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Impact of Saudi corporate governance code and governance structures on industrial firms' performance in Saudi Arabia

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ABSTRACT

This research focuses on examining how the recent Saudi Corporate Governance Code (SCGC) and internal governance structures within companies affect the performance of industrial firms listed on the Saudi Stock Exchange. The authors studied 62 industrial firms from 2012 to 2020. They analyzed data using two models to test their hypotheses, looking at firm performance through two financial indicators: return on assets (ROA) for the first model and return on equity (ROE) for the second. Both models considered the same factors: SCGC, the size and independence of the board, the size and independence of the audit committee, how often the audit committee meets, and how concentrated the ownership is. The results indicated that applying the SCGC leads to better company performance based on ROA. However, there was no noticeable impact on performance from the board or audit committee size. Likewise, having more audit committee meetings did not improve performance. On the other hand, the independence of the board and audit committee, along with ownership concentration, did have a positive effect on performance. This study adds to the discussion on the economic impacts of the SCGC in the Saudi market, offering valuable insights for companies, investors, and policymakers like the Capital Market Authority (CMA) and the Saudi Organization for Chartered and Professional Accountants (SOCPA). These insights could guide adjustments to the SCGC that better suit the unique aspects of the Saudi market.

1. Introduction

Since the Enron bankruptcy in 2002, governments and public companies have realized the importance of maintaining control over managerial teams through corporate governance structures. Subsequently, a multitude of corporate governance regulations has emerged worldwide, particularly in emerging countries. One such regulation is the Saudi Corporate Governance Code (SCGC), which was initially promulgated in 2006 and recently revised in 2017. Saudi Arabia, as an emerging country, has undergone significant economic, social, and institutional transformation over the past decade. Notably, the capital market in Saudi Arabia has opened up to foreign investors, leading to substantial enhancement in the quality of corporate governance, particularly in alignment with the Saudi Vision 2030. Given the rapid expansion of Saudi Arabias stock exchange market, often referred to as Tadawul, and the substantial changes in the institutional and economic landscapes of Saudi listed firms, it is intriguing to explore the impact of the new SCGC on firm performance. On the one hand, laws and regulations may improve the relevance of financial information and, on the other hand, arouse firm performance (Kijkasiwat et al., 2022; Puni and Anlesinya, 2020; Chen and Zhang, 2014; Bhagat and Bolton, 2008). Moreover, corporate governance (CG) is often argued to be a crucial tool for resolving agency problems when conflicts arise between principals and agents, ultimately leading to improvements in firm performance. Since Shleifer and Vishny's (1997) seminal work, the positive effect of good governance on firm performance has been well-established. Furthermore, the literature makes clear that the impact of corporate governance on firm performance varies according to the characteristics of corporate governance structures, such as board size, director independence, and audit committee efficiency (Abbott et al., 2003; Bhagat and Bolton, 2008). If agency theory is aimed at

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safeguarding the interests of stockholders against opportunistic behavior and the moral hazard of managerial teams, stakeholder theory takes into consideration the interests of a diverse range of stakeholders, such as customers, suppliers, and employees, extending beyond just shareholders or owners (Solomon, 2004). Essentially, stakeholder theory provides a framework for organizations to operate in a socially responsible manner by recognizing the concerns and interests of all those who are affected by or can influence the organization. Furthermore, stakeholder theory, which is defined as a theory of organizational management, identifies a stakeholder as any individual or group that can impact or be impacted by an organization's actions, decisions, policies, or goals (Freeman, 1984). From this perspective, we assert that the implementation of a robust corporate governance structure aligns with the goals of stakeholder theory, consequently leading to an enhancement of company performance. Specifically, investing in structures that minimize risks and improve transparency will enhance the network of relationships between companies and their stakeholders. In the same context, Buchholz (1989) emphasized the importance of shared interests among involved parties. In response to this challenge, Buchholz (1989) introduced innovative solutions, which included augmenting shareholders' rights to participate in critical management decisions and adjusting the composition of boards by integrating more external directors to address concerns about boards being excessively deferential to management. Additionally, Buchholz (1989) considered employee representation at specific levels within corporate governance as part of these solutions. The objective of this study is to investigate the effect of internal corporate governance structure (board of directors, audit committee, and ownership concentration) on the performance of Saudi industrial listed companies after the amendment of the SCGC in 2017. We prioritize internal corporate governance structures over external ones for several reasons. First, prior studies conducted in the Saudi Arabian context have underscored the significance of internal corporate governance factors in supervising directors' decisions and improving firm performance. These factors, which are primarily discussed in the literature, include the board of directors, the audit committee, and ownership concentration (Boshnak, 2021; Al-Matari et al., 2012; Buallay et al., 2017; Fuzi et al., 2016). Conversely, we observe a comparatively lower level of attention dedicated to the external corporate governance structure in Saudi Arabia, particularly concerning the stock market. In Saudi Arabia, the stock market (Tadawul) experienced a significant crash in 2006. Despite numerous efforts by the Capital Market Authority (CMA) and the government, the disciplinary role of the Saudi stock market has remained inadequate since that crisis. In addition, earlier studies have established the limited efficiency (low-level efficiency) of Tadawul (Al-Faryan and Dockery, 2021). Thus, let us be skeptical about the stock market's efficiency as a supervisor process for managerial behavior. Considering the unique socio-economic characteristics of Saudi Arabia, we believe that focusing on the internal corporate governance structure can offer a better analysis of the governance structure that can promote firm performance. To achieve the aim of this study, we use panel data for two periods: Before and after the implementation of SCGC, from 2012 to 2020. Since we use two different accounting measures of firm performance (ROA and ROE), we conduct two separate regressions for each measure. Firm performance through this framework is explained by the efficiency of the board of directors (two proxies are used to assess board efficiency: Size and independence), audit committee efficiency (measured by the size, members' independence, and meeting frequency), ownership concentration, and the promulgation of SCGC.

