**Antecedents of Audit Quality in MENA Countries:
The Effect of Firm- and Country-Level Governance Quality**

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This paper investigates the effect of firm- and country-level governance quality on audit quality, as measured by (i) auditor choice and (ii) audit fees. Our findings are three-fold. First, our evidence suggests that board independence is positively related to engaging a Big 4 auditor, while family shareholdings show a negative association with hiring a Big 4 auditor. Second, board size, board independence, and director shareholdings are positively related to audit fees, while government shareholdings and family shareholdings show a negative relationship with audit fees. Third, higher country-level governance quality is positively associated with hiring a Big 4 auditor and paying higher audit fees. Overall, we provide evidence that external audit quality in Middle Eastern and North African (MENA) countries is affected by firm- and country-level governance quality, which suggests that governance quality and external audit quality seem to be complements in protecting stakeholders interests through securing higher audit quality. Our results are robust to controlling for alternative measures and endogeneities.

Key words: Firm- and country-level governance quality; audit quality; auditor choice; audit fees; MENA countries.

JEL Classification: G30. G32. G34. M42

1. Introduction

The main aim of this study is to examine the under-researched relationship between governance structures, both at the firm- and country-levels, and audit quality, as measured by auditor choice and audit fees in the context of emerging markets. In particular, our focus is on Middle Eastern and North African (MENA) countries that provide a rich ground to link governance mechanisms and audit quality.[1]

There is an increased interest in the quality of governance, particularly the role of good governance in enhancing the quality of corporate financial reporting (Chau & Leung 2006; ; Elmagrhi *et al*. 2016; Elghuweel *et al*. 2017; Al-Bassam *et al*., 2018). Auditing is an important part of enhancing the quality of financial reporting in that the audit process also seeks to provide independent verification of the financial statement prepared by management (O'Sullivan, 2000; Khalil & Ozkan, 2016; Ben-Hassoun *et al*., 2018). In this case, financial scandals in the 1990s/2000s sharply brought the issue of quality and reliability of audited information to the fore (O'Sullivan, 2000; Asthana *et al*., 2010; Habbash & Alghamdi, 2017). Indeed, most of the existing governance codes aim to keep external auditors independent from corporate management (Samaha & Hegazy, 2010; Khlif & Samaha, 2014). Therefore, an independent auditing process is seen as a governance device through which shareholders can monitor management, and by extension, the corporate financial reporting process (Fan & Wong, 2005; Lin & Liu, 2009, 2010; Cascino et al., 2010; Barroso *et al*., 2018).

Furthermore, the importance of financial reporting quality in developing countries, and particularly in the MENA region, is arguably more obvious than in developed countries because financial reports are the main reliable source of public information available to investors compared to media releases, news conferences, and financial analysts' updates that are easily and frequently available in most developed countries (Afify, 2009; Al-Ajmi, 2009; Baatwah *et al*., 2015). Therefore, high quality audited reports have the capacity to enhance decision making and reduce information asymmetry in these markets (Afify, 2009; Samaha & Hegazy, 2010; Ben-Hassoun *et al*., 2018). Further, this study is motivated by the recent increasing interest from academics, practitioners, policymakers, and regulators in the audit market in MENA countries in particular. A major reason for this is that the audit market plays an important role in preserving transparency and improving the functioning of the capital markets (Watts & Zimmerman, 1983; Naser & Hassan, 2016). Accordingly, regulatory authorities have enacted a stream of reforms, such as issuing laws, regulations, and national governance codes that are aimed at enhancing the quality of audit in these countries, and thereby enhancing the integrity of financial reports (Khalifa, 2012; Baatwah *et al*., 2015).

On the other hand, it can be argued that firm- and county-level governance quality may also affect a firm's audit quality (Hay *et al*., 2008; Lin & Liu, 2009; Asthana *et al*. 2010; Johansen & Pettersson, 2013; Zahra, 2014). However, there is limited evidence within the extant literature on the impact of firm- and country-level governance quality on audit quality (see Zahra, 2014). This, therefore, provides interesting opportunities to contribute to the audit and governance literature by providing new evidence within the context of emerging markets (O'Sullivan, 2000; O'Sullivan & Diacon, 2002; Fan & Wong, 2005; Gul *et al*, 2013).

