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**Article**

## Governance practices and corporate performance: Assessing the competence of principal-based guidelines

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# Governance practices and corporate performance: Assessing the competence of principal-based guidelines

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## ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

# Governance practices and corporate performance: Assessing the competence of principal-based guidelines

Marwan Mansour<sup>1</sup>, Hafiza Aishah Hashim<sup>1</sup>, Zalailah Salleh<sup>1</sup>, Waleed M. Al-ahdal<sup>1</sup>, Faozi A. Almqatari<sup>1,2\*</sup> and Murad Abdulsalam Qamhan<sup>3</sup>

**Abstract:** This study aims to investigate the relationship between corporate governance (CG) compliance and corporate performance in Jordan. We develop a corporate governance index (CGI) and investigate its impact on firms' performance. The index consists of 32 unique internal governance attributes that were built based on Jordanian governance Code. This study used a quantitative research method using panel dataset analysis of 672-firm year observations. Fixed effects regression model was employed to analyse the governance-performance nexus. To infer correctly, we re-examine the main analysis using a well-developed dynamic generalized method of moments (GMM) estimator to overcome possible endogeneity concerns. Consistent with prior studies in developed and developing countries in the governance literature, our findings robustly disclose that compliance with CG guidelines is a determinant of corporate performance of listed firms in Amman Stock Exchange (ASE) during period 2009–2016. The results indicate that a better degree of compliance with the Jordanian code and guidelines is positively and significantly related with better performance of publicly listed firms. This study contributes theoretically and practically to growing but under-developed literature



Marwan Mansour

### ABOUT THE AUTHOR

Marwan Mansour, is an independent researcher. He obtained his Ph.D. in Accounting from University Malaysia Terengganu (UMT). His research interests include financial accounting, corporate finance, corporate governance, and corporate social responsibility.

### PUBLIC INTEREST STATEMENT

Jordan's corporate governance system is relatively new to the Jordanian environment, and the capital market is viewed not as broad and deep as in developed ones. Emerging markets differ widely among themselves due to the cultural, economic, and political systems. Until now, studies have found mixed findings that differ across countries, industries, and firms. Most corporate governance mechanisms are complementary and can act as substitutes for each other. This study relies on internal corporate governance mechanisms that play a more vital role. It depends on a holistic approach to quantify and assess compliance with Jordanian corporate governance codes and guidelines. This research provides introspective insights into corporate governance. It has several implications for regulators and policymakers to revise the existing regulations of corporate governance and increase the disclosure and compliance levels in these regulations.

on governance compliance and corporate performance in developing countries. Therefore, this research has useful implications for developing countries, stock market authorities, policymakers, firms' directors, and academicians.

**Subjects: Governance; Accounting; Corporate Governance**

**Keywords: Market share; firms' performance; corporate governance index; Jordan**

## 1. Introduction

In the aftermath of high-profile financial scandals, regulatory bodies globally persist in reshaping CG codes and guidelines that aim to improve CG systems' imperfection (Aggarwal et al., 2019). Accordingly, CG codes have been highlighted as a remedy for business misconduct (H.A. Hashim & Ibrahim, 2013; Tanjung, 2020; Tariq & Abbas, 2013). According to Cuomo et al. (2015), national CG codes and recommendations become a popular means of encouraging corporations to surge accountability and transparency. Moreover, many researchers (Akbar et al., 2016; Bhatt et al., 2017; Wahyudin et al., 2017) asserted that when firms adhere to CG codes and guidelines not only abide by regulations and laws but also boost their outcomes by enhancing competence in controlling managerial activities. So, the objectives of complying with CG codes and guidelines is to protect shareholder rights, decrease agency costs and increase corporate performance. This is consistent with agency theory as described by Jensen and Meckling (1976). Surprisingly, to date, there remains a clear lag between the creation, revision, and reform of codes for CG and research into this area, especially in developing countries (Cuomo et al., 2015).

It is worthwhile noting that market share performs better than other traditional performance measures due to the following merits: first, it is less affected by accounting methods and practices (Alabdullah, 2018) which measured by net sales divided by the total sales of the industry (Ghazali, 2010). Thus, market share measurement did not rely on the expense, which represents the essence of accounting methods and practices, which may be highly exposed to opportunistic managerial behaviours. Second, a market share represents a core operational performance measure, which defines a broader conceptualisation of organisational performance via converging on factors that finally lead to corporate financial performance (Murphy et al., 1996). Third, market share considers the strategic goals of firms (Ittner et al., 1997) by showing firm market competitiveness (Ghazali, 2010; Varshney et al., 2012). Therefore, Buzzell et al. (1975) stated that market share is considered one of the significant determinants of business profitability and corporate performance.

Unlike prior studies in developing countries (e.g., Al-Malkawi et al., 2014; Shahwan, 2015) and especially in Jordan (e.g., Alabdullah, 2018; Alodat et al., 2021; Suwaidan et al., 2013), this study explicitly deals with endogeneity problems posed by the relationship between CG-performance to infer correctly. Also, the study's period is unique because it covers all years before the second reforming governance guidelines. The Jordanian Governance Code can be implemented voluntarily by firms under the "Comply or explain approach," avoiding high costs of immediate and fast implementation of the national Code (Haddad et al., 2017). This flexibility has expected to create a steep difference along with compliance gaps among firms. Thus, this study's timeframe offers a perfect opportunity to study the effect of a complete cycle of voluntary guidelines fulfilment. In addition, this period was marked by significant reforms by issuing the first Code of CG in 2009. Jordan Securities Commission (JSC) intervenes when firms had suffered from problems and challenges on their performance and prevented other mal-management forms (Alabdullah, 2018; Alodat et al., 2021). It is rational that firms' performance under a principles-based approach and unstable circumstances be assessed to see how the "pros and cons" of soft laws could have influenced listed firms' performance. Then, as new mandatory provisions are coming into effect in 2017 (Haddad et al., 2017), lessons on how the earlier voluntary guidelines were practical can be decisive.

Therefore, this study examines the relationship between corporate governance (CG) compliance and corporate performance in Jordan, which contributes to the strand literature in several ways. First, this research utilizes market share as a novel measure of corporate performance in governance literature. Following Agarwal et al. (2003), Alabdullah (2018), Mitchell (1991), and Murphy et al. (1996) who indicate that market share is one of the most important metrics to measure corporate operating performance, the present study used market share as a measure for corporate performance. Second, the study used non-financial firms listed in Aman Stock Exchange (ASE) and comprehensive data on firm-level CGI collected directly from firm annual reports. Third, this study offers further insights into the objectivity of contradictory performance measures. This study contributes to CG literature by exploring the CGI-performance nexus in the Jordanian settings depending on market share as a novel measure of corporate performance. Finally, this study provides the full impression of a CG cycle confirming that the recent interventions in 2017 by JSC through imposing mandatory guidelines are a step in the right direction. Thus, this study investigates the effects of CG practices enacted by JSC in 2009 as becoming an essential part of the ASE rules on Jordanian-listed firms' performance for the past eight years of the mandatory guidelines' presence and using panel data of 672-firm year's observations obtained from the annual reports of the 84 non-financial listed firms between 2009 and 2016. We find that the compliance level of CG has increased since the issuance of soft law's guidelines in 2009. After controlling firm size, firm age, sales growth, and leverage, we find a significant positive impact of CG guidelines on corporate operating performance. In addition, we assure that findings are rigorous to endogeneity concerns.