Despite considerable attention given by the Saudi government to corporate governance and how to enhance firm performance, only a few studies have been conducted in this area within the Saudi context. Therefore, we find it interesting to focus on the added value of the recent regulation "SCGC" on the performance of industrial listed companies in KSA. Based on the results of this study, we expect to address theoretical and practical issues related to the improvement of the Saudi corporate governance structure. For the research community, we aim to make a relative contribution to the limited existing literature in the Saudi context and encourage future research in this growing academic field. Regarding regulatory actors, we believe that certain actions can be taken to better adapt the best international corporate governance structure to the specific institutional and cultural characteristics of Saudi Arabia. The remainder of the paper is organized as follows. Section 2 describes the historical development of corporate governance regulation in KSA. Literature review and hypothesis developments are provided in Section 3. The methodology is explained in Section 4. Results and discussions are presented in section 5. The last section is dedicated to the main conclusions, limitations, and potential future research extensions.

2. Historical overview of corporate governance development in Saudi Arabia

The initial concerns surrounding corporate governance regulation emerged in 2003, coinciding with the establishment of the Capital Market Authority (CMA). The CMA played a pivotal role in overseeing the corporate governance structures of listed firms in the Saudi stock market Tadawul.

Following the inception of the CMA, the Saudi stock market witnessed substantial and rapid growth until close to 2006, when Tadawul experienced a significant crash. Essentially, this crisis was part of the 2006 international financial crisis. Despite the adverse impact of this severe

financial crisis on the Saudi economy, a decisive step was taken to thoroughly assess the effectiveness of corporate governance mechanisms within Saudi public companies. In November 2006, this effort culminated in the introduction of the SCGC. The primary objective of this code was to rebuild trust among investors in the Saudi stock market by safeguarding their interests. Consequently, a substantial portion of the SCGC was dedicated to reinforcing shareholder rights. The Saudi corporate governance framework, established in 2006, remained in effect for several years until 2017. In response to the economic and social changes in Saudi Arabia, particularly the introduction of Vision 2030, which aims to attract foreign investments and improve transparency and accountability, a new code was issued in 2017 (Hammad, 2019). This new code aligned Saudi Arabia's regulations with international best practices in corporate governance and potentially explained the revision of the 2006 SCGC. Notably, the Saudi Ministry of Commerce played a pivotal role in this process by enacting a comprehensive law that addressed various aspects of corporate oversight. This development was effectively implemented in May 2016 and marked the initial phase of amending the 2006 SCGC, as highlighted by Alshowish (2016). The 2017 SCGC primarily focused on two key components. First, it emphasizes disclosure and transparency, building upon efforts initiated by the Ministry of Commerce since 1985. Second, it addresses shareholders' rights and the structure of boards of directors, introducing several transformations in listed Saudi companies to align them with the best international governance practices, particularly those of the Anglo-Saxon model.

3. Literature review and research hypothesis

Studies that have examined the relationships between corporate governance, corporate ownership structure, and firm performance, both theoretical and empirical in financial accounting, have produced mixed findings (Kao et al., 2019; Pham and Islam, 2022; Lee and Ko, 2022). We can divide the previous studies into two main types: The first research focus considers separate corporate governance tools (board of directors, audit committee, etc.). However, the second uses a corporate governance index that shows the overall effect of corporate governance variables.

As part of the first focus, Haji and Mubaraq (2015) conducted research in Malaysia, assessed the effect of the Malaysian Corporate Governance Code in addition to ownership structure on firm performance. The authors examine two groups of observations before and after the revision of the Malaysian corporate governance code during the period from 2006 to 2010. The empirical results are mixed. The authors find a negative effect of the size of the board of directors and audit committee on both financial and accounting performance. However, their study shows the positive effect of the chairman's independence on firm performance before and after the adoption of the new corporate governance code.

Mansour et al. (2022) discovered a substantial positive influence of corporate governance quality on the performance of Jordanian nonfinancial listed firms on the Amman Stock Exchange from 2014 to 2019. This connection is robustly supported by the structure of the capital firm.