Country-level governance systems are maintained, guarded, and enforced by institutions, such as the legal system and legislative processes (Aguilera & Jackson, 2003; Ioannou & Serafeim, 2012; Baldini *et al*., 2018). Through regulations, country-level governance structures may also determine and shape firm-level governance mechanisms (Zahra, 2014) and their legitimacy (Judge *et al*., 2008). One reason is that in some emerging economies, governments may play a visible role in shaping country-level governance structures through legislation and direct ownership (partial or full), as well as regulating and monitoring the markets (Samaha & Hegazy, 2010; Zahra, 2014). However, the relationship between these systems and country-level governance structures has been argued to be dynamic (Aguilera & Jackson, 2003; Zahra, 2014; Barroso *et al.,* 2018). As such, deficiencies in firm-level governance quality can induce changes in country-level governance quality; the opposite may also be applicable.

However, it is noticeable that most empirical studies on audit quality have focused mainly on the client's characteristics (e.g., size, complexity, and risk) (Simunic, 1980; Gul *et al*., 2013), and the client-auditor relationship (e.g., auditor tenure and the type of non-audit services) (O'Sullivan & Diacon, 2002; Klumpes *et al*., 2016) to explain variations in audit quality. In response to calls for empirical testing of the relationship between governance and audit quality (Al-Ajmi, 2009; Ben-Hassoun *et al.,* 2018), this study seeks to investigate the impact of various firm- and country-level governance mechanisms on audit quality. Similarly, most of the existing studies on audit quality have been conducted in developed countries (e.g., the US and UK), where the audit market and governance environment are not identical to those in the MENA region and thus, are expected to affect audit quality differently (Chan *et al*., 1993; Carcello *et al*., 2002; Al-Ajmi, 2009; Gul *et al*, 2013; Ben-Hassoun *et al.,* 2018). For example, Barroso *et al.* (2018) examine how two prominent corporate governance models, namely the shareholder and stakeholder models tend to have different effects on the relationship between block ownership and audit fees in 19 countries, but did not include any developing or MENA countries in their sample. In particular, the MENA context has distinctive cultural features of having strong hierarchical (e.g., royalty) social structure, where greater

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importance is usually attached to informal relationships, such as family loyalty, norms, and tribalism than formal governance and accountability mechanisms, like corporate boards (Haniffa & Hudaib, 2007; Al-Bassam *et al.*, 2018). The MENA corporate setting is further characterised by concentrated shareholding structures, especially by government and families, and low levels of institutional shareholdings, resulting in weak ability of shareholders to enforce managerial accountability, responsibility, and control (Haniffa & Hudaib, 2007; Piesse *et al.*, 2012; Khalil & Ozkan, 2016). Arguably, these factors may have an effect on the incentive to pursue high-quality audits. Meanwhile, the extant literature suggests that contextual factors tend to determine the degree of audit effort, and hence, audit quality (Barroso *et al.*, 2018). Accordingly, these contextual challenges raise serious empirical questions as to whether voluntary compliance with governance codes that are prevalent in MENA economies, on their own, can help improve audit quality in their listed corporations (Al-Ajmi, 2009; Al-Bassam *et al.*, 2018).

Consequently, this study seeks to examine the extent to which firm- and country-level governance quality and characteristics influence audit quality, where evidence is rare, and thereby making a number of new contributions to the extant auditing and governance literature. First, the paper contributes to the literature by offering new evidence on the extent to which board characteristics (e.g., board size, board independence, and board leadership structure) influence audit quality. Second, we provide new evidence on the effect of shareholding structure (e.g., government, director, and family shareholdings) on audit quality. Finally, we offer evidence on the extent to which country-level governance quality drives audit quality. To the best of our knowledge, this is the first major study to test the potential relationship between firm- and country-level governance quality, on the one hand, and audit quality, on the other hand within the MENA context. In this case, our study responds directly to Zahra's (2014) and Barroso *et al.*'s (2018) specific calls for researchers to further examine whether country-level governance structures (country's legal system and legislative processes) are complements or substitutes to firm-level governance mechanisms in protecting stakeholders interests through securing higher audit quality. In this case, our study provides a multi-country evidence on the effect of firm- and country-level governance quality and characteristics on audit quality, as measured by auditor choice and audit fees. Therefore, our study is distinct from past MENA studies that have investigated audit quality in that they are either exclusively single country-focused (e.g., Afify, 2009; Al-Ajmi, 2009; Baatwah *et al.*, 2015; El-Dyasty, 2017) or concentrate on only one proxy of audit quality (audit report lag or Big 4 auditor) (e.g., Afify, 2009, Al-Ajmi, 2009; Baatwah *et al.*, 2015, El-Dyasty, 2017; Hassoun *et al.*, 2018).