The remaining part of the paper proceeds as follows: Section 2 provides the conceptual framework, section 3 is devoted to presenting the literature review and development of the hypothesis. Then, section 4, is concerned with the methodology employed for this study and the measurement of the variables of interest. We then report the data analyses and discuss the empirical results in section 5. Finally, section 6 draws some conclusions regarding the future directions for this research topic.

## 2. Conceptual framework

Considerable attempts have been made to explain CG, and substantial studies have been undertaken to investigate the relationship between CG and corporate performance. Most studies, however, have focused extensively on investigating this relationship in developed countries (e.g., Brown & Caylor, 2009; Gompers et al., 2003; Renders et al., 2010). Consequently, CG and institutions in developed countries are dissimilar to those in developing countries. Thus, the earlier findings cannot be generalised to firms and markets in different institutional settings (Elsayed, 2011; H.A. Hashim & Ibrahim, 2013). Generally, the CG system is considered relatively new to the Jordanian environment, and the capital market is viewed not as broad and deep as in developed ones. Outa and Waweru (2016) argued that emerging markets also differ widely among themselves due to the cultural, economic, and political systems, hence the need for country-specific governance studies (Love, 2011), to realise ultimately which CG mechanisms are significant for which kinds of firms and in which types of settings.

Until now, studies have found mixed findings that differ across countries, industries, and firms. While Brown and Caylor (2009), Gompers et al. (2003), and Renders et al. (2010) empirically concluded that good governance leads to superior corporate performance in developed markets. Akbar et al. (2016) did not find any relationship between compliance with CG regulations in the UK and corporate performance. In a different vein, Bhatt et al. (2017) found a clear relationship between CG code effects on the listed firms' performance in Malaysia. In the Middle East and North Africa (MENA) countries, including Jordan, Sarhan et al. (2019) reported that CG mechanisms positively affect corporate performance. In the Jordan frontier, Alabdullah (2018) and Saidat et al. (2019) found contradictory results regarding the effect of few CG mechanisms on firms' performance.

Studies (e.g., Cuomo et al., 2016; Peris et al., 2017; Saini & Singhanian, 2018) stated that mixed results in CG literature might be partially attributed to the differences in sample size, sector, period,

methodologies, and countries which these studies were conducted. Besides, a possible critical explanation that the relationship between most CG mechanisms is complementary (Al Amosh & Khatib, 2021; Elsayed, 2011) and can act as substitutes for one another (Cheung et al., 2011). Thus, using single or few mechanisms to test this relationship may not always be the correct choice (Brown et al., 2011).

Another explanation for mixed results is “potential measurement bias” due to a wide variety in the choice of performance metrics among studies (Bozec et al., 2010; Shank et al., 2013). While some researchers (Alabdullah, 2018; Ciftci et al., 2019) highlight limitations on the usage of accounting-based performance measures (e.g., Return on Assets), as they may be subject to changes in accounting methods and practices (e.g., depreciation) and management manipulation (e.g., income smoothing). Others have criticised market-based performance measures (e.g., Tobin’s Q). They may be vulnerable to investor anticipation and manipulated by insiders, which is perhaps inefficient in under-developing capital markets (Bozec et al., 2010; Tariq & Abbas, 2013). Thus, there is dissatisfaction with using financial measures (accounting and market) to assess CG literature’s corporate performance (Bozec et al., 2010; Eccles, 1991). To date, the debate continues regarding adequate corporate performance measurement, which has commanded little consensus on the best approach (Elsayed, 2011).

Hence, this lack of consensus creates an opportunity to conduct an in-depth study to tackle these methodological aspects (Bozec et al., 2010). Thus, this study varies from earlier studies in four respects to settling the lack of consensus regarding the governance–performance nexus. First, we rely on a holistic approach to quantify and assess the range of compliance with Jordanian CG codes and guidelines by developing a suitable CGI for developing countries which derived from an internationally accepted set of governance principles. Such an index is valuable because it integrates much more internal governance mechanisms into a single value (Almaskati et al., 2020; Chauhan et al., 2016). This fundamental logic is parallel to that suggested by Akbar et al. (2016), Brown and Caylor (2006, 2009) and Gompers et al. (2003). This study relies on internal CG mechanisms that play a more vital role in the absence of solid outside institutions and competent law enforcement in developing countries (Ararat et al., 2021). One criticism of most prior studies is that the scholars use governance indices (e.g., G-Index or E-Index) that are suitable for advanced markets (Cheung et al., 2011). As such, those indices have little applicability in different institutional settings.

However, there are very few studies that used a composite measure of governance based on panel data to evaluate these guidelines and explore its influence on corporate performance in Jordanian setting. This present study is looking forward to filling that theoretical and practical gap. Second, this study utilised the market share as a powerful technique to measure corporate performance that avoids traditional performance measures’ shortfalls. According to the stakeholder approach, corporate performance is judged mainly by market share metrics (Mayer, 1997). Thus, one of this paper’s contributions is that it depends on market share as a novel measure of corporate performance in governance literature. To the researchers’ knowledge, no earlier study has studied corporate governance indices in such an association. Market share had always been selected to measure corporate performance but not in the field of CG indices. Furthermore, Agarwal et al. (2003), Alabdullah (2018), Mitchell (1991), and Murphy et al. (1996) highlights that market share is one of the most important metrics to measure corporate operating performance.

### **3. Literature review and development of hypothesis**

#### **3.1. Corporate governance and corporate performance**

The literature on agency conflicts argued that the managers have divergent goals than owners and will act in their own best interest whenever they have the opportunity (Al Amosh et al., 2022; Jensen and Meckling (1976)). Typically these opportunistic behaviours are conducted at the expense of shareholders’ wealth. Such chances are more incidence to surface in firms with

a weak CG framework, distinguished by the absence of efficient monitoring and controlling mechanisms. Firm managers are more likely to adopt non-productive activities such as shirking and empire-building and sub-optimal strategies, expropriate firm resources, and manipulate financial results (Love, 2011). Thus, these firms generally exhibit severe underperformance (Renders et al., 2010). By implementation of good CG practices, firms can diminish agency costs and restrict these opportunistic behaviours. Hence, boost corporate performance (Akbar et al., 2016). From the agency theory perspective, this study expects to find a positive association between corporate performance and CGI, which we ply as a proxy for good CG practices.

Although agency theory literature points out that good governance practices could reduce agency costs and enhance corporate performance, prior empirical results are mixed. Hence, there is no consensus among scholars on the strength and direction of the association. A possible explanation for this is that the disparities in the results are due to the variety of CG mechanisms and corporate performance metrics adopted by researchers (Sami et al., 2011; Shank et al., 2013). The diverse results in the literature suggest that an evaluation of CG based on specific mechanisms might not demonstrate the same effect as one based on the composite measurement of CG (Brown et al., 2011).

Broadly, two kinds of approaches adopted in previous studies. The first approach uses a holistic approach by using CG indices. The second approach focuses on specific CG mechanisms, such as board characteristics or ownership structure and others (e.g., H. A. Hashim & Amrah, 2016; Ciftci et al., 2019; Elsayed, 2011). Because this study focuses on a holistic approach using CG indices, in the literature review, we debate only the related studies with composite CG measures. Several studies have indicated that identifying any relationship between individual CG mechanisms and performance is not clearly evident or is difficult to prove, especially when only one measure is utilised (Almaskati et al., 2020), which leaves other governance mechanisms in the shade.