In the Indian context, Bhatt and Bhatt (2017) examined how board characteristics could impact firm performance using a sample of the top family-listed companies from 2002 to 2012. Contrary to expectations, the authors observed a negative impact of board structure on firm performance in family firms compared with non-family firms.

Kijkasiwat et al. (2022) conducted an empirical analysis using GMM panel data of 2568 firms from developed and emerging economies from 2002 to 2017. The study explored the relationship between corporate governance and firm performance by considering the influence of leverage levels. In both emerging and developed economies, the authors established that the positive relationship between firm performance and corporate governance structure is strengthened by the financial leverage level. Specifically, in emerging countries, firms with large boards of directors have low leverage levels, whereas, in developed countries, only small boards use low leverage levels to enhance firm performance.

As previously mentioned, some researchers have opted to construct an index to gauge overall corporate governance strength instead of examining the distinct impacts of various components of the corporate governance structure (Ghuslan et al., 2021; Ghasemi et al., 2017).

Gompers et al. (2003) studied how corporate governance affected firm performance in the 1990s. They created a governance measure known as GIM's governance measure, which is an index based on 24 corporate governance provisions collected by the Investor Responsibility Research Center (IRRC). These provisions include factors like golden parachutes and voting rights. Their main discovery was that firms with strong shareholder rights performed 8.5% better annually than those with weak shareholder rights during that decade. The authors measured firm performance using stock returns. Their findings suggest that effective governance significantly enhances corporate performance. However, Bebchuk et al. (2009) later criticized this index, particularly questioning the equal weighting of its 24 items. They argued that these components might differ in importance and could be correlated, potentially leading to misleading results. Brown and Caylor (2004) developed a more refined corporate governance index called Gov-score using data from Institutional Shareholder Services (ISS). This index includes 51 governance factors focusing on board structure, audits, and ownership. Analyzing the operating performance of 2,327 firms, they found that companies with robust governance structures significantly outperformed those with

weaker ones. Their results appear more accurate than those of Gompers et al. (2003).

In a socio-economic context close to Saudi Arabia, Al-Gamrh et al. (2020) analyzed 501 firm-year observations from 2008 to 2012, coinciding with the implementation of the corporate governance code in the UAE. The sample included all listed firms on the Abu Dhabi Stock Exchange and the Dubai Financial Market. Instead of examining individual corporate governance tools in isolation, the authors developed a comprehensive corporate governance index. The findings indicate a limited impact of corporate governance practices within the economic landscape of the UAE. Furthermore, analysis of the sub-indices of corporate governance reveals that board functioning and ethics emerge as the most influential factors in enhancing investment opportunities and firm performance.

In the context of the Gulf Cooperation Council (GCC), Pillai and Al-Malkawi (2016) examined how well companies in GCC countries follow corporate governance (CG) principles. They used both traditional and non-traditional methods to measure this. The study had three main goals. Firstly, it aimed to improve the Corporate Governance Index (CGI) developed by Al-Malkawi et al. (2014) by including both financial and non-financial companies listed on GCC stock markets. Previously, this index was only used for non-financial companies. Secondly, alongside the CGI, the researchers introduced a new index called the Corporate Governance Deviation Index (CGDI). This index aimed to give more insight into governance quality in GCC countries. Lastly, the study wanted to see if there were differences in governance adherence between financial (FIN) and non-financial (NFIN) companies. The findings showed that most firms in GCC countries followed practices that are considered good for disclosing information, making boards effective, and protecting shareholders' rights. The unweighted CGI results showed that the UAE had the highest adherence to internal governance mechanisms among GCC countries, followed by Oman and Saudi Arabia. Additionally, the CGDI results showed that higher governance scores were linked to lower deviation indices. The study also found a significant difference in governance adherence between FIN and NFIN companies in the GCC, with FIN companies showing higher levels of compliance.

Recently, Tawfik et al. (2022) focused on the relationship between corporate governance mechanisms and firm performance in GCC countries. They observe 266 company-year observations from 2009 to 2017. The results indicate that a board size of fewer than nine members is an effective corporate governance mechanism. However, the study reveals that firm performance significantly declines with institutional ownership and chief executive officer duality but increases with royal ownership. Nguyen and Dao (2022) conducted a meta-analysis of 428 studies worldwide to assess the influence of firm governance structure and ownership concentration on operational effectiveness. The authors demonstrated a positive relationship between corporate governance measures, board size, institutional ownership, and enterprise worth. From previous literature, we notice that studies dealing with separate corporate governance factors and those using an overall index for corporate governance report varied results regarding the correlation between corporate governance structure, ownership configuration, and firm performance.

Two main explanations could be given for the mixed results: the first, as previously mentioned, is related to the measure of corporate governance efficiency (index vs. separate measure), and the second concerns the assessment of firm performance (accounting measure vs. stock market measure).

Limited research has been conducted in Saudi Arabia on the link between corporate governance design and operational effectiveness. Table 1 summarizes the most relevant studies conducted in the Saudi context within this research field.

