	0.6837 ***	0.7170 ***
	(0.2251)	(0.2187)	(0.2553)
$Ln(Firm^{Age})$	−0.0063	−0.1993	−0.2002
	(0.5243)	(0.4854)	(0.4738)
VOL	−0.0253	−0.0244	−0.0272
	(0.0169)	(0.0166)	0.0169
RiskRet	0.0078	0.0066	0.0065
	(0.0080)	(0.0077)	0.0076
DeInMarket	−1.4224	−1.3156	−1.2592
	(0.9562)	(0.9359)	0.9267
Ln(gross written)	0.9580	1.1193	1.0534
	(0.8161)	(0.7734)	0.7681
Likelihood ratio	52.83 ***	49.39 ***	49.12 ***

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. This table presents the average marginal effects from the probit estimation, wherein above-the-mean CEO and top executive pay is the dependent dummy variable of the CEO and top executive pay, which takes 1 if above the mean, and 0 otherwise. ROA, ROE, and Tobin's Q are performance measures, *Above mean D-INC* is a dependent dummy variable of director incentives, which takes 1 if above the mean, and 0 otherwise. *CEO-Shares (%)* is the percentage of CEO-owned shares. *CEO-Ten* is CEO tenure. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln(Firm^{Age})$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* (risk retention) is net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

The results shown in Tables 8–12 reflect the fact that Saudi insurance companies have gone bankrupt due to a lack of compliance with regulatory requirements, high administrative costs, and weak management (Alokla et al. 2022). A policy of inheritance has been widespread across high positions in these firms to keep decision-making in the hands of a few and to retain high salaries, even if those holding these high positions lack

expertise. This has led to failure in the management of Saudi insurance companies; these are still suffering from their losses. In one case, the reason for the firm's loss was because it appointed an ineffective CEO who had been dismissed from another company. CEO turnover such as this can lead to the dismissal of current employees who are then replaced by favourites, with these positions redistributed. The redistribution of power among employees in these companies, for example, through the appointment of a general manager and an executive director or someone in another leadership position, occurs through bias, with the focus on the development of certain employees over others. In these cases, the CEO focuses on one person by offering promotion, workshops, courses, and certificates to prepare them for an administrative position.

Poor management or functional exploitation through resignation or dismissal occurs without anyone held accountable or even demanding monies that may have been taken without right. In such cases, the biggest losers are small shareholders who eagerly await the return on their shares and poor employees who have no union to protect their rights. In these firms, there are no profits to distribute or revenue increases, and there may be collusion in administrative affairs. This scenario may be repeated with subsequent CEOs and top executives, and the result is likely the closure of the company. When this occurs, the shares evaporate, and large shareholders escape by selling their shares. The management of the firm's investments is assigned by the CEO and the financial or investment portfolio official, and the individuals in these roles may not have sufficient experience to accomplish this effectively.

5.2. Shariah Compliance and Life Insurance Firm Results

We examined seven publicly listed Shariah-compliant firms in our timeframe, providing 36 observations to investigate the relationships between Shariah-compliant insurance firm performance and board composition and audit committee size. All of the firms follow the regulations of corporate governance, except for one, with one observation of the audit committee and board composition. Because the firms are compliant with Shariah and corporate governance regulations, the exogenous shock of regulation in terms of audit committee and board composition will not have an impact, as they already complied. Although the sample is small, at a rate of 97%, the results imply that Shariah-compliant firms are more committed to implementing corporate governance regulations. These findings are consistent with those in a study by Ezzine (2018).

Bhatti and Bhatti (2010) argue that Islamic corporate governance has the same goals as conventional corporate governance but operates within the framework of Islam's religiously based moral precepts. Hasan (2009) contrasts Western and Islamic corporate governance. To begin, Islamic corporate governance is governed by Islamic law, or Shariah, which encompasses all facets of life. In addition, the impact of Shariah law and certain Islamic economic and financial concepts as they relate to corporate activities and policies should be considered. This means that, in contrast to other systems of corporate governance, Islamic corporate governance's ultimate purpose is Shariah compliance. Thus, Shariah-compliant insurance firms are concerned with adhering to Islamic Shariah provisions in all transactions, operations, and investment activities. In terms of corporate governance, all factors, such as board composition and audit committee size, must be compatible with Shariah compliance. In this context, we conduct an analysis to determine the governance impact of board composition and audit committee size on Shariah-compliant insurance firm performance in Saudi Arabia.