Additionally, Larcker et al. (2007) confirm that the use of multiple CG mechanisms can lessen the measurement error related to a single mechanism. So, theoretically, an index comprised of many measures has the potential to shed more light on the relationship between CG and corporate performance (Almaskati et al., 2020). A CGI or rating's main objective is to assess, using an overall score, how well firms adhere to and apply the CG code provisions imposed by regulatory bodies (Akbar et al., 2016).

As far as developed countries are concerned, a lot of work has been devoted to analysing the CG-performance nexus (e.g., Akbar et al., 2016; Bozec et al., 2010; Brown & Caylor, 2006, 2009; Epps & Cereola, 2008; Gompers et al., 2003; Larcker et al., 2007; Renders et al., 2010). However, these studies show divergent views. In US settings, Gompers et al. (2003) find a solid relationship between better-governed firms (based on the anti-takeover index) and Tobin's Q as a forward-looking performance measure. Still, they did not find an index to be an essential factor in interpreting the returns on equity as an indicator of firms operating performance. In contrast, Larcker et al. (2007) find only a weak and mixed association between CG ratings and market value. Epps and Cereola (2008) also found no statistical evidence confirming that return on assets is related to the CG rating using firms listed on the S&P 500.

In contrast, Bhagat and Bolton (2008) found a positive correlation between several governance indices, contemporaneous and subsequent operating performance measured by ROA ratio. Still, the statistically insignificant correlation with the (stock market) performance or Tobin's Q. Brown and Caylor (2006) finds strong evidence of a relationship between governance score and Tobin's Q. Also, Brown and Caylor (2009) indicate a positive association between commercial ratings of governance and firms' performance (ROE and ROA). Contrary to this, Daines et al. (2010) find no dependable relationship between several commercial ratings and performance measures (ROA and Tobin's Q). However, these studies' mixed findings cast doubt on the notion of a direct and universal relationship between CG mechanisms and performance.

International evidence by Ammann et al. (2011) detected a strong and positive relationship between firm-level CG and Tobin's Q for 22 developed countries. A Cross-European study by Renders et al. (2010) finds a significant and positive correlation between CG ratings and performance (Tobin's Q, market-to-sales ratio, market-to-book value, ROA, ROE) after controlling for selection bias and endogeneity. In contrast, Akbar et al. (2016) find no significant confirmation to compliance with good CG practices leads to progress in firms' performance (Tobin's Q and ROA) after controlling for endogeneity.

Regarding developing countries, Black (2001) concluded that there was a strong positive correlation between CG rankings with the market value of Russian firms. Similarly, across 14 emerging markets, Klapper and Love (2004) find that better CG rankings are highly correlated with better operating performance (ROA) and market valuation (Tobin's Q), and this depends on legal environment in these countries. Moreover, other studies, such as Abdallah and Ismail (2017), Bhatt et al. (2017), have emphasised that CG indices have a positive impact on firm performance. Recent evidence from India and Gulf Corporation Council countries uncovers that the board accountability index and audit committee index have an insignificant effect on firms' ROE and Tobin's Q (Al-ahdal et al., 2020). Similarly, the transparency and disclosure index has an insignificant negative impact on Tobin's Q.

As is well known, the results of antecedent empirical studies are mixed. These results point to heterogeneity in CG quality across countries. Therefore, an optimal CG system for all countries and all firms does not exist (Abdallah & Ismail, 2017). Thus, it is not plausible to depend on a "closed-system" approach of CG that assumes a universal set of relations between CG and corporate performance and pays little consideration to the different environments in which firms operate. Accordingly, it has been emphasised that good governance practices are not often universal (one size mostly fits all) but rather depend strongly on each country's attitudes (settings). Further, each firm's characteristics justifies applying the "open-system" perspective to expand our understanding of surrounding environmental factors (Brown et al., 2011). More so, there is dissatisfaction with using financial measures to assess business performance (Bozec et al., 2010; Eccles, 1991), and the debate continues about the adequate measurement of corporate performance (Alabdullah, 2018; Tariq & Abbas, 2013), which has commanded little consensus on the best approach (Elsayed, 2011).

Overall, developing countries face different matters from those experienced in developed countries (Bhatt et al., 2017). Thus, firms that work in a weak legal environment may want to distinguish themselves in the market to signal their quality by adopting good governance practices (Renders et al., 2010; Tanjung, 2020). While considering CG regulation, it is anticipated that firms' compliance with CG recommendations assumes the protection of shareholders' rights. Also, the main objective of complying with the Jordanian guidelines of CG is to decrease agency costs and increase the performance of publicly listed firms. Therefore, grounded to agency theory and based on the above literature review and the critical research questions mentioned above, the following hypothesis is proposed:

Hypothesis 1 (H1): The CG compliance effect on corporate performance in the Jordanian non-financial sector is significant and positive.

## 4. Research methods

### 4.1. Data

To achieve the current study's objectives, Jordan is selected because it is considered one of the most stable, safety and competing countries in the Middle East region (Alabdullah, 2018). Jordan holds ninth place behind the Gulf countries, Tunisia and Morocco, in its international business climate ranking in the Arab world according to Doing Business Report 2013 (Haddad et al., 2017). This contributes to a large degree in attracting foreign investors to invest in the Jordanian market (Saidat et al., 2019; Suwaidan et al., 2013). Also, ASE is an inspiring choice for the study since the findings could also be relevant for other developing economies, especially the Arab ones.



The study spans whole population of Jordanian-listed firms at ASE for period 2009–2016. In 2016, total listed firms were 214. Financial firms (102 firms) in accordance with prior studies are excluded from our initial sample since their financial structure is different from other non-financial firms and they are often subject to different rules and recommendations (Sarhan et al., 2019), which make financial firms incomparable with those of other non-financial firms (Saidat et al., 2019). We also excluded firms (28 firms) that had missing or unbalanced data for the entire period covered. To this end, final sample consisted of a panel data set for 84 non-financial firms (41 industrial and 43 service firms) which was used to examine the empirical model (representing 75% of the sample to non-financial firms), during a period of 8 years from 2009 to 2016, which produced 672 observations. It is worth noting that non-financial firms play an increasingly important part in Jordan's economy. These sectors contribute 73% of Jordan's gross domestic product (Haddad et al., 2017). The relevant data are drawn from a diversity of sources, comprising annual firms' reports, ASE and Securities Depository Center (SDC) database. Thus, the data collected for the years under study were considered sufficient to serve the purpose of the study and to have resulted in a balanced panel data set.

#### 4.2. Methodology

A regression model is a valuable tool that states whether the explanatory variables have a notable influence on explained variables or not. It also determines the proportion of change in the explained variables, which is attributable to explanatory variables (Al-ahdal et al., 2020). Before running the main regression analysis, a preliminary data analysis was performed to check some assumptions of multivariate analysis for screening and preparing data (Qamhan et al., 2018). To improve independence and linearity, this study performed a procedure to detect and eliminate outliers and influential observations. For this purpose, the study employed the Mahalanobis Distance Measure, the result of which revealed some outlying observations. To deal with this issue, variables with extreme values were winsorised at the 5th and 95th percentiles to restrict the power of outliers. Also, by using the Breusch–Pagan/Cook–Weisberg test along with the Wooldridge test, this study detected heteroscedasticity and autocorrelation problems in the model fitted. Therefore, this study decided to use the Driscoll–Kraay covariance matrix estimator to adjust standard errors and thereby address this problem to ensure correct estimates for the significance of the variables (Hoechle, 2007). These results also justified employing panel data analysis techniques rather than ordinary least squares (OLS) estimators. For the final sample, this study obtained 672 firm-year observations. To examine the impact of the CGI on the corporate performance of Jordanian non-financial listed firms, panel regression models were engaged to enrich the practical analysis (Gujarati, 2009). So, a performance indicator for the non-financial firm was considered, namely, M. Share, which is can be used as response variables (Agarwal et al., 2003; Alabdullah, 2018; Mitchell, 1991; Murphy et al., 1996). Also, in order to capture the firm's-level of governance compliance, this study constructs governance index as the main explanatory variable of interest, CGI. Here, the model contained relevant control variables (LEV, SIZE, AGE, GROWTH, M/B, and YEAR dummy variables) that could possibly confound the governance-performance nexus. The model for the analyses is devised as follows:

$$\text{Performance}_t = \beta_0 + \beta_1 \text{CGI}_t + \beta_2 \text{LEV}_t + \beta_3 \text{SIZE}_t + \beta_4 \text{AGE}_t + \beta_5 \text{GROWTH}_t + \beta_6 \text{M/B}_t + \text{YEAR}_t + \epsilon_{i,t}$$