As for us, given the specificities of the Saudi context and in light of the provisions of the SCGC, we test in this study the following four main hypotheses:

H1: A positive correlation exists between the implementation of SCGC and the Saudi firms' performance.
H2: A positive correlation exists between the board of directors' effectiveness and the Saudi firms' performance after the implementation of SCGC.

We suggest testing H2 via two sub-hypotheses as follows:

H2.1: There is a positive correlation between the size of the board and the performance of Saudi firms after the implementation of SCGC.
H2.2: There is a positive correlation between the independence of the board members and the performance of Saudi firms after the implementation of SCGC.
H3: A positive correlation exists between the audit committee's effectiveness and the performance of Saudi firms after the implementation of SCGC.

We suggest testing H3 via three sub-hypotheses as follows:

H3.1: There is a positive correlation between the size of the audit committee and the performance of Saudi firms after the implementation of SCGC.
H3.2: There is a positive correlation between the independence of the audit committee members and the performance of Saudi firms after the implementation of SCGC.
H3.3: There is a positive correlation between the meeting frequency of the audit committee and the performance of Saudi firms after the implementation of SCGC.
H4: A positive correlation exists between the firm ownership concentration and the performance of Saudi firms after the implementation of SCGC.

Table 1: Literature review in the Saudi context

Reference	Period and sample	Methodology/variables	Main results
Almoneef and Samontaray (2019)	2014-2017 12 Saudi listed banks	Multivariate regression: Dependent variables: Bank performance measured with Tobin's Q, ROA, and ROE Independent variables: The board of directors features size, independence, meetings, number of board committees, and foreign board membership Audit committee characteristics: Size, meeting frequency, and independence	ROE increases with the board size, audit committee meeting, and bank size ROE decreases with the board's independence ROA increases with the board size but decreases with the board meeting frequency Tobin's Q increases with the size and the independence of the board but decreases with the size and the independence of the audit committee
Al-Matari et al. (2012)	2010 135 Saudi non-financial companies	Multivariate regression: Dependent variable: Tobin's Q Independent variables: Board composition, CEO duality, Board size, Audit committee independence, Audit committee meeting, Audit committee size Control variables: Firm size and Leverage	No association between CEO duality, Board size, Audit committee independence, Audit committee meetings, and firm performance. The other variables have no significant effect
Ghabayen (2012)	2011 102 Saudi non-financial companies	Multivariate regression: Dependent variable: ROA Independent variables: Audit committee size, Audit committee composition, Board size, Board composition	Audit committee size, independence, and board size positively affect firms' performance, whereas the Board composition negatively affects firm performance (ROA)
Habbash (2015)	2006-2009 338 large Saudi companies	Multivariate regression: Dependent variable: ROA Independent variables: Board independence Board size Duality chairman and CEO Family ownership	The duality and independence of the board have a positive impact on a firm's performance. No impact was found regarding family ownership on firm performance
Bazhair (2021)	2010-2019 7 listed companies of healthcare equipment and services	Multiple Linear Regression Dependent variable: Firm performance: ROA and ROE Independent variables: Board size: BS Firm size: FS	Both board size and firm size have a positive effect on firm performance
Buallay et al. (2017)	2012-2014 171 Saudi-listed companies	Multiple Linear Regression: Dependent variable: Firm performance: ROE, ROA and Tobin's Q Independent variables: Ownership of the three largest shareholders, size of the board of directors, independence of the board of directors, and duality of posts of chairman and CEO	No significant effect of corporate governance strength on a firm's performance The ownership concentration and the independence of the Board of Directors were not related to market firm performance. The size of the Board of Directors has a significant effect on a firm's performance
Boshnak (2021)	2017-2019 210 Saudi-listed companies	Manual content and regression analysis board size, independence, and meeting frequency, audit committee size and meeting frequency, CEO duality and ownership concentration on the operational, financial, and market performance	Firm performance is negatively associated with board size, independence of audit committee meeting frequency, and the presence of CEO role duality. An improvement in firm performance was recorded with board meeting frequency and ownership concentration
Fallatah and Dickins (2012)	2006-2009 92 Saudi-listed companies	Performance measured by: ROA Tobin's Q market value of equity Corporate Governance Index	No relationship between ROA and corporate governance A significant association between market value and corporate governance strength

4. Methodology and data

4.1. Data

This study explores the effect of SCGC implementation on the performance of Saudi industrial listed firms. We also consider the strength of corporate governance and ownership structure in terms of a firm's operational effectiveness. Two sets of data are analyzed before and after the promulgation of the recent SCGC. Our sample consists of 62 Saudi industrial listed companies for two time periods, leading to 310 observations covering 2012 to 2016 and 248 observations for 2017 to 2020. The data were collected manually from the annual reports of listed companies disclosed on the Tadawul website (saudiexchange.sa). The main criteria retained for the final sample are listed in Table 2.