The rest of the paper is organised as follows. The next section presents issues relating to audit quality and audit profession in the MENA region. The following sections review the literature and formulate hypotheses, present the research design, and discuss the empirical results and sensitivity tests, whilst the final section concludes the paper.

2. Audit Quality and Audit Profession in the MENA Region: Background and Institutional Framework

MENA countries, like other developing countries, share common cultural characteristics, such as a strong hierarchical social structure, greater importance of personal relationships, religion, accountability, and trust, and developmental status of socio-economic institutions (Haniffa & Hudaib, 2007; Al-Ajmi, 2009; Habbash & Alghamdi, 2017). Similarly, the stock markets in the MENA region along with the auditing environment have some distinct features that are different from those of most developed countries. For instance and generally, there is concentrated shareholding structure often dominated by the state and powerful families, especially royal families (Wahdan *et al*., 2005; Al-Ajmi, 2009; Samaha & Hegazy, 2010; Mohamed & Habib, 2013; Habbash & Alghamdi, 2017; Ben-Hassoun *et al.,* 2018). External auditing mitigates agency problems by verifying the quality of the financial statements, which reduces information asymmetry and thereby ensuring that the interests of other external shareholders are protected (Francis & Wang, 2008; Desender *et al*., 2013; Barroso *et al.,* 2018).

In addition, the accounting and auditing professions are often directly regulated by central governments, and litigation risk is low in the context of a relatively less efficient capital markets operating in the MENA region (Wahdan *et al*., 2005; Al-Ajmi, 2009; Samaha & Hegazy, 2010; Khalifa, 2012; Mohamed & Habib, 2013; Barroso *et al*., 2018; Ben-Hassoun *et al*., 2018). In particular, the state and powerful royal families in most MENA countries can influence the recruitment and appointment of members of staff in most professions, including audit firms (Wahdan *et al*., 2005; Mohamed & Habib, 2013). The political and legal structures and social values (such as, religion, hierarchical social structure, importance of kinship, norms, and ethics) may also impact the audit profession and consequently the quality of audit services provided (Haniffa & Hudaib, 2007). These factors tend to impact negatively on auditor independence and therefore can affect the capacity of auditors to conduct high-quality audits (Haniffa & Hudaib, 2007; Barroso *et al*., 2018). Some of these countries also have laws requiring audit firms to hire a certain percentage of nationals. The Saudi Organisation for Certified Public Accountants (SOCPA), for example, requires all audit firms to have at least 30% of their staff to be composed purely of Saudi nationals. This may affect the

quality of the audit service provided in these countries by limiting the pool of talents that audit firms can recruit from (Haniffa & Hudaib, 2007).

Apart from the above, there are a number of factors that may negatively affect audit quality in most MENA countries. First, there is often no effective code of professional ethics governing the work and practices of accountants and auditors (Wahdan *et al*., 2005; Samaha & Hegazy, 2010; Mohamed & Habib, 2013). Second, powerful professional organisations responsible for developing the audit profession are often absent (Al-Ajmi, 2009; Samaha & Hegazy, 2010). Third, there are few opportunities for new audit firms and auditors to enter the MENA markets, and thereby further limiting auditor independence and audit quality (Mohamed & Habib, 2013; Habbash & Alghamdi, 2017). Fourth, there is no independent regulatory body to reinforce the independence of auditors and to improve the governance and regulation of the auditing profession (Al-Ajmi, 2009; Barroso et al., 2018). Finally, the number of listed companies tends to be very small in which auditors are prohibited from providing many types of non-audit services or having a long-term client relationship. Consequently, there is very intense competition among audit firms within the audit market (El-Dyasty, 2017; Barroso *et al.,* 2018). This may induce auditors to attract and retain clients by providing a fee-cutting strategy or be compliant with whims and caprices of management, and thereby impacting negatively on audit quality (Barroso *et al*., 2018).