Hausman test was carried out to differentiate between the random and fixed-effects models (Bhatt et al., 2017). The significant results for a p-value of less than 0.05 suggested that the assumptions for the random-effects estimation were violated in favour of fixed effects which was more consistent and efficient to run the regression model.

#### 4.3. Operational definition and measurement of the variables

##### 4.3.1. Measuring CGI

Consistent with prior literature (e.g., Akbar et al., 2016; Tanjung, 2020), this paper does not consider all of the Jordanian CG Code. However, 32 unique internal attributes were carefully chosen to construct a CGI for assessing the study sample's level of compliance. Notably, the Jordanian Code of CG has represented primarily global good governance practices because it

rooted in the OECD guidelines of governance as most developing countries (Haddad et al., 2017). This proposed code also reviewed by experts from OECD and the World Bank as part of its project (McGee, 2009). Consequently, an index contains the most-cited unique governance mechanisms from the most-cited studies, which are suitable for developing countries, as seen in Table 1. The index is well matched with Jordanian governance Code and reflects local firms, norms, and data availability. Accordingly, the CGI comprised 32 unique internal attributes, which had been extracted as follows: 15 attributes devoted to disclosure and transparency; nine attributes devoted to board effectiveness and composition; and eight attributes devoted to shareholder rights. The 32 characteristics of the CGI are summarised in Table 1:

The JSC does not enforce listed firms to prepare separate CG reports. Thus, this study depended on the governance information disclosed from annual reports of each firm to build a governance index. Ammann et al. (2011) claimed a positive tie-up between the likelihood of a firm disclosing information on a specific governance attribute and an attribute being adopted by the firm. So, data collected for 32 governance attributes individually, then all these governance attributes were modified into a binary scale (taking a value of 1 or 0). The value of (1) denoted that firms comply with the feature designated, while (0) refer to non-compliance. Many scholars (e.g., H. A. Hashim & Amrah, 2016; Akbar et al., 2016; Al-Malkawi et al., 2014; B. S. Black et al., 2014) indicated using a dichotomous measure in constructing the CG indices considered an excellent approach in research that intends to assess compliance scores.

In line with Mansour et al. (2020) and Tanjung (2020), we used an un-weighted approach for scoring a CGI to eliminate the risk of subjectivity. Bhagat et al. (2008) assured that an unweighted method is considered suitable for examining a comply-or-explain regime. In the current study, each firm's overall CGI was calculated based on equally weighted scores for the 32 attributes. Consequently, the maximum achievable score was 32, which indicated full compliance (100%). The numeric score for each firm was converted to a percentage based on the maximum score. Specifically, the total score of compliance for a firm in a year is equal to the actual score obtained by that year to the maximum possible scoring (32).

In developing countries, the external mechanisms of CG, such as takeover markets, labour markets, and product markets are unproductive or ineffective thus it can be considered less active to governing top management in these environments (Siddiqui, 2015). The main internal CG mechanism, such as the board of directors, are widely used, which considered productive, dependable and effective in governing and monitoring top management in developed and developing countries (Young et al., 2008). Thus, this study employed the internal governance attributes to build a CGI.

**4.3.1.1. Reliability and validity of CGI.** This study dealt with the reliability and validity of built CGI to possess a high degree of consistency and stability by undertaking four main steps: First, following Samaha et al. (2012), the reliability of the CGI was initially assessed as follows: each of the annual reports of the firms in the sample was read in its entirety, twice. The ratings of the index for each firm were calculated twice to obtain a similar rate both times. However, if there are any differences in the score between the first and second round, the firm's ratings should be subjected to a third and final evaluation. Second, the second coder asked to confirm an index's reliability by checking the principal researcher's initial coding to ensure accuracy and consistency. Third, the content validity was scrutinised by evaluating all attributes included (Al-Malkawi et al., 2014) through reviewing these attributes in the literature above, as shown in Table 1.

Finally, the CGI reliability was evaluated by carrying out a Cronbach's alpha test to measure the interrelationship between all attributes that composed the index's components (Shahwan, 2015). This test is considered apt, particularly when dichotomous items are used because it enables evaluating each attribute's internal consistency within the index (B. Black et al., 2017). According to Ararat et al. (2017), a high alpha value indicates that an index has high reliability. In this study,

**Table 1. Corporate governance index \***

| <b>A.</b> | <b>Disclosure and Transparency:</b>  | <b>References:</b>  |
|-----------|--|---|
| 1.        | Firms have a website to disclose related financial information   | (Al-ahdal et al., 2020; Ararat et al., 2017; Al-Malkawi et al., 2014)                               |
| 2.        | The availability of the firm's annual reports to the public  | (Al-ahdal et al., 2020; Al-Malkawi et al., 2014; B. S. Black et al., 2014).                         |
| 3.        | The firm reports comply with the IFRS  | (B. S. Black et al., 2014; Hodgson et al., 2011; Del Carmen Briano-Turrent & Rodríguez-Ariza, 2016) |
| 4.        | Firms disclosed their annual reports in the English language   | (Abdallah & Ismail, 2017; Del Carmen Briano-Turrent & Rodríguez-Ariza, 2016)                        |
| 5.        | The firm employs one of the well-known Big-4 auditor firms   | (Al-Malkawi et al., 2014; Shahwan, 2015)  |
| 6.        | Is the auditor's report clean?   | (Ammann et al., 2011)   |
| 7.        | Do the annual reports specify any potential conflicts of interest like issues regarding the related party transactions | (Al-Malkawi et al., 2014; B. S. Black et al., 2014; Hodgson et al., 2011)                           |
| 8.        | The firm provides details (report) on the corporate social responsibility  | (Al-ahdal et al., 2020; Al-Malkawi et al., 2014; Samaha et al., 2012).                              |
| 9.        | The firm reveal the benefits and remuneration of the board members   | (Hodgson et al., 2011; Shahwan, 2015)   |
| 10.       | The firm reveals the benefits and remuneration of the Senior Executive Management                                      | (Samaha et al., 2012; Shahwan, 2015)  |
| 11.       | The firm reveals the qualifications of the Senior Executive Management   | (Samaha et al., 2012)   |
| 12.       | Information related to risk management is available in the annual report   | (Al-Malkawi et al., 2014; Hodgson et al., 2011; Samaha et al., 2012)                                |
| 13.       | The firm has a corporate governance report   | (B. S. Black et al., 2014; Hodgson et al., 2011; Del Carmen Briano-Turrent & Rodríguez-Ariza, 2016) |
| 14.       | The firm provides details about the credit rating  | (Al-Malkawi et al., 2014; Hodgson et al., 2011)   |
| 15.       | Availability of details relating board of directors' meetings (Board activity) and attendance                          | (B. S. Black et al., 2014; Hodgson et al., 2011)  |
| <b>B.</b> | <b>Board Effectiveness and Composition:</b>  |   |
| 16.       | The CEO and board chairman are different persons   | (Akbar et al., 2016; Renders et al., 2010)  |
| 17.       | The firm has an audit committee  | (Al-Malkawi et al., 2014), (SALLEH et al., 2022)  |
| 18.       | The firm has a nomination committee, a remuneration committee  | (Love, 2011)  |
| 19.       | The firm has at majority non-executive directors   | (Akbar et al., 2016; B. S. Black et al., 2014; Samaha et al., 2012; Shahwan, 2015)                  |
| 20.       | The board size is between 5-13   | (Hodgson et al., 2011)  |
| 21.       | The firm has revealed qualifications of the board members in the annual report   | (B. S. Black et al., 2014; Hodgson et al., 2011; Samaha et al., 2012)                               |
| 22.       | Has the firm revealed the shares owned by directors' members   | (Al-Malkawi et al., 2014; Bhagat & Bolton, 2013)  |
| 23.       | Has the firm revealed the shares owned by Senior Executive Management  | (Del Carmen Briano-Turrent & Rodríguez-Ariza, 2016)   |
| 24.       | Do independent directors form 1/3 of the total   | (Hodgson et al., 2011; Shahwan, 2015)   |