Table 13 shows the results of Model 1. Of the listed Saudi insurance firms that are Shariah compliant, for board composition, the performance measures of ROA in the RE (−0.1305) and FE (−0.3452) models, ROE in the RE (−0.2492) model but not the FE model, and Tobin's Q (RE and FE) are significantly negative, at 1% significance for ROA and ROE (RE). This result aligns with the results in Table 3, which indicate that board composition is significantly negatively correlated with performance for all insurance firms. Thus, these findings do not support Hypothesis 1.

Table 13. The effect of board composition and audit committee size on performance in Shariah-compliant insurance firms.

	ROA				**ROE**				**Tobin's Q**			
	RE		**FE**		**RE**		**FE**		**RE**		**FE**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	−24.1626 (64.7476)	−15.1048 (64.9679)	77.2051 (117.3777)	98.1568 (120.2730)	−186.7492 (195.8050)	−169.6112 (196.2174)	47.7447 (473.3621)	90.2536 (481.5170)	24.5880 (19.1016)	24.9281 (18.9105)	63.4746 * (35.8875)	58.7432 (36.4777)
*%IB * Shariah-compliant*	−0.1305 *** (0.0471)		−0.3452 *** (0.1427)		−0.2492 *** (0.1176)		−0.7841 (0.5754)		0.0110 (0.0135)		−0.0519 (0.0436)	
*SAC * Shariah-compliant*		−1.5274 ** (0.6468)		−3.9037 (2.7331)		−2.9509 * (1.5868)		−8.1604 (10.9422)		0.2700 (0.1806)		0.5092 (0.8289)
Ln(BS)	2.7418 (3.2585)	2.7593 (3.2818)	7.6204 (4.7611)	6.9556 (4.8131)	1.8371 (9.2344)	1.9703 (9.3146)	7.0495 (19.2004)	5.5780 (19.2693)	−0.8860 (0.9595)	−0.8851 (0.9532)	−0.8138 (1.4557)	−0.8539 (1.4598)
Ln(Assets)	2.0529 *** (0.6991)	2.0242 *** (0.7048)	3.3900 *** (1.2012)	3.2670 *** (1.2236)	8.6788 *** (1.8067)	8.6608 *** (1.8246)	19.0395 *** (4.8441)	18.7999 *** (4.8989)	−2.1390 *** (0.2026)	−2.1316 *** (0.2010)	−2.9267 *** (0.3673)	−2.8836 *** (0.3711)
$Ln(Firm^{Age})$	5.8467 *** (1.7087)	6.0032 *** (1.7198)	11.1440 *** (3.4138)	11.2824 *** (3.4884)	−0.8654 (4.5685)	−0.5353 (4.5995)	12.1101 (13.7670)	12.2748 (13.9657)	0.5805 (0.4965)	0.6064 (0.4919)	1.4620 (1.0437)	1.2508 (1.0580)
VOL	0.0205 (0.0247)	0.0223 (0.0248)	0.0595 ** (0.0273)	0.0610 ** (0.0276)	−0.0035 (0.0885)	0.0011 (0.0886)	0.0766 (0.1101)	0.0798 (0.1107)	0.0253*** (0.0075)	0.0255 *** (0.0075)	0.0270 *** (0.0083)	0.0267 *** (0.0084)
RiskRet	0.0237 (0.0269)	0.02333 (0.0270)	−0.0056 (0.0309)	−0.0018 (0.0312)	0.0417 (0.0881)	0.0390 (0.0886)	−0.0088 (0.1245)	−0.0004 (0.1250)	0.0029 (0.0081)	0.0023 (0.0081)	0.0039 (0.0094)	0.0040 (0.0095)
DeInMarket	−0.9860 (3.1998)	−0.8470 (3.2122)	1.3130 (3.3166)	1.5695 (3.3558)	−2.1544 (12.4531)	−1.9154 (12.4659)	3.0688 (13.3753)	3.6203 (13.4351)	−0.3116 (0.9880)	−0.3067 (0.9851)	0.1562 (1.0140)	0.1465 (1.0178)
Ln(gross written)	−1.4551 (2.6647)	−1.8358 (2.6730)	−7.5831 (5.0718)	−8.3519 (5.1723)	0.3023 (8.1421)	−0.4524 (8.1546)	−19.3657 (20.4535)	−20.9374 (20.7074)	0.9013 (0.7864)	0.8773 (0.7783)	−0.1649 (1.5507)	−0.0096 (1.5687)
Wald Chi^2	60.76 ***	58.16 ***			31.95 ***	30.54 ***			135.70 ***	139.00 ***		
F Statistic			7.14 ***	6.53 ***			2.47 **	2.29 **			9.35 ***	9.16 ***
R^2 (%)	25.46	24.52	22.54	22.07	14.62	14.20	13.53	13.31	49.96	50.30	42.52	49.07