Table 2: Sample selection

129 firms	Initial sample
	Excluded firms:
-13	Financial institutions (banks, insurance, etc.)
-25	Nonindustrial companies
-29	Companies with missed data (information about corporate governance structure unavailable)
62	Final sample

4.2. Models

To test our hypotheses, we first conducted a statistical comparison of firms' performance pro and post-SCGC promulgation. Second, we estimated the following multiple regressions:

$$Firm\ performance = f\ (SCGC, board\ of\ directors'\ characteristics, audit\ committee\ efficiency, ownership\ concentration)$$

$$ROA_{it} = \lambda_i + \alpha_1 SCGC_{it} + \alpha_2 BSIZE_{it} + \alpha_3 BIND_{it} + \alpha_4 ACSIZE_{it} + \alpha_5 ACIND_{it} + \alpha_6 ACMEET_{it} + \alpha_7 OWNCONC_{it} + \varepsilon_{1,it} \quad (1)$$

$$ROE_{it} = \lambda_i + \beta_1 SCGC_{it} + \beta_2 BSIZE_{it} + \beta_3 BIND_{it} + \beta_4 ACSIZE_{it} + \beta_5 ACIND_{it} + \beta_6 ACMEET_{it} + \beta_7 OWNCONC_{it} + \varepsilon_{2,it} \quad (2)$$

where, the subscribes i and t denote the individual effect and the time period, respectively, λ_i is the fixed effect, and $\varepsilon_{j,it}$ is the error term for $j = [1,2]$.

To measure firm performance, we use two accounting proxies: ROA (return on assets) and ROE (return on equities). We then run two regressions (1 and 2) using the two previous accounting measures of firm performance.

Based on the existing literature, we discern two lines of research. The first approach involves accounting indicators for evaluating performance, whereas the second one incorporates financial market indicators, such as the Tobin Q ratio. In light of the demonstrated weak form efficiency of the Saudi financial market, as indicated by various studies (Asiri and Alzeera, 2013; Al-Faryan and Dockery, 2021), we strongly believe that stock prices may not accurately represent a measure of firm performance. Consequently, we opted for accounting indicators extracted from financial statements publicly available on Tadawul rather than market-based indicators.

For the independent variables, we test the board of directors' effectiveness through two criteria: size and independence of directors, and we assess the audit committee's effectiveness using three indicators: size, independence, and meeting frequency. We appreciated ownership concentration using the percentage of equities maintained by the three main stockholders. Table 3 summarizes the measures and codes for the variables used in our two main regressions as follows.

Table 3: Variables measurement summary

Dependent variables		
Code	Variables	Measurement
ROA	Return on assets	Earnings before interest and tax / Total assets
ROE	Return on equities	Earnings before interest and tax / Total equities
Independent variables		
SCGC	SCGC Adoption	Dummy variable: 1 if observation from 2017-2020 (post-SCGC adoption) 0 otherwise (pre-SCGC adoption)
BSIZE	Effectiveness of the board of directors	Board size: Number of board members
BINDEP		Board independence: Percentage of non-executive members
ACSIZE	Audit committee effectiveness	Audit committee size: Number of the audit committee members
ACMEET		Meeting frequency: Number of meetings of the audit committee per year
ACIND		Audit committee independence: Percentage of independent members in the audit committee
OWNCONC	Ownership concentration	Percentage of capital held by the three main shareholders

4.3. Descriptive analysis

Table 4 shows that firm performance ranges from -0.33 to 0.408, taking ROA as a performance indicator, and from -0.251 to 0.653 for ROE, with an average of 0.062 for ROA and 0.123 for ROE. The standard deviations for both ROA and ROE could be considered low (respectively about 0.05 and 0.02, respectively). This can be a sign of the homogeneity of the firms constituting our sample, at least in terms of their financial position. Regarding the board of directors' features, we find that the board size of

industrial Saudi-listed companies varies between four and 11 members, with an average of 8. These statistics seem to be comparable to those of other emerging economies (such as Turkey and Pakistan, as cited in Kijkasiwat et al. (2022)). The size of the audit committee ranged between three and five, with an average of 4.56. These statistics reveal the relative compliance of Saudi industrial companies with the SCGC provisions. However, we notice non-compliance with the SCGC regarding the independence of members of the audit committee. The code requires the full independence of audit committee members. In our sample, we recorded a mean of 65% for the variable ACIND, which represents audit committee independence. However, it should be noted that more than 50% of audit committee members are independent (minimum variable ACIND=57%). This finding shows the importance of the independence of audit committee members.

Overall, we can touch on the compliance of Saudi-listed industrial companies with the provision of SCGC, especially regarding audit committee size and meeting frequency. This observation is consistent with that reported by Buallay et al. (2017). In light of this latest study, the authors have found a mean corporate governance compliance of about 64.1%, which could be considered a respectable percentage compared to GCC economies (Buallay et al., 2017).

Finally, ownership concentration statistics show a relative concentration of capital between the hands of the three main shareholders (the mean is greater than 50%, with a maximum of about 90%). This finding reflects the economic ownership structure of Saudi companies, as mentioned by Buallay et al. (2017). However, we should notice the great divergence of the ownership concentration within the companies constituting our sample (standard deviation of about 0.463).