(Continued)

**Table 1. (Continued)**

| C.  | Shareholders' Rights:  |   |
|-----|--|---|
| 25. | Offering the detailed information about the shareholders on firm's website and/or ASE website                          | (Hodgson et al., 2011; B. S. Black et al., 2014; Shahwan, 2015) |
| 26. | Providing reports of the shareholders' meetings  | (Hodgson et al., 2011)  |
| 27. | Availability of the national and foreign shareholding percentage on the firm's website and/or financial market website | (Al-Malkawi et al., 2014; Sami et al., 2011)                    |
| 28. | Availability of authorised percentage of shareholdings by foreign shareholding   | (Al-Malkawi et al., 2014; Sami et al., 2011)                    |
| 29. | The firm permits cumulative voting for the election of directors   | (Aggarwal et al., 2019; Al-Malkawi et al., 2014)                |
| 30. | The firm has complaint options   | (Aggarwal et al., 2019; Al-Malkawi et al., 2014)                |
| 31. | The dividend declarations are available to shareholders  | (Al-Malkawi et al., 2014; Hodgson et al., 2011)                 |
| 32. | The market price of share is available to shareholders   | (Al-Malkawi et al., 2014; Hodgson et al., 2011)                 |

●The results of Cronbach's Alpha test is 0.759

\*All standards are voluntarily adopted in non-financial firms.

the Alpha value was 0.759, which represented an acceptable internal consistency level and confirmed that the CGI is valid for use.

#### 4.3.2. Measuring corporate performance

As argued above, there is dissatisfaction with using traditional measures to assess CG literature's corporate performance due to it suffered from measurement bias (Bozec et al., 2010). Thus, we controlled for a potential measurement bias; market share has been selected as a powerful technique to measure corporate performance, avoiding other measures' shortfalls.

According to Murphy et al. (1996), market share signifies a core operational performance measure, which defines a broader conceptualisation of organisational performance via converging on factors that finally lead to corporate financial performance. In line with previous studies, market share is measured by the ratio of a firm's sales to the firms' total sales in a similar industry sector (Alabdullah, 2018; Balasubramanian et al., 2010; Ghazali, 2010).

#### 4.3.3. Measuring control variables

As in the previous literature, some firm-specific variables were considered as control variables. That can affect corporate performance, namely, leverage (SALLEH et al., 2022; Abidin et al. 2017), firm size (Al Amosh & Khatib, 2022; Saleh et al., 2021; SALLEH et al., 2022), firm age (Tanjung, 2020), sales growth (Akbar et al., 2016), Market to Book Ratio of equity (Abdallah & Ismail, 2017) and year effect (Almaskati et al., 2020). These variables can be used to control a firm's financial condition and to cancel any specification errors in the estimation (Shahwan, 2015). Thus, control variables are used to lessen the likely extent of omitted variable bias (Ararat et al., 2017).

### 5. Descriptive statistics and pearson correlation matrix

#### 5.1. Descriptive statistics

Table 3 presents descriptive statistics for the dependent variable, independent variable, and firm-specific heterogeneity, for full period under study (2009–2016) for the non-financial Jordanian

firms included in this study. The M. Share ranges from 0.04 to .626, with a mean of 0.173 and a standard deviation of 0.188. Table 3 also presents the values for skewness and kurtosis. These values indicate that the sample is normally distributed because the values are within the acceptable range of normality for both skewness and kurtosis (Alabdullah, 2018).

Moreover, Table 3 provides descriptive statistics for the constructed CGI. The index score ranges between 0.5 and 0.97, with a standard deviation of 0.08. This result indicates that there is little heterogeneity in governance compliance across the non-financial firms listed. This implies that firms in the sample only comply with 80% of voluntary provisions addressed in the CGI. Thus, non-financial sector offer different levels of protection to their investors because of their operational specificities and their motivation to voluntarily adopt good CG practices. It should be noted that the average percentage score of the CGI in the current study is close to some of the indices scores of other countries in the MENA region such as Oman and Saudi Arabia (Al-Malkawi et al., 2014). In addition, the score of the CGI in Jordan is higher than some studies in developed and developing counties, such as in Brazil which is 67%, in Malaysia 63.64%, in Bahrain 62%, in Qatar 67%, in Canada is 66.76%, in Turkey 46.73%, in South Africa 61% (Al-Malkawi et al., 2014; Berthelot et al., 2010; Bhatt et al., 2017; Lima & Sanvicente, 2013).

Table 3 also contains descriptive statistics for the control variables. These statistics indicate that there is a disparity in firm size and firm age among the study sample. In addition, the statistics indicate that the sales growth in non-financial firms in the Jordanian environment was low during the period of study, where the average M/B was 1.26%.

In relation to the above, the principle-based approach seems to have helped non-financial firms in Jordan to implement the code gradually as can be seen in Table 4, but there remains much room for improvement, the existence of a large number of foreign investors in the Jordanian

**Table 2. Operational measurement of variables**

| <b>Variables</b>               | <b>Acronym</b> | <b>Operationalisation</b>  |
|--------------------------------|----------------|--|
| <b>Dependent Variables:</b>    |                |  |
| Market Share                   | M. Share       | Measured by the ratio of a firms sales to the total sales of the firms in the same industry sector.          |
| <b>Independent Variables:</b>  |                |  |
| Corporate Governance Index     | CGI            | The self- constructed CGI consists of 32 attributes as a proxy of corporate compliance.                      |
| <b>Control Variables:</b>      |                |  |
| leverage                       | LEV            | Total Debt/Total Assets  |
| Firm size                      | SIZE           | Measured as the natural logarithm of total assets.   |
| Firm age                       | AGE            | Measured by the natural logarithm of the total number of years since a firm was established.                 |
| Sales growth                   | GROWTH         | Measured as the ratio of current year's sales minus previous year's sales, divided by previous year's sales. |
| Market to Book Ratio of equity | M/B            | Market Value/ Book Value per Share.  |
| Year Dummy                     | YEAR           | Year is a dummy variable to check the time effect or trend effects for years (from 2009 to 2016).            |