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects. FE is fixed effects. *%IB* is the board composition. *SAC* is the size of the audit committee. *Shariah-compliant* is a dummy variable that equals 1 if the firm is Shariah compliant in all of its transactions, insurance operations, and investment activities, and 0 otherwise. *%IB*Shariah-compliant* is board composition multiplied by the Shariah-compliant variable. *SAC* Shariah-compliant* is the size of the audit committee multiplied by Shariah-compliant variable to measure Islamic corporate governance or the corporate governance of Shariah-compliant insurance firms. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln(Firm^{Age})$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* is (risk retention) net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

In Model 2, we find that Shariah compliance and the size of the audit committee (SAC) is significantly negatively correlated with insurance firm performance. The measures of the RE under the ROA (−1.5274) and the ROE (−2.9509) models are significant at 5% and 10%, except under Tobin's Q models. Thus, Hypothesis 4 is not supported, similar to the results in Table 5. It is clear that firms providing Islamic insurance are similar to all other Saudi insurance firms, which operate for the same reasons as those mentioned in Tables 3 and 4 with a few exceptions.

However, independent boards and audit committees have little experience with Islamic finance and insurance. The current legislative environment is inconsistent with the logic underlying Islamic insurance companies. This is because of the rapid rise to prominence in the stock market of Islamic insurance. Islamic insurance is based on the principle that those who are insured own the insurance company; those in charge of its management do not own it but instead receive fixed salaries or a percentage of the profits earned by the company in exchange for managing it. The excess of the company's assets is distributed to the insured.

For robustness, we also examine 16 firms providing life insurance between 2008 and 2014, providing 90 observations to investigate the relationship between these firms in terms of board composition and audit committee size on firm performance. All of the firms, with the exception of two, follow corporate governance regulations based on one observation of board composition and two observations of audit committee size. Because life insurance firms already follow corporate governance regulations, the exogenous shock of the regulation of board composition and audit committee size will not have an impact. As before, based on this sample, it appears that firms that provide life insurance are more committed to implementing corporate governance regulations, at a rate of 97.8% for the audit committee and 98.9% for board composition. These findings are consistent with Table 13.

Table 14 indicates that life insurance firms are distinguished by board composition and audit committee size, which have distinct characteristics. First, unlike many non-life insurance companies, the independent board of directors and audit committee comprise highly competent financial professionals. Second, the time and effort spent monitoring and disciplining a corporation may benefit the whole customer base. Finally, since, in general, life insurance is a long-term investment, individual policyholders may purchase it only once. As a result, it is necessary to maintain the customer base at all times as this has an impact on firm performance. In this context, we examine whether listed Saudi firms that provide life insurance have similar results to all listed insurance firms.

We find that board composition at these life insurance firms is significantly negative for the RE Model 1 under the ROA (−0.0570) and under the ROE (−0.1469), and the FE Model 1 under Tobin's Q (−0.0312), with significance at 10%. Thus, Hypothesis 1 is not supported, similar to our results in Tables 3 and 13.

In Model 2, we find that the SAC is significantly negative with life insurance firm performance at 10% and 5% significance by measures of the RE in the ROA (−0.8617) and the ROE (−2.4960) models but not in the FE models. Thus, Hypothesis 4 is not supported, a result similar to that in Tables 5 and 13. However, the SAC has a significantly positive effect on Tobin's Q in the RE (0.3137) model at 5% significance, which supports Hypothesis 4. Thus, the findings are consistent with Tobin's Q with *Asize*(4) and under the RE (1.5592), as they relate positively with Tobin's Q at 10% significance, as shown in Table 5.