Despite the underdevelopment of the audit profession and audit market in the MENA region, most MENA countries have experienced a rapid shift in economic development following the oil boom of the 1970s, and this has increased the demand for high-quality audit service (Haniffa & Hudaib, 2007; Ajmi, 2009; Ben-Hassoun *et al.,* 2018). In particular, there is a strong presence of multinational firms and international financial institutions along with a gradual shift of ownership rights from the state to private and institutional investors, which require better protection of such investments through better-quality audit by more reputable auditors (Choi *et al*., 2008; Al-Ajmi, 2009; Samaha & Hegazy, 2010; Khalifa, 2012; Ben-Hassoun *et al*., 2018).

Moreover, international auditing firm networks working in MENA countries are not only familiar with national accounting standards, but also International Standards on Auditing (ISA) compared with small- and medium-sized audit firms (Al-Ajmi, 2009; Samaha & Hegazy, 2010; El-Dyasty, 2017). This is expected to enhance the quality of information issued by listed companies audited by large audit firms with international affiliations with explicit commitment to maintain high audit standards set by the International Auditing and Assurance Standards Board (IAASB) (Samaha & Hegazy, 2010; El-Dyasty, 2017). Also, some governments in the MENA region often offer training

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contracts to large audit firms with international networks to train nationals towards obtaining professional accounting qualifications from the US and UK (Al-Ajmi, 2009).

In the meantime, it should be noted that most MENA countries require listed firms to prepare their financial statements in accordance with International Accounting Standards (IFRS/IAS) or national accounting standards that have been developed in accordance with the IFRS/IAS (Afify, 2009; Baatwah *et al*., 2015). For example, SOCPA is a professional organization established in 1991. It operates under the supervision of the Ministry of Commerce to promote the accounting and auditing profession. In 2012, SOCPA began its project for transition to International Accounting and Auditing Standards, requiring listed firms other than banks and insurance companies to report using IFRS with some modifications, which included: adding more disclosure requirements, removing optimal treatments and amending the requirements that contradicted Sharia or local laws. Meanwhile, the Saudi Arabia Monetary Authority (SAMA) required local banks and insurance companies to report using IFRS. SOCPA will require the adoption of the IFRS as issued by the IASB in addition to the requirements and disclosures added to some standards by SOCPA, such as the subject of Zakat (religious tax) with effect from 2017 for all listed entities, and 2018 for all other publicly accountable entities.

In the Sultanate of Oman, the Capital Market Authority (CMA) supervises the capital market and audit firms accredited to audit the financial statements of the companies regulated by the CMA among other roles. Article 282 of the Executive Regulation of the Capital Market Law issued in 1998 states that listed companies shall prepare financial statements in accordance with IFRS. The 2002 Omani governance code also requires companies to prepare financial statements in accordance with IFRS. The Egyptian Ministry of Investment issued Decree No. 110/2015. This decree required listed firms to follow the 39 Egyptian Accounting Standards (EAS) to replace the 35 former EAS that had been adopted in 2006 by Decree No. 243/2006. The 39 new EAS include many, but not all, of the principles in the IFRS. In Jordan, Companies Law No. 22 issued in 1997 by the National Assembly (the legislative body) required public and private shareholding companies, general partnerships, limited partnerships, limited liability companies, private shareholding companies, and foreign companies operating in Jordan to organise their accounts and keep registers and books in accordance with recognised International Accounting and Auditing Standards.

The UAE's Federal Commercial Companies Law No. 8 issued in 1984 and its amendment, law No. 13 issued in 1988, were released by the Ministry of Economy. These two laws require firms to keep detailed records and to provide audited financial statements to the ministry and other authorities concerned, without explicit specification of the particular standards to be followed.

However, they can only recommend companies to follow internationally accepted accounting practices. Additionally, the UAE issued Commercial Companies Law No. 2 of 2015. This law requires all companies to apply International Accounting Standards and practices when preparing their accounts.

Most governance codes issued in MENA countries also stress the importance of the services provided by the external auditor in enhancing the quality and credibility of corporate financial statements (Samaha & Hegazy, 2010; Habbash & Alghamdi, 2017). In addition, these codes recommend measures that seek to ensure that external auditors are independent from management. For example, Jordanian and Omani governance codes suggest that during their annual general meeting, shareholders shall appoint the external auditor for one year, to be renewable as appropriate. The board of directors, after consulting the audit committee, can also make recommendations for the selection, appointment, re-appointment, and terms of the auditor's engagement. In order to ensure the independence of the external auditor, these codes recommend further that the audit engagement should not be renewed after four consecutive years. Similarly, the re-election of auditors may not take place before a minimum of two years. Further, the external auditor should not provide non-audit services that might impair their independence. Indeed, developing accounting and auditing profession helps the current fragmented regulatory context of the MENA countries (Khalifa, 2012).[2] This is because accountancy could become a cornerstone of an improved corporate governance regime in these countries (Khalifa, 2012).