**Table 3. Descriptive statistics and normality test for the entire sample**

| Variables* | Obs. | Mean  | Std. Dev. | Minimum | Maximum | Skewness | Kurtosis |
|------------|------|-------|-----------|---------|---------|----------|----------|
| M. Share   | 672  | .173  | .188      | .04     | .626    | 1.155    | 3.1      |
| CGI        | 672  | .797  | .08       | .5      | .97     | -.465    | 2.875    |
| LEV        | 672  | .35   | .22       | .004    | 1.04    | .878     | 3.25     |
| SIZE       | 672  | 17.31 | 1.44      | 13.06   | 21.31   | .278     | 3.94     |
| AGE        | 672  | 2.95  | .69       | .693    | 4.38    | -.2      | 2.64     |
| GROWTH     | 672  | 0.14  | 0.2       | -.43    | 0.52    | 0.064    | 2.94     |
| M/B        | 672  | 1.26  | 0.82      | 0.34    | 3.29    | 1.1      | 3.23     |

Source: Authors' calculation. \*All variables are defined in Table 2.

**Table 4. Descriptive statistics of CGI by year**

| Year    | Obs. | Mean  | Std. Dev. | Min    | Max  |
|---------|------|-------|-----------|--------|------|
| 2009    | 84   | .75   | .086      | .5     | .925 |
| 2010    | 84   | .76   | .071      | .5     | .937 |
| 2011    | 84   | .76   | .07       | .59375 | .937 |
| 2012    | 84   | .77   | .072      | .59375 | .937 |
| 2013    | 84   | .78   | .075      | .59375 | .937 |
| 2014    | 84   | .8    | .084      | .59375 | .937 |
| 2015    | 84   | .85   | .062      | .59375 | .937 |
| 2016    | 84   | .86   | .061      | .625   | .97  |
| Overall | 672  | 0.797 |           |        |      |

Source: Authors' calculation.

market is considered an efficient part of CG enhancement (Saidat et al., 2019). Additionally, Boolaky et al. (2018) have reported that Jordan is look rapidly progressed in compliance with accounting standards and corporate governance code than other MENA countries based on international reports such as UNCTAD Report. From the above discussion, the improvement in adherence to the components in the CGI may be reflected in the enhancement of firm performance.

### 5.2. Pearson correlation matrix

Table 5 provides correlation matrix of the variables. From the table, the CGI scores are positively and significantly related with performance indicator at the 5% significance level or better. The correlation matrix reveals the absence of a multicollinearity problem between the research variables, because degree of correlation between the explanatory variables is less than the benchmark of 0.7 (Outa & Waweru, 2016). In addition, the results of the variance inflation factor (VIF) test are much lower than the threshold value of 10 (Alabdullah, 2018; Al-ahdal et al., 2020), which confirms that there is no severe multicollinearity fear among the explanatory variables (Saleh et al., 2021).

### 6. Results estimation- fixed effect model

This section clarifies main results which were drawn from the fixed-effects regression model. The main hypothesis of the study stated that there is a positive relationship between the CGI and corporate performance of Jordanian non-financial listed firms. As Table 6 shows, the regression model has significant explanatory power. The  $R^2$  (within) of the market share model is 0.698, while the F-statistic is 94.86 and is significant at 0.000. This indicates that this model is statistically valid. The  $R^2$  value indicates that the explanatory variables in this model explain 69.8% of variation in the market share of Jordanian non-financial listed firms. The results detect that the coefficient of CGI as a main explanatory factor is found to be positive and significant in predicting market share at ( $t = 2.65$ ,  $P < 0.01$ ), these in predicted positive direction, as revealed by estimated coefficient, and

**Table 5. Pearson correlation matrix and multicollinearity test of study variables**

| Variable  | M. Share          | CGI               | LEV               | SIZE               | AGE             | GROWTH             | M/B    |
|-----------|-------------------|-------------------|-------------------|--------------------|-----------------|--------------------|--------|
| M. SHARE  | 1.0000            |                   |                   |                    |                 |                    |        |
| CGI       | 0.3*<br>(0.0000)  | 1.0000            |                   |                    |                 |                    |        |
| LEV       | 0.21*<br>(0.0000) | 0.095**<br>(0.02) | 1.0000            |                    |                 |                    |        |
| SIZE      | 0.59*<br>(0.0000) | 0.46*<br>(0.0000) | 0.36*<br>(0.0000) | 1.0000             |                 |                    |        |
| AGE       | 0.13*<br>(0.001)  | 0.28*<br>(0.0000) | 0.1*<br>(0.01)    | 0.26*<br>(0.0000)  | 1.0000          |                    |        |
| GROWTH    | 0.08*<br>(0.046)  | 0.11*<br>(0.007)  | 0.036<br>(0.38)   | 0.092**<br>(0.025) | -0.06<br>(0.14) | 1.0000             |        |
| M/B       | 0.11*<br>(0.006)  | 0.23*<br>(0.0000) | 0.12*<br>(0.004)  | 0.18*<br>(0.0000)  | 0.04<br>(0.28)  | 0.166*<br>(0.0001) | 1.0000 |
| VIFs      | -                 | 1.95              | 1.19              | 1.62               | 1.13            | 1.13               | 1.14   |
| Tolerance | -                 | 0.512             | 0.842             | 0.617              | 0.882           | 0.884              | 0.877  |

All variables are defined in Table 2. Correlation is significant at the \* P < 0.01, \*\* P < 0.05, and \*\*\* P < 0.1 (2-tailed). VIF, variance inflation factor for explanatory variables.

this is in line with results Pearson correlation. Furthermore, CGI has practical significance (size effect) in this model ( $\beta$ -coefficients = 0.553).

These results suggest that there a strong positive relationship between the composite measure of CG and corporate performance. Thus, the regression results support the study hypothesis, which predicts that non-financial firms with better overall CG have better performance. Also, findings demonstrate that CG codes and guidelines matter for the market share of non-financial publicly listed firms. Specifically, when implementing a holistic approach by applying a suitable CGI for the Jordanian setting. The findings of present study support the argument adopted from the literature that a composite measure of CG is a more dependable instrument for assessing corporate performance (Almaskati et al., 2020), which means that non-financial firms with a higher score on the constructed CGI have superior operating performance according to market share. The study

**Table 6. Panel regression results for the relationship between cgi and market share**

| Variables                     | Coefficients (t-statistics) | P> t  |
|-------------------------------|-----------------------------|-------|
| Constant                      | 2.068 (3.96)                | 0.000 |
| CGI                           | .553 (2.65)                 | 0.008 |
| LEV                           | .067 (2.77)                 | 0.006 |
| SIZE                          | .086 (11.43)                | 0.000 |
| AGE                           | 3.23 (1.08)                 | 0.283 |
| GROWTH                        | .0196 (1.83)                | 0.067 |
| M/B                           | 1.798 (2.48)                | 0.013 |
| <b>Year Dummy</b>             | <b>Included</b>             |       |
| <b>Industry Dummy</b>         | <b>Included</b>             |       |
| <b>F-statistic</b>            | <b>94.86</b>                |       |
| <b>Prob. &gt; F</b>           | <b>0.0000</b>               |       |
| <b>R<sup>2</sup> (within)</b> | <b>0.698</b>                |       |
| <b>Observations</b>           | <b>672</b>                  |       |
| <b>Number of groups</b>       | <b>84</b>                   |       |

All variables are defined in Table 2.

result is in line with the theoretical predictions of agency theory, as suggested by Jensen and Meckling (1976), which posits that good-quality CG greatly improves the corporate performance by reducing agency costs and enhancing the alignment between the interests of managers and shareholders (Akbar et al., 2016).