In sum, board composition and audit committee size in life insurance firms reflect similar patterns as all insurance firms, wherein medical and motor insurance make up 84% of the total Saudi insurance market, as these are mandatory. Notably, life insurance is almost non-existent in Saudi Arabia (due to cultural and religious reasons, among other factors, such as the lack of awareness). However, with the implementation of the Saudi Vision 2030, the market will become officially regulated and more developed. As this development occurs, the spread of conventional and takaful life insurance products is expected to rise.[1]

Table 14. The effect of board composition and audit committee size on performance of firms providing life insurance.

	ROA				**ROE**				**Tobin's Q**			
	RE		**FE**		**RE**		**FE**		**RE**		**FE**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	−13.5532 (66.6831)	−8.5681 (66.4946)	64.7072 (119.4495)	78.0837 (120.7469)	−181.8415 (196.9191)	−169.1073 (195.8273)	53.2379 (476.1041)	85.8705 (480.7785)	23.9459 (18.6537)	23.9584 (18.3406)	58.0626 (35.7207)	55.9978 (36.3181)
%IB Life insurance*	−0.0570 * (0.0318)		−0.0387 (0.0551)		−0.1469 * (0.0809)		0.1556 (0.2195)		0.0119 (0.0085)		−0.0312 * (0.0165)	
SAC Life insurance*		−0.8617 * (0.5111)		0.5321 (1.2353)		−2.4960 ** (1.2322)		3.6147 (4.9185)		0.3137 ** (0.1315)		−0.4266 (0.3715)
Ln(BS)	3.1701 (3.3582)	3.0200 (3.3588)	7.4156 (4.8457)	7.0817 (4.8416)	1.7650 (9.2895)	1.7598 (9.3061)	5.0301 (19.3140)	5.4324 (19.2777)	−0.9037 (0.9345)	−0.8892 (0.9219)	−0.6826 (1.4491)	−0.8120 (1.4562)
Ln(Assets)	2.3556 *** (0.7427)	2.3609 *** (0.7457)	3.5017 *** (1.2198)	3.5013 *** (1.2212)	9.5891 *** (1.8949)	9.7646 *** (1.9066)	19.1962 *** (4.8618)	19.3601 *** (4.8624)	−2.1705 *** (0.2006)	−2.2180 *** (0.1984)	−2.8998 *** (0.3648)	−2.9243 *** (0.3673)
$Ln(Firm^{Age})$	6.7912 *** (1.7699)	6.7423 *** (1.7694)	10.6575 *** (3.4678)	10.5179 *** (3.4620)	0.9460 (4.5519)	1.1247 (4.5659)	9.7379 (13.8219)	10.9670 (13.7849)	0.4644 (0.4765)	0.4348 (0.4695)	1.5209 (1.0370)	1.3091 (1.0413)
VOL	0.0285 (0.0249)	0.0266 (0.0249)	0.0610 ** (0.0279)	0.0586 ** (0.0278)	0.0115 (0.0884)	0.0083 (0.0883)	0.0673 (0.1112)	0.0727 (0.1106)	0.0247 *** (0.0075)	0.0252 *** (0.0074)	0.0286 *** (0.0083)	0.0273 *** (0.0084)
RiskRet	0.0135 (0.0273)	0.0088 (0.0276)	−0.0044 (0.0314)	0.0006 (0.0328)	−0.0018 (0.0885)	−0.0151 (0.0893)	−0.0003 (0.1250)	0.0236 (0.1305)	0.0044 (0.0080)	0.0067 (0.0080)	0.0034 (0.0094)	0.0009 (0.0099)
DeInMarket	−0.7381 (3.2096)	−0.7244 (3.2125)	1.2974 (3.3721)	1.5553 (3.3920)	−1.9786 (12.4794)	−1.9069 (12.4428)	3.6639 (13.4406)	4.3323 (13.5060)	−0.3319 (0.9956)	−0.3182 (0.9884)	0.0881 (1.0084)	0.0425 (1.0202)
Ln(gross written)	−2.2330 (2.7315)	−2.4142 (2.7278)	−7.1715 (5.1608)	−7.7811 (5.2366)	−0.6160 (8.1395)	−1.2495 (8.1079)	−19.7904 (20.5700)	−21.5943 (20.8508)	0.9538 (0.7642)	0.9771 (0.7528)	0.0388 (1.5433)	0.1800 (1.5751)
Wald Chi^2	55.37 ***	54.94 ***			30.47 ***	31.22 ***			143.95 ***	151.43 ***		
F Statistic			6.27 ***	6.23 ***			2.29 **	2.29 **			9.74 ***	9.33 ***
R^2 (%)	22.28	22.70	19.32	15.81	14.16	14.52	10.67	9.65	50.95	52.18	42.66	42.70