For example, Baatwah *et al*. (2015) document that, on average, 120 companies are listed on the Muscat Securities Market in Oman over the 1988-2013 period. Additionally, on average, 17 certified auditors/audit firms are competing to provide statutory and non-statutory audit services for these companies with the dominance of Big 4 audit firms. While El-Dyasty (2017), in a study that covers 232 firms representing 95% of companies listed in Egyptian stock of exchange in 2016, report that Big 4 audit firms hold 34.4% of the Egyptian market, private local audit firms control 31% of the Egyptian market, while audit firms affiliated with foreign firms (not including Big 4) constitute about 34%. This suggests that, on average, the MENA audit market is very small and that the competition between auditors may be very high (Baatwah *et al*., 2015; Naser & Hassan, 2016; El-Dyasty, 2017). This imbalance between the supply and demand for audit services is expected to impact audit quality and its determinants.

Although the MENA countries' governments have made great efforts to establish governance codes for listed companies in recent years that are largely similar to those in developed countries, the effect of those rules and regulations have yet to be studied (Khlif *et al*., 2014). Consequently, the

objective of this paper is to examine the extent to which firm- and country-level governance quality influence audit quality in this unique MENA setting. Therefore, this may help to advance and enhance the governance practices and audit quality in the MENA region.

3. Literature Review: Theory, Empirical Studies and Hypotheses Development

The separation of ownership and management in modern corporations can lead to rational managers engaging in opportunistic behaviour by often expropriating owners' wealth to their own benefit if not monitored (Jensen & Meckling, 1976). One way of reducing self-serving behaviour among managers is to incur agency costs by instituting governance and internal control mechanisms, such as appointing corporate boards, board committees, and auditors (internal and external auditors) aimed at monitoring managers (Elmagrhi *et al*., 2016; Elghuweel *et al*., 2017; Habbash & Alghamdi, 2017; Al-Bassam *et al*., 2018). It should be noted, however, that the separation of ownership and management is not the only source of agency conflict. Since various interested parties are associated with business organisations, there have been different types of principal-agent relationships (e.g., between controlling shareholders and minority shareholders, bondholders and shareholders) (Lin & Liu, 2009, 2010).

In this case, a major way by which agency conflicts can be reduced is for shareholders to appoint independent external auditors (Barroso *et al.,* 2018). It has generally been argued that the appointment of external auditors can enhance the quality and fairness of financial reports prepared by management for shareholders through their ability to detect and report material deviations from generally accepted accounting principles (GAAP), such as the IFRS (Habbash & Alghamdi, 2017). Consequently, firms need to employ auditors to audit their books with a view to improve the credibility of their financial reporting, and thereby mitigating any inherent agency problems (Gul *et al*., 2013; Habbash & Alghamdi, 2017). In this case, shareholders may need to make two critical decisions. The first decision relates to the calibre (choice) of the auditor (e.g., Big 4 versus non-Big 4 audit firm), and the second inherent decision is the cost of the audit. Indeed, evidence exists that suggests that audit quality is positively associated with the size and reputation of the auditor (e.g., DeAngelo, 1981; Gul *et al*., 2013; Habbash & Alghamdi, 2017). This means that large and reputable auditors (e.g., Big 4 audit firm) may be considered as an additional layer of governance mechanism aimed at monitoring a firm's financial reporting process better compared with their smaller counterparts (Fan & Wong, 2005; Lin & Liu, 2009, 2010; El-Dyasty, 2017). Similarly, large investment in audit quality is reflected in high audit fees (Francis, 2004; Choi *et al*. 2008, 2010).

On the other hand and from agency theoretical perspective, it can be argued that firm-level governance mechanisms may also affect a firm's choice of audit/auditor quality (O'Sullivan, 2000; Carcello *et al*., 2002; Hay *et al*., 2008; Lin & Liu, 2009; Asthana *et al*. 2010; Johansen & Pettersson, 2013; Ben-Hassoun *et al*., 2018). In general, it can be expected that firms adopting sound governance mechanisms have a better control over operating activities and management performance (Al-Ajmi, 2009, Zahra, 2014). Thus, the firm's management or its controlling shareholders are not totally free in the choice of auditor. In contrast, in poorly-governed firms, management or controlling shareholders have a better opportunity to influence the auditor-hiring decision towards their own interests (Lin & Liu, 2009, 2010).