The findings of current study also support the argument by Love (2011) that good-quality CG leads to a reduction in the defrauding of shareholders by management, and thus improved protection of shareholders, which in turn prompts investors to accept lower returns on their investments, reduces cost of capital, and improves corporate performance. Which mean that non-financial firms in Jordan that adhere with CG guidelines provide high protection of shareholders' rights. In addition, these results seem to be in line with other research which uses the composite measure of CG in the context of developing countries such as Hodgson et al. (2011) in Thailand, Sami et al. (2011) in China, Abdallah and Ismail (2017) in Gulf Cooperative Council region. The results are also consistent with those of Bhatt et al. (2017) who found that the self-developed CGI was highly correlated with enhancing performance of the listed firms in Malaysia. As well, the findings support a research conducted by Wahyudin et al. (2017), which found that CG rating influences the financial performance of firms listed on the Indonesian Stock Exchange. In addition, Klapper and Love (2004) found that better CG is highly correlated with better operating performance. Control variables including leverage ratio (LEV), a firm's size (SIZE), the sales growth (GROWTH), and market-to-book ratio of equity (M/B) shows a positive and significant correlation with a dependent variable, market share at the 1%, 5%, and 10% significance. Unlike the earlier studies, the current article surprisingly establishes that firm age (AGE) is not meaningfully contributing to non-financial Jordanian sector performance. The results are also consistent with those of Ciftci et al. (2019) for Turkish firms listed in Borsa Istanbul.

### **6.1. Additional analysis using GMM estimators**

The data was primarily analysed through application of fixed-effect method which is a good way to remove unobserved heterogeneity between different groups in model and tackling some extent of endogeneity problem (Bozec et al., 2010; Ullah et al., 2018). Although several advantages of fixed-effect estimators it cannot tackle completely endogeneity problems, which is caused by reverse causality, time-invariant endogenous variables, and measurement errors (Akbar et al., 2016; Al-ahdal & Hashim, 2022; Almaskati et al., 2020; Wintoki et al., 2012). Thus, this study enlarges further on the regression analysis presented in Table 7 to address worries of endogenous feedback between CGI and firm performance nexus. Moreover, many scholars (e.g., Brown et al., 2011; Chauhan et al., 2016) argue that the governance-performance nexus may be biased as they fail to control for potential endogeneity concerns. In this regard, an area of CG and corporate performance has been explored in-depth, yet very few papers have used GMM estimators to alleviate endogeneity concerns (Saini & Singhania, 2018; Ullah et al., 2018). Thus, there may be a chance of reverse causality in the results due to which changes in the internal features of firms can be accountable for the CG compliance and corporate performance relationship. In order to address these endogeneity problems and to infer correctly, this present study used two-step system GMM (second-order transformation) as an additional analysis to achieve robustness and generalizability of main outcomes reported in Table 6. In order to acquire estimates of two-step System GMM we run `xtabond2` in Stata 14 (Roodman, 2009). The two-step system GMM models are vigorous to heteroscedasticity, autocorrelation and can take care dynamic nature of endogeneity than those generated by fixed-effect model (Akbar et al., 2016; Al-ahdal et al., 2020; Wintoki et al., 2012).

In brief, the GMM estimator controlled for different kinds of endogeneity by including past-dependent variable (lagged value) as an explanatory variable in the model, and these lagged values are hired as instruments variable to tackle endogeneity problems (Akbar et al., 2016; Saini & Singhania, 2018).



**Table 7. Results of system GMM model estimation**

| Variables                        | Coefficients (z-statistics) | P> z  |
|----------------------------------|-----------------------------|-------|
| Constant                         | 1.053 (7.46)                | 0.000 |
| M. Share (t-1)*                  | 0.346 (11.21)               | 0.000 |
| CGI                              | 0.483 (2.79)                | 0.005 |
| LEV                              | -.141 (-1.59)               | 0.112 |
| SIZE                             | .0124 (2.83)                | 0.005 |
| AGE                              | -.0397 (-3.71)              | 0.000 |
| GROWTH                           | .0758 (4.45)                | 0.000 |
| M/B                              | .0308 (6.42)                | 0.000 |
| <b>Year Dummy</b>                | <b>Included</b>             |       |
| <b>Wald chi<sup>2</sup></b>      | <b>3043.95</b>              |       |
| <b>Prob &gt; chi<sup>2</sup></b> | <b>0.000</b>                |       |
| <b>Hansen J.</b>                 | <b>0.290</b>                |       |
| <b>AR(1)</b>                     | <b>0.005</b>                |       |
| <b>AR(2)</b>                     | <b>0.468</b>                |       |
| <b>No. of Group</b>              | <b>84</b>                   |       |
| <b>No. of Instrument</b>         | <b>61</b>                   |       |

\* M. Share (t-1) is past dependent variable (lagged value of market share). All variables are defined in Table 2.

As Table 7 shows, this study applies standard diagnostic tests (Hansen tests and Arellano–Bond test for first-order and second-order correlation) to determine that GMM estimator can be an appropriate econometric model to apply or not. As reported in Table 7, results of these tests implies that instruments involved in the GMM estimator are exogenous, and no auto-correlation (or no serial correlation) in model, which indicates that GMM estimator is valid to use.

Table 8 offerings a comparison between fixed-effects and GMM results. Table 8 shows that GMM estimator produces the same results that were produced by fixed-effects regression, except LEV and AGE. We display that our results are unlikely confounded by endogeneity. Therefore, tend to be less vulnerable to endogeneity. Thus, the relationship between CGI and corporate performance is not spurious due to endogeneity in Jordanian context.

## 6.2. Sensitivity tests

In this section, we perform additional tests to ensure that our results are robust. Thus, this paper elaborates further on the regression analysis presented in Tables 9 and 10 as follow:

### 6.2.1. Alternative measure of corporate performance

To check whether our results are sensitive to the performance measure and to infer correctly, the regressions are repeated using ROE as a dependent variable in the model instead of market share as an alternative measure of firms' performance similar with prior study done by Alodat et al. (2021).

The results in Table 9 remain robust when this dependent variable ROE is introduced. The overall model is significant at  $p < 0.01$ , with within  $R^2$  of 0.31. While further analysis indicates a significant association at the level of  $<0.05$  between CGI mechanisms and corporate performance (ROE). The authors found that results in Table 9 are similar to the results in Table 6 after conducting the fixed effect models for corporate performance measure (ROE). The consistency of results in all models for the classified groups imply that the results in Table 6 are robust and accurate. In general, the results are consistent with what we have shown in our main findings.

**Table 8. Comparison between the results of fixed-effects and GMM regressions**

| Variables | Fixed-effects model | GMM model   |
|-----------|---------------------|-------------|
|           | M. Share            | M. Share    |
| CGI       | (+)Sig.             | (+)Sig.     |
| LEV       | (+)Sig.             | (-)Non sig. |
| SIZE      | (+)Sig.             | (+)Sig.     |
| AGE       | (+)Non sig.         | (-)Sig.     |
| GROWTH    | (+)Sig.             | (+)Sig.     |
| M/B       | (+)Sig.             | (+)Sig.     |

All variables are defined in Table 2.