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. ROA, ROE, and Tobin's Q are performance measures. RE is random effects. FE is fixed effects. *%IB* is board composition. *SAC* is the size of the audit committee. *Life insurance* is a dummy variable that equals 1 if the firm has life insurance contracts, and 0 otherwise. *%IB* Life insurance* is board composition multiplied by the life insurance firm variable. *SAC* Life insurance* is the size of the audit committee multiplied by the life insurance firm variable. *Ln(BS)* is the natural logarithm of the board size. *Ln(Assets)* is the natural logarithm of firm assets. $Ln(Firm^{Age})$ is the natural logarithm of firm age. *VOL* is volatility. *RiskRet* is (risk retention) net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance.

5.3. The Impact of Saudi Inflation and the Consumer Price Index on Insurance

Prior studies have noted the importance of the great interplay between fiscal and monetary policy and suggest that both policies behave differently to the economic cycle. However, the impact of further fiscal consolidation efforts on domestic demand was also observed in the KSA and in some countries of the Eurozone (Cecrdlova (2021) and Albassam (2021)). Correspondingly, it is worth mentioning that the discrepancy between fiscal and monetary policy plays a significant role in developing and maintaining the economics. These developments can not be achieved without reforming the existing economic and financial policies (Cecrdlova (2021) and Albassam (2021)).

Saudi Arabia's purchasing power remained strong over our seven-year timeframe. From 2008 to 2014, the purchasing power of the currency improved for two reasons. First, inflation decreased from 9.87% in 2008 to 2.24% in 2014 (see Appendix A). Second, the Saudi riyal is pegged to the US dollar at a rate of 3.75 (Al-Faryan 2021), and insurance policies are indexed to the consumer price index.

We investigate whether this impacted the results of the inflation rate on insurance performance. Appendix B shows that the inflation rate (%) has a significant negative effect on insurance performance at 1% for ROA and Tobin's Q, while ROE has a significant negative effect at 5% significance. This indicates that the higher the inflation rate, the lower the insurance company profits. There are two major interpretations of this result. First, inflation has a negative impact on insurance performance because it leads to a decline in the real income of individuals due to the purchasing power of their money. Demand for insurance policies to insure cars, real estate, and so on is directly proportional to individual income and vice versa. The less real income an individual has, the less he/she spends on insurance. Second, inflation will lead to a rise in the cost of the partial compensation settlement, as that cost rises as a result of the price increase. This problem is addressed in property insurance policies by increasing the amount of insurance in the same inflation line by re-evaluating the value of the property insured. The proportionality clause in compensation is also partially applied in the event that the insured sum is less than the market value of the property. While reinsurance agreements address the impact of inflation on the settlement of claims by setting a cost-of-living index clause or stabilisation clause so that the reinsurer does not bear the increase in the value of compensation resulting from inflation, this condition is usually included in excess loss treaties. In particular, with regard to the insurance of civil liability and motor vehicles, the effect of this condition is that, if the compensation is settled at a time when the value of the cash differs significantly from its value on a specific date (usually the date of commencement of the agreement), the division of compensation between the assigned company and the reinsurer takes place on the basis of the ratios that the value of that compensation would have been divided by had it been settled on that particular date on the basis of the terms of the agreement.

6. Conclusions

Our principal objective is to investigate whether corporate governance factors have an effect on financial performance in Saudi insurance firms. Specifically, we examine how board composition, director incentives, board independence, monitoring costs, audit committee size, CEO and top executive pay, CEO age, and CEO turnover influence financial performance by looking at 35 insurance firms listed on the Saudi stock market from 2008 to 2014.