From the country-level perspective, country-level governance systems represent the legal system and legislative processes that shape public-private collaboration and participation (Judge *et al*., 2008). Through regulations, country-level governance also determines and shapes corporate governance (Judge *et al*., 2008; Zahra, 2014), including audit quality. Judge *et al*. (2008) argued that variations in law and order may affect the extent to which governance practices are legitimate because corporations are created by laws, and governance is a mechanism by which laws are enacted and enforced. Additionally, firms operating in countries with effective country-level governance that strongly protect investor rights, are more likely experience more widespread shareholdings, greater separation of shareholding and control, and higher levels of outside (minority) shareholdings (La Porta *et al*., 2000; Jaggi & Low, 2000). Therefore, these firms may experience higher levels of agency problems, and thereby demand higher quality audit (employ a Big 4 auditor and pay higher audit fees) in order to produce credible financial reports (Francis *et al*., 2003; Francis & Wang 2008; Gul *et al*, 2013).

Audit quality refers to the ability of an auditor to detect misstatements, and the willingness to report misstatements uncovered in an audit process without fear or favour (DeAngelo, 1981; Mohamed & Habib, 2013; Knechel, 2016). The auditor's technical capabilities and competence determine his/her ability to discover a breach in the client's accounting system. However, the probability of reporting the misstatements is a function of the auditor's independence, size, financial clout, and reputation (DeAngelo, 1981; Knechel, 2016; Habbash & Alghamdi, 2017). Specifically, DeAngelo (1981) argues that the quality of an audit process is a function of the size of the audit firm, or its market share. Large audit firms are more likely to provide higher-quality audit in order to sustain their reputation and minimize litigation costs (Gul *et al*, 2013; Eshleman & Guo, 2014; Habbash & Alghamdi, 2017). Furthermore, large audit firms usually have better training programmes, and a higher degree of independence and industrial expertise, which equip their staff with the skills to detect

and report irregularities in the financial statements provided by management (Francis & Wang, 2008; Eshleman & Guo, 2014). On the other hand, because of the relatively limited industrial knowledge and resources available to small audit firms, they are more likely to provide lower-quality audit services (Krishnan, 2003). Similarly, higher audit fees may reflect audit quality and auditor effort (Chen *et al*., 2016). Consequently, we conjecture that auditor choice and audit fees may be influenced by the quality of firm- and country-level governance structures, which is the central rationale underlying the current study.

Although prior studies examining the effect of governance quality on audit quality are rare, a few exist. Therefore and in this section, we draw on the prior theoretical and empirical literature to develop specific hypotheses of interest. Specifically, we examine three sets of firm- and country-level governance mechanisms, namely: (i) board characteristics, including board size, board independence, and board leadership structure; (ii) shareholding structure, including government shareholding, director shareholding, and family shareholding; and (iii) country-level governance quality on audit quality.

3.1. Corporate boards and audit quality

3.1.1. Board size and audit quality

Agency theory suggests that larger boards are more efficient in monitoring and evaluating managerial behaviour than smaller boards, which can ensure that they operate in the best interest of shareholders (Jensen & Meckling, 1976; Fama & Jensen, 1983; Lin & Hwang, 2010). This is because a large number of members on the board is less likely to be affected by a dominant CEO than are smaller boards (Ntim & Soobaroyen, 2013). Furthermore, large boards may include directors with variety of knowledge and corporate and financial expertise that can effectively manage the resources, such as capital of the firms (Pfeffer, 1973). On the other hand, other scholars have argued that smaller boards provide a better controlling and monitoring function than larger boards, because large boards face coordination and communication problems that can outweigh the advantages of having more members (Jensen, 1993; Ben-Hassoun *et al*., 2018). Carcello *et al*. (2002) argue that the board of directors affect the quality of the audit services performed, either directly or indirectly. First, with regard to direct control, the board of directors generally consult with management when appointing the external auditor, subject to shareholder ratification at the annual general meeting. Consequently, the board is more likely to be involved in reviewing the overall planned audit scope and proposed audit fees (Public Oversight Board, 1994; Blue Ribbon Committee, 1999). Second, and with respect to indirect control, external auditors may perform a higher-quality audit in order to meet the

expectations of corporate boards that demand higher-quality audit (e.g., independent, diligent, and expert). By contrast, Carcello *et al.* (2002) suggest that larger and qualified boards substitute the demand for high audit quality in order to improve financial reporting quality, resulting in payment of low audit fees. Therefore, it is expected that there will be a significant relationship between board size and audit quality.