In summary, statistics seem to be close to those recorded in GCC economies, especially in Bahrain (Hamdan and Al-Sartawi, 2013) and GCC countries (Pillai and Al-Malkawi, 2016; Tawfik et al., 2022) on the one hand, and corporate governance characteristics seem to comply with Saudi corporate governance regulations on the other hand (Habbash, 2015).

Table 4: Descriptive statistics (period: 2012-2020)

Variable	ROA	ROE	BSIZE	BIND	ACSIZE	ACIND	ACMEET	OWNCONC
Mean	0.062	0.123	8.54	0.634	4.56	0.65	5.12	0.657
Median	0.032	0.042	6.32	0.54	4.122	0.7	4.34	0.561
Minimum	-0.33	-0.251	4	0.18	3	0.57	2	0.35
Maximum	0.408	0.653	11	0.89	5	1	7	0.89
Standard deviation	0.05	0.02	0.23	0.134	0.67	0.01	1.89	0.463

Number of observations =558 (pooled data)

To better analyze our data, we conducted a student's means comparison test. This test aims to compare firm performance between two sub-periods: From 2012 to 2016 (before the promulgation of SCGC) and from 2017 to 2020 (after the promulgation of SCGC). The main results of the t-test are displayed in Table 5 for both measures of firm performance (ROA and ROE).

Table 5: Comparative analysis of firm performance before and after SCGC promulgation

Variable description	95% confidence interval	Standard deviation	Standard error	Mean	Observations
ROA (ROE) pre-SCGC promulgation	.0323 (.256)	.0353 (.275)	.008 (.124)	.034 (.025)	310
ROA (ROE) post-SCGC promulgation	.0343 (.295)	.036 (.535)	.006 (.298)	.023 (.145)	248
Difference (diff)	.0034 (.0061)	.0003 (.0012)	.0105 (.002)	.0001 (.0009)	-
Statistical test (t-value)	-	-	-	t = 1.765 (1.876)	-
Mean of difference	**Mean (diff) = Mean (ROA(ROE)-PRE- SCGC – ROA(ROE) POST- SCGC)**				
P-values	Pr(T > t) = 0.050 (.04)	Pr(|T| > |t|) = 0.001 (0.002)	Pr(T < t) = 0.949 (.856)	-	-

In light of the t-test results shown in Table 5, we notice a p-value of 0.001 for ROA (and of 0.002 for ROE), which is much smaller than 5%; therefore, we reject the hypothesis of no differences in means between the two sets of observations. This means that firm performance (measured with two different accounting indicators, ROA and ROE) is significantly different before and after SCGC implementation.

4.4. Correlation analysis

Before running our multivariate regression, we applied the Pearson correlation matrix to all independent variables to detect an eventual multicollinearity problem. The highest coefficient is 0.343 and has been recorded between audit committee size and audit committee independence. Table 6 shows a correlation of -0.328 between audit committee independence and SCGC promulgation.

Despite these observations, no serious problems of correlation could be underlined because all coefficients in the Pearson matrix are under 0.7 (Gujarati, 2003).

5. Empirical results

The main results of the empirical regressions (estimation with fixed effects) conducted on panel data are displayed in Table 7. Our model explains the effects of the new Saudi code, board of directors, audit committee, and ownership concentration on corporate accounting performance measures. We estimate the two models separately for each

measure of firm performance (return on assets (ROA) and return on equity (ROE)).

The adjusted R2 for model 1 and 2 are respectively about 0.37 and 0.42, with a significant F-test (F=8.743, p-value<0.001 for model 1 and F=9.509, p-value<0.001 for regression2). These results are consistent with those of previous studies, especially Boshnak (2021) in KSA, Al-Gamrh et al. (2020) in UAE, and Tawfik et al. (2022) in the GCC region.

Table 6: Pearson correlation

	SCGC	BSIZE	BINDEP	ACSIZE	ACMEET	ACIND	OWNCONC
SCGC	1.000						
BSIZE	-0.134	1.000					
BINDEP	0.067	0.081	1.000				
ACSIZE	0.045	0.202	-0.141	1.000			
ACMEET	0.101	0.163	0.358	– 0.100	1.000		
ACIND	– 0.328	0.226	0.162	0.343	-0.224	1.000	
OWNCONC	0.245	-0.543	-0.753	0.289	0.367	-0.134	1.000

Table 7: Multivariate fixed effect regression results (1, 2)

	ROA		ROE	
	Coefficient	P >|t|	Coefficient	P >|t|
SCGC	0.163	0.09*	– 0.097	0.291
BSIZE	-0.023	0.123	– 0.065	0.254
BINDEP	0.256	0.09*	0.344	0.03**
ACIND	0.165	0.000***	0.315	0.18
ACSIZE	– 0.035	0.563	0.015	0.650
ACMEET	– 0.004	0.124	0.003	0.113
OWNCONC	0.048	0.03**	0.158	0.1*
Constant	-0.02	0.34	0.15	0.23
F-statistics	8.743	0.0003***	9.509	0.000***

***: P-value < 0.01; **: P-value < 0.05; *: P-value < 0.1

Regarding the implementation of the Corporate Governance Code, we find partial support for hypothesis H1 when using ROA as a performance indicator (0.163, p-value<10%). However, when performance is measured by ROE, the results do not show significant changes, indicating a non-significant deterioration in performance. This mixed evidence might stem from several factors. Firstly, the regulation is relatively new, and there might not have been sufficient awareness among firms, directors, and shareholders about the guidelines set by the code. Secondly, Saudi Arabia has undergone substantial cultural and socio-economic changes in the past decade. Adapting to these changes, particularly within an inefficient stock market characterized by low transparency and widespread non-compliance with the SCGC, will require more time.