Based on the literature, we consider the endogeneity of the statistical approach and discover in the RE and FE models that board composition has a significant negative relationship with ROE and Tobin's Q, except in the RE model. However, audit committee size does not have a significant relationship with performance, using the DID and DID2 approaches for Saudi insurance companies that choose to comply with regulations. The evidence indicates that firm performance is positively affected by information asymmetry, which increases monitoring costs for independent directors and also reduces the positive effect of independent directors on Saudi insurance firm performance. We focus on critical mass and find that a negative relationship remains when the number of independent

directors increases to six or more, despite the decline in performance. In general, boards with three, four, or five independent members do not show a significant relationship with performance. Similarly, an audit committee of less than four members does not affect performance; however, the size does have a positive effect on insurance performance when the committee has four members, but more than four hurts performance.

In general, we find that most firms lack expertise in managing audit committee size and board independence. Moreover, the audit committees do not appear to have any relationship with either internal or external auditors. These findings are not significant based on audit committee size and lack of independent results, which do not play an effective part in listed Saudi insurance companies.

We examine the effect of the CEO's age on Saudi insurance performance and find that an older CEO has better performance. To complement this result, we also analyse the effect of the CEO's retirement age. For CEOs over 60, we find an increase in significance from 10% and 5% to 1% when the CEO is post-retirement age. When CEOs stay in the position, we find a negative relationship between CEO turnover and firm performance and vice versa. This means that firms with poor performance should change their CEOs, as poor CEO performance has a significant negative effect on performance.

Our study also examines the relationship between firm performance and managerial pay using four pay variables, namely; director incentives, CEO and top executive pay, above-the-mean director incentives, and above-the-mean CEO and top executive pay. We find three of these four variables to relate positively to financial performance. These are director incentives, CEO and top executive pay, and above-the-mean director incentives, measuring above-the-mean director incentives using Tobin's Q and vice versa. However, above-the-mean CEO and top executive pay have the opposite effect on ROA and vice versa.

The increased age of a CEO means greater experience and an increase in the CEO's pay. This leads to better firm performance up to when the mean of the CEO's pay reaches the average CEO pay in the insurance industry. After this, the effect on performance turns negative. Firms allocate 10% of the profits to board directors as a reward for firm performance. This is an attractive incentive and explains the increase in significance from 5% to 1% for above-the-mean director incentives.

In addition, we find that Shariah-compliant firms and life insurance firms have similar results to all listed insurance firms in terms of the effect of board independence and audit committee size on performance.

The insurance sector in the KSA has been slow to adhere to new procedures and to comply with newly imposed governance regulations that require listed companies to improve transparency in corporate financial reporting (Al-Faryan and Dockery 2021). Our study reveals that 13 of the insurance companies listed in the Saudi market from 2008 to 2014 were not complying with certain corporate governance regulations in their first year due to a lack of experienced board members and executive management.

6.1. Implications

We believe that the Saudi corporate governance codes, along with other longer-term development plans, should be considered successful. Particularly, the 2009 changes made to the board and auditing committee size regulations, have had a positive impact on Saudi listed insurance firm performance. Further, insurance company structure influences firm practices and performance. Nonetheless, there is room for improvement and development, as the positive impact of these issues raises some questions.

Our study has implications for both domestic and foreign investors, including institutional investors, by highlighting the effective functioning of boards of directors and auditing committees. Domestic investors should see better governance as a positive sign—one they can take advantage of when investing in Saudi listed insurance firms at a time when the Saudi economy is looking to diversify and expand in accordance with the country's Vision 2030 plans. Foreign investors can diversify their portfolios by investing in the KSA, as it has now opened its markets and its economy in line with achieving this strategy.

The results also demonstrate the importance of the role of corporate governance in Saudi Arabia in relation to the issues studied. Access to foreign savings is important for diversifying the Saudi economy, as well as achieving economic growth. However, foreign investors will only be willing to invest in the KSA if they are confident that their investments are being monitored and protected. In the context of insurance firms, we highlight the growing compliance in the industry, reflecting the improvements in Saudi corporate governance practices.