Empirically, Asthana *et al.* (2010) offer evidence, which suggests that board size is positively associated with quick disassociation from auditors with a bad reputation. Similarly, Lin and Liu (2009) report empirical evidence based on a sample of Chinese firms, which indicates that firms with stronger internal governance mechanisms, as measured by a large number of supervisory board (SB) members, are more likely to hire higher-quality auditor in order to enhance the monitoring role of the board. Further, the findings of Abdul Hamid and Abdullah (2012) indicate a positive link between board size and audit fees for Malaysian government-linked companies. Recently, using a sample of newly privatized firms in the MENA region, Ben-Hassoun *et al.* (2018) find that board size is positively related to appointing Big 4 auditor. However, there are differences among MENA governance codes about the appropriate size of a board. The Egyptian governance code, for example, suggests that it should not be less than five members if they are to be effective. The Saudi governance code recommends a board size between 3 and 11 members, whilst the Jordanian governance code recommends it to be between 3 and 13.[3] Consequently, our first hypothesis to be tested is:

H1: Audit quality is significantly associated with board size.

3.1.2. Board independence and audit quality

Independent directors tend to or are perceived to be more likely to act in the best interests of shareholders than traditional full-time utility maximising mangers (Carcello *et al.*, 2002; Abdul Hamid & Abdullah 2012; Khalil & Ozkan, 2016). Since shareholding and management are separated in most modern corporations, managers have an opportunity to manipulate reported financial results for opportunistic purposes (e.g., boost their pay motives or future employment prospects) (Jensen & Meckling, 1976; Watts & Zimmerman, 1983). On the other hand, outside directors are motivated to work as representatives of shareholders to prevent and detect such opportunistic reporting by management (Fama & Jensen, 1983; Hay *et al.*, 2008), and this can be achieved by pursuing higher-quality audit services (Ben-Hassoun *et al.*, 2018). The willingness of independent directors to protect shareholder interests is often driven by their motivation to enhance their future reputational capital in the labor market as expert monitors by not associating themselves with poor corporate performance (Fama & Jensen, 1983; Gilson, 1990). In this case, outside directors may be more inclined to support

the appointment of a Big 4 auditor and to pay higher audit fees compared with executive directors (Carcello *et al.*, 2002; Ben-Hassoun *et al.* 2018). Chau and Leung (2006) find a positive association between the percentage of independent non-executive directors on the corporate board and audit committee formation.

The empirical results of O'Sullivan (2000), Carcello *et al.* (2002), Hay *et al.* (2008), Abdul Hamid and Abdullah (2012), and Johansen and Pettersson (2013) support the positive and significant relationship between the percentage of non-executives on the board and audit fees. Also, Afify (2009) finds evidence from Egypt supports that independent boards have a positive impact on financial disclosure quality and more efficient and effective audit, and hence reduce the audit report lag. However, using evidence from MENA countries, Ben-Hassoun *et al.* (2018) find that board independence shows a negative relationship with the likelihood of appointing a Big4 auditor. By contrast, O'Sullivan and Diacon (2002) find no empirical evidence to support this relationship. Regarding MENA governance codes, the Egyptian, Jordanian, Omani, and UAE governance codes recommend that corporate boards should be formed by a majority of non-executive directors in order to enhance board independence and effective monitoring of executives. Given the above theoretical and empirical literature, the second hypothesis is as follows:

H2: Audit quality is significantly associated with board independence.

3.1.3. Board leadership structure and audit quality

The board of directors is an effective governance mechanism to ensure that management behave in the best interest of shareholders (La Porta *et al.*, 1998; Fan & Wong, 2002). Specifically, the board is responsible for executing the decisions taken during shareholders' meetings, including hiring, firing, remunerating, counselling, and monitoring senior managers. However, executive directors (including the CEO) may be biased in monitoring and evaluating management. Therefore, the separation