From Table 7, we conclude that the size of the board has no significant effect on firm performance, neither measured by ROA nor by ROE. Therefore, we reject H2.1. This result corroborates those of Al-Matari et al. (2012) and Bajaher et al. (2020) in the Saudi context.

Regarding board members' independence, our results indicate that the independence of audit committee members significantly influences Saudi companies' performance in terms of the two measures retained of firm performance (ROA and ROE). This outcome aligns with the findings of Boshnak (2021) and Al-Matari et al. (2012) in KSA and Haji and Mubaraq (2015) in Malaysia. Therefore, we deduce from our empirical results the acceptance of H2.2. Overall, we can explain the results found on the board of directors' effectiveness by the fact that the board has been the most popular tool for governance for years, even before the appearance of the audit committee in the Saudi context. The role of the board in the firm governance process seems to have significantly improved after the promulgation of the SCGC. This code stipulates that most directors must be independent. In fact, we noticed the existence of three categories of members on the board of directors: Executive members, non-executive members, and independent members. When the majority of board members are independent, we expect that decisions, especially strategic ones, should be more objective and rational, aligned with the interests of the whole company rather than the restricted and opportunistic interests of executive and non-executive directors. Thus, this could only translate into animprovement in the company's performance.

Similar to the effect of board size, the number of audit committee members does not significantly affect firm performance. This conclusion applies to both the accounting measures of performance: ROA and ROE. Therefore, our empirical findings do not support hypothesis H3.1. However, this result aligns with research suggesting that larger committees may impair firm performance due to higher communication costs and more complex decision-making processes. Our results corroborate Boshnak's (2021) findings in the Saudi context and Haji and Mubaraq (2015) in Malaysia. Contrarily, the audit committee independence improves significantly the Saudi firm performance measured by ROA (0.165, p-value<1%), but the coefficient associated with audit committee independence is not significant when performance is measured by ROE. Therefore, hypothesis H3.2 is not fully supported by our empirical analysis. From previous literature, the results concerning the audit committee are contrary to our results, especially in the Saudi context and GCC region (Fallatah and Dickins, 2012). Oudat et al. (2021) in Bahrain, Almoneef and Samontaray (2019)

in the Saudi banking industry, and Boshnak (2021) in the Saudi stock market exhibited a non-significant effect of audit committee independence on firm performance. This evidence leads us to have deeper reflections on the profile of audit committee members, especially their knowledge and expertise in accounting and finance. We estimate that independence alone is not sufficient to outperform or guarantee the effectiveness of the audit committee despite the compulsory regulation regarding audit committee members' independence. We estimate that analyzing the interaction of audit committee independence and the expertise of members should provide more conclusive results (Zgarni et al., 2016). Concerning audit committee frequency meetings, a non-significant effect was found on firm performance in the Saudi context. Therefore, we reject hypothesis H2.3. This finding aligns with Al-Matari et al. (2012) but does not corroborate Boshnak (2021) within the Saudi context.

From Table 7, we report that ownership concentration significantly improves firm performance for both performance measures retained in this study (0.048, p-value<5% for ROA and 0.158, p-value<10% for ROE). This finding confirms H4 and corroborates the findings of Boshnak (2021) and Yasser and Al Mamun (2017). We can explain this result by the socioeconomic specificities of the Saudi context, which is characterized by a highly concentrated family ownership despite the diversity of this ownership. As underlined by Alajlan (2004), the Kingdom of Saudi Arabia could be considered the highest concentrated ownership not only in the GCC region but also in the Arab world, and family relationships are so robust in Saudi Arabia that they are greatly involved in business and economic transactions. Therefore, an interesting supervising role should be ensured by the main shareholders, especially those related to directors' decisions, reducing agency conflicts and improving firm performance (Mallin, 2004; Al-Matari et al., 2012).

In summary, our findings provide evidence that the independence of both the board of directors and audit committee members, besides ownership concentration, significantly enhances the performance of Saudi firms. The mandatory incorporation of independent directors in the structure of the board of directors and audit committee represents a strategic move aligning with Saudi Arabia's 2030 vision (Nurunnabi, 2017), aimed at leveraging the skills and expertise of these independent members rather than merely conforming to the SCGC guidelines. Notably, our findings indicate that neither board nor audit committee size contributes to improved firm performance in the Saudi context (Koldertsova, 2011). This suggests that smaller boards and more compact audit committees tend to communicate and excel more effectively than their larger counterparts do. We also observe partial support for the idea that a higher frequency of audit committee meetings may enhance Saudi firms' performance. Finally, regarding the new regulation, we record some improvements in Saudi firm performance after the promulgation of the new corporate governance code. However, we believe that more time is needed to appreciate the socio-economic benefits of this regulation.