Generally, the most interesting aspect of the findings of this study is that it not only evidenced the impact of corporate governance on financial performance but also, provided further insight on the impact by market share and insurance density. Therefore, the gross premia and insurance penetration are also significantly related to economic growth. (Apergis and Poufinas 2020; Balcilar et al. 2018; Alokla and Daynes 2017; Alokla et al. 2022; Gaganis et al. 2019)

6.2. Limitations

Our study is not without limitations. First, the main limitation is, in contrast to the banking sector, in the insurance sector in the KSA, there is a severe lack of available data (Alokla et al. 2022; Yousaf and Alokla 2022; Alokla and Daynes 2017). As a result, data are obtained from the CMA and Mubasher. Second, data availability restricts our analysis to seven years, as there are no data from our unique database available before that time. Financial costs are another constraint that exacerbates our data problem. Future studies should explore whether our results hold over longer periods. Third, corporate governance may vary from one insurance company to another based on many factors, such as the percentage of the government's share and external shareholders. Future research should consider testing the impact of corporate governance based on qualitative studies. Fourth, there may be other internal factors influencing the underlying relationships that are difficult to model. This may be exacerbated in the KSA by the lack of readily available data. In addition, there are few studies in the literature on the Saudi insurance market or on any developing economies for comparison with our study. However, we find that our results are robust to endogeneity and exogenous issues. Despite limited data and resources, we believe our study contributes by bridging the gap in the literature on corporate governance in the Saudi insurance sector. Further, it can prove useful to managers, investors, market practitioners, and regulators.

6.3. Recommendations

For some Saudi insurance firms, their losses have reached up to 50% of their capital, with these companies continuing to work only to increase or decrease capital rather than to find new ways to avoid losses. Working in the same manner in every successive administration only yields the same results, which is the continuation of losses. In addition, a change in departments must be followed by a change in the concept of management, which means making new decisions that change the company's path to avoid accumulated losses and increase profits. These decisions must be linked to risk management, which includes controlling risks by assessing them and then developing strategies to reduce or avoid them (Alokla and Daynes 2017). Additionally, depending on the risks a company faces, risk assessment may mean the care and regulation of risks and management of crises through financial management, operations, monitoring, and action.

To rectify problems caused by a lack of risk management, the board of directors must compensate the shareholders for the company's accumulated losses above 50%, as the board is responsible for monitoring the company, and its members are nominated by shareholders. In addition, to reduce risks, companies should be transparent, sophisticated, and work to establish modern insurance programs and solutions appropriate for the needs of the stage of the company, such as programs concerned with technical and informational dimensions applied in global markets but not yet in the Saudi market. As a result, policymakers should create a new authority for insurance development and regulations.

Moreover, the industry may benefit from a mandate to merge some insurance companies into whatever form is deemed suitable. This will limit the number of firms and, simultaneously, contribute to creating a more organised and dynamic market. Mergers allow companies the ability to change and expand as well as mix experiences and capabilities. Finally, companies should adopt modern marketing methods, which rely on online connections and social media and are more flexible in terms of reaching customers, as well as creating new customer segments.

Author Contributions: Conceptualization, M.A.S.A.-F.; methodology, M.A.S.A.-F. and J.A.; software, M.A.S.A.-F.; validation, M.A.S.A.-F. and J.A.; formal analysis, M.A.S.A.-F.; investigation, M.A.S.A.-F.; resources, M.A.S.A.-F.; data curation, M.A.S.A.-F.; writing—original draft preparation, M.A.S.A.-F.; writing—review and editing M.A.S.A.-F. and J.A.; visualization, M.A.S.A.-F. and J.A.; supervision, M.A.S.A.-F.; project administration, M.A.S.A.-F.; All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: We thank the editor and the reviewers for the helpful comments and suggestions that significantly enhanced this work. We also express our gratitude to the Saudi Arabia Capital Market Authority, Tadawul, and Mubasher for providing the data. The usual disclaimer applies.

Conflicts of Interest: The authors declare that they have no conflicts of interest.

Appendix A

Table A1. Saudi Arabia's annual inflation rate.