### 6.2.2. Subsample analyses on classified groups to Younger and Mature firms

Further, for checking the robustness of the above results in Table 6, the authors classified the firms on the basis of their age into two groups based on the mean value of age of Jordanian-listed firms at ASE for period 2009–2016 which is 19 year; those from 0 to 19 years old as Younger and those from 19 to 80 years old mature firms. The underlying logic behind this test due to the main results revealed that firm age is not meaningfully contributing to non-financial Jordanian sector performance as suggested by (e.g., Alabdullah, 2018; Saidat et al., 2019). In addition, there are an increasing interest in firm age and its effects on firm performance (Coad et al., 2018).

As Table 10 shows, the dependency resulting from the clustering of the data at the mean of firm age revealed that a positive and significant correlation between younger firms and a dependent variable, market share at the 5% significance. On the other hand, the relationship between mature firms and firm performance are negative and significant at 1% level. These results uncover that younger non-financial firms in Jordan are likely to have newer assets relative to mature firms.

**Table 9. Regression results for the relationship between CGI and return on equity**

| Variables                     | ROE                         |       |
|-------------------------------|-----------------------------|-------|
|                               | Coefficients (t-statistics) | P> t  |
| Constant                      | -167.34 (-6.51)             | 0.000 |
| CGI                           | 35.16 (3.42)                | 0.001 |
| LEV                           | -30.06 (-8.07)              | 0.000 |
| SIZE                          | 8.43 (6.14)                 | 0.000 |
| AGE                           | 1.3 (1.29)                  | 0.196 |
| GROWTH                        | 12.39 (7.83)                | 0.000 |
| M/B                           | -.056 (-0.06)               | 0.951 |
| <b>Year Dummy</b>             | <b>Included</b>             |       |
| <b>Industry Dummy</b>         | <b>Included</b>             |       |
| <b>F-statistic</b>            | <b>18.86</b>                |       |
| <b>Prob. &gt; F</b>           | <b>0.0000</b>               |       |
| <b>R<sup>2</sup> (within)</b> | <b>0.315</b>                |       |
| <b>Observations</b>           | <b>672</b>                  |       |
| <b>Number of groups</b>       | <b>84</b>                   |       |

All variables are defined in Table 2. Return on Equity (ROE) is measured as a percentage of net income to shareholders equity.

**Table 10. Panel regression results for the relationship between CGI and market share (By Age)**

| Variables                        | Coefficients (t-statistics) | P> t  | Coefficients (t-statistics) | P> z  |
|----------------------------------|-----------------------------|-------|-----------------------------|-------|
|                                  | Younger Age                 |       | Mature Age                  |       |
| Constant                         | -.864 (-4.71)               | 0.000 | -1.675 (-2.76)              | 0.006 |
| CGI                              | .494 (2.54)                 | 0.014 | .1887 (1.52)                | 0.128 |
| LEV                              | -.058 (-2.08)               | 0.038 | .108 (0.88)                 | 0.381 |
| SIZE                             | .0538 (5.24)                | 0.000 | .12 (4.18)                  | 0.000 |
| AGE                              | .055 (2.18)                 | 0.029 | -.195 (-2.67)               | 0.008 |
| GROWTH                           | .0235 (2.28)                | 0.023 | -.13 (-3.07)                | 0.002 |
| M/B                              | .641 (16.23)                | 0.000 | .572 (11.77)                | 0.000 |
| <b>Year Dummy</b>                | <b>Included</b>             |       | <b>Included</b>             |       |
| <b>F-statistic</b>               | <b>2533.88</b>              |       | <b>-</b>                    |       |
| <b>Prob. &gt; F</b>              | <b>0.000</b>                |       | <b>-</b>                    |       |
| <b>Wald chi<sup>2</sup> (12)</b> | <b>-</b>                    |       | <b>57.23</b>                |       |
| <b>Prob &gt; chi<sup>2</sup></b> | <b>-</b>                    |       | <b>0.000</b>                |       |
| <b>R<sup>2</sup> (within)</b>    | <b>0.7271</b>               |       | <b>-</b>                    |       |
| <b>R<sup>2</sup> (between)</b>   | <b>-</b>                    |       | <b>0.4138</b>               |       |
| <b>Observations</b>              | <b>287</b>                  |       | <b>385</b>                  |       |
| <b>Number of groups</b>          | <b>52</b>                   |       | <b>54</b>                   |       |

All variables are defined in Table 2.

## 7. Conclusions

Grounded in agency theory (Jensen & Meckling, 1976), this study expects that firms with good CG practices outperform those with poor CG practices. Stimulated by the introduction of the Jordanian voluntary Code of CG in 2009, this study explores the influence of CG practices on the performance of the Jordanian publicly listed firms during the period 2009–2016. This was assessed through a custom-built CGI to measure the CG-performance relationship during the full period and investigating the influence of the introduction of the code on firm-level compliance and corporate operating performance. The results show an enhancement in the degree of compliance on the basis of the CGI with the Jordanian code provisions during the period of study, but there remains much room for improvement. This indicates that stronger CG practices were in place after the voluntary code was implemented. After controlling for firm characteristics, current study finds out that a better degree of compliance with the Jordanian code and guidelines is positively and significantly related with better performance of publicly listed firms. The results of this study therefore imply that the underlying principles of CG are applicable in less-developed markets, in particular, Jordan. The outcome of this study is consistent with the research of Abdallah and Ismail (2017) and Bhatt et al. (2017) in developing countries. Also, in spite of the divergence in institutional contexts between developed and developing countries, the evidence provided by the current study proves that the agency theory is applicable in the case of developing economies, and particularly in the Jordanian context.

We make several contributions to the literature. First, using non-financial firms listed in ASE and comprehensive data on firm-level CGI collected directly from firm annual reports, we provide direct empirical evidence on the relationship between Jordanian CG guidelines and corporate operating performance. Second, this study offers further insights into the objectivity of contradictory performance measures. This study contributes to CG literature by exploring the CGI-performance nexus in the Jordanian settings depending on market share as a novel measure of corporate performance. Third, this study provides the full impression of a CG cycle

confirming that the recent interventions in 2017 by JSC through imposing mandatory guidelines are a step in the right direction. In the same context, CG and institutions in developed countries are dissimilar to those in developing countries. Thus, the earlier findings cannot be generalised to Jordanian firms as CG system is considered relatively new to the Jordanian environment, and the capital market is viewed not as broad and deep as in developed ones. Fourth, this study relies on a holistic approach to quantify and assess the range of compliance with Jordanian CG codes and guidelines by developing a suitable CGI for developing countries, which derived from an internationally accepted set of governance principles. There are very few studies that used a composite measure of governance based on panel data to evaluate these guidelines and explore its influence on corporate performance in Jordanian setting. Fifth, this study relies on internal CG mechanisms that play a more vital role in the absence of solid outside institutions. Finally, one of this paper's contributions is that it depends on market share as a novel measure of corporate performance in governance literature. To the researchers' knowledge, no earlier study has studied corporate governance indices in such an association.

The current study suffers from the some limitations. First, the study sample is relatively tiny. Accordingly, to confirm our results, the sample size should be extended. Future research is encouraged to explore such a relationship between CG practices and operating performance in other developing countries or over cross-countries research. Second, this study does not look at all of the Jordanian CG code, as it considered only 32 attributes to assess the level of compliance for a sample of firms listed on the ASE. Future research is encouraged to extend this index by using other attributes. Furthermore, to validate our results from different perspective, future research must look into the framework of the current study.

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