Despite the intriguing results from our empirical study, it is important to highlight the potential omission of certain economic factors specific to the context of Saudi Arabia, which is the third largest oil producer in the world. In particular, fluctuations in oil and gas prices can have a significant impact on companies' production costs. Furthermore, the introduction of a mandatory value-added tax in 2018 in Saudi Arabia is expected to influence the performance of Saudi industrial companies. Additionally, considerations related to the 2030 vision, which is integral to economic transformations, should not be overlooked when assessing firm performance. These economic factors could wield a substantial influence on firm performance, transcending the impact of the corporate governance structure of individual firms.

6. Conclusion

This study examines the influence of the recently introduced SCGC on the performance of listed industrial Saudi companies. Additionally, we consider the effect of the size and independence of the board of directors, audit committee features (size, frequency of meetings, and independence), and ownership concentration.

For this purpose, we use a multiple linear regression (fixed effect) based on panel data covering two periods: Before the implementation of the SCGC (2012-2016) and after this event (2017-2020). We utilize two accounting indicators to assess firm performance, especially ROA and ROE. Concerning the theoretical framework, the main hypotheses developed in this research are in the light of agency theory, the corporate governance approach, and previous literature, especially conducted in KSA.

The main results indicate the relatively positive effect of the new regulation SCGC on Saudi firm performance. We find a significant improvement in firm performance only when performance is measured by ROA. This verdict shows a serious need for more powerful regulatory efforts from the Saudi government to align with the SCGC provisions. Neither the size of the board of directors nor the size of the audit committee has a positive impact on firm performance. Thus, we believe that Saudi companies are interested in reducing the size of their boards and audit committees to ensure more operational effectiveness. Additionally, our results do not support the idea that frequent meetings with audit committees enhance firm performance in the KSA. Therefore, it would be interesting to review the minimum number of meetings (four meetings per year) provided in the SCGC or to emphasize the profile of members of the audit committee (skills and

expertise in accounting and finance). In fact, we record an increase in firm performance with the percentage of independent members on the board of directors and in the audit committee. Similarly, we show that firms with concentrated ownership outperform other firms with dispersed ownership in the Saudi context. This result indicates that the most powerful role could ensure the importance of supervising shareholders in KSA.

This study has several theoretical and practical implications that can be addressed by legislative policymakers, managerial decision-makers, and the research community. First, we note the added value of SCGC, especially provisions linked to the structure of the board of directors and the audit committee in the Saudi context. Companies must be meticulous not only in their selection of the members of the audit committee and board of directors but also in deciding the optimum number of these members and the periodicity of their meetings. Second, the limited effect of SCGC on the improvement of firm performance could provide insights for legislative powers, mainly the Saudi Capital Market Authority and SOCPA, about actions required to ensure more compliance with the provisions of SCGC. Moreover, we estimate that the majority of SCGC recommendations draw inspiration from international good governance practices, particularly those of the United States. This full alignment may lead to relative incongruity with the socioeconomic specificities of the Saudi context. Considering the substantial influence of Sharia on the daily lives of Saudi citizens, we believe that incorporating certain governance practices inspired by Sharia, in line with Saudi Arabia as an Arabic Muslim country, could secure more acceptance and alignment by companies with the provisions of SCGC.

Hence, we think that the dilemma for policymakers lies in their ability to adopt foreign best governance practices, which are necessary for attracting external investors (a goal emphasized by Vision 2030) while simultaneously preserving Saudi Islamic identity.

Finally, this study contributes to the scarcity of literature on the benefits of SCGC in Saudi Arabia. On the other hand, we notice that few studies have covered this topic in Saudi Arabia. However, most of these studies are descriptive and lack the use of empirical or statistical methods.

Despite the aforementioned implications, our research has certain limitations, primarily related to the measure retained for firm performance. The generalizability of the results is contingent on the reliability of the accounting indicators of firm performance. The potential impact of earnings management on the accuracy of these measures must be considered. For future research, it may be valuable to consider financial performance, such as Tobin's Q. Another limitation of this study is related to the sample size, which cannot be representative of all listed firms in KSA, thereby limiting the external validity of our results. Furthermore, the promulgation of SCGC coincided with the implementation of IFRS in KSA in 2017. Therefore, attributing any improvements in firm performance solely to the promulgation of SCGC may be doubtful. Future research could focus on the combined influence of these two events on the performance of listed Saudi firms. In the same perspective, we should underline that our sample may not account for sector-specific factors influencing corporate governance. In fact, we consider only industrial Saudi-listed firms in our sample, and we suggest future research to explore the impact of corporate governance in different sectors with a comparison between these sectors.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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