Year	2008	2009	2010	2011	2012	2013	2014
Inflation Rate (%)	9.87%	5.06%	5.34%	5.83%	2.87%	3.53%	2.24%

Source: WorldData.

Appendix B

Table A2. The effect of the inflation rate on insurance performance.

	ROA		ROE		Tobin's Q	
	RE	FE	RE	FE	RE	FE
Constant	191.6578 ** (94.1971)	206.6571 (127.4094)	548.3650 (341.5285)	483.8100 (511.2455)	117.466 *** (27.3461)	133.9358 *** (36.7349)
Inflation Rate (%)	−1.4913 *** (0.5308)	−1.4104 *** (0.5240)	−4.9384 ** (2.0455)	−4.6704 ** (2.1026)	−0.7000 *** (0.1523)	− 0.7387 *** (0.1511)
Ln(BS)	2.4135 (3.1675)	7.4700 (4.7397)	0.9498 (9.2462)	7.0212 (19.0185)	−0.9651 (0.9417)	−0.7239 (1.3666)
Ln(Assets)	1.9500 *** (0.6704)	3.1728 *** (1.2014)	8.6261 *** (1.8117)	18.2202 *** (4.8206)	−2.1955 *** (0.2017)	−3.0764 *** (0.3464)
$Ln(Firm^{Age})$	5.7946 *** (1.6346)	8.5919 ** (3.4583)	0.1477 (4.5319)	4.3745 (13.8770)	0.3970 (0.4912)	0.3821 (0.9971)
VOL	0.0162 (0.0247)	0.0496 * (0.0274)	−0.0003 (0.0881)	0.0445 (0.1100)	0.0220 *** (0.0072)	0.0220 *** (0.0079)
RiskRet	0.0098 (0.0268)	−0.0173 (0.0312)	−0.0073 (0.0880)	−0.0499 (0.1250)	−0.0014 (0.0078)	−0.0030 (0.0090)
DeInMarket	−5.5036 (3.6416)	−3.6340 (3.7955)	−16.8457 (13.9176)	−13.4009 (15.2297)	−2.5156 ** (1.0465)	−2.4665 ** (1.0943)

Table A2. *Cont.*

	ROA		ROE		Tobin's Q	
	RE	**FE**	**RE**	**FE**	**RE**	**FE**
Ln(gross written)	−9.9836 *** (3.7831)	−12.2869 ** (5.3688)	−29.0856 ** (13.7680)	−35.1452 (21.5430)	−2.7147 ** (1.0981)	−2.7016 * (1.5479)
Wald Chi^2	60.74 ***		33.26 ***		162.14 ***	
F Statistic		7.37 ***		2.90 ***		13.38 ***
R^2 (%)	21.77	19.36	14.89	13.98	52.95	51.93

Notes: *, **, and *** represent significance at 10%, 5%, and 1%, respectively. Standard errors are in parentheses. *Inflation Rate (%)* is the percent inflation rate = $\frac{\text{Final Consumer Price Index Value} - \text{Initial Consumer Price Index Value}}{\text{Initial Consumer Price Index Value}} \times 100$; *Ln(BS)* is the natural logarithm of the board size; *Ln(Assets)* is the natural logarithm of firm assets; $Ln\left(Firm^{Age}\right)$ is the natural logarithm of firm age; *VOL* is volatility; *RiskRet* is (risk retention) net premiums written over gross premiums written, and *DeInMarket* (depth of insurance market) is defined as gross written premiums divided by total GDP. *Ln(gross written)* is the natural logarithm of gross premiums written, measured by the sum of both direct premiums written and assumed premiums written, before deducting the ceded reinsurance. We use the following equation for this model $PERF_{it} = \alpha + \beta_1\ Inflation\ Rate\ (\%)_{it} + \beta_2 Ln\ (BS)_{it} + \beta_3 Ln\ (Assets)_{\ it} + \beta_4 Ln\ \left(Firm^{Age}\right)_{it} + \beta_5 VOL_{it} + \beta_6 RiskRet_{it} + \beta_7 DeInMarket_{it} + \beta_8 Ln\ (gross\ written)_{it} + \varepsilon_{it}$.

Note

[1] No insurance company offers only life insurance, but many offer various types of insurance, such as aviation, energy, engineering, marine, property, fire, accident and liability, motor, and health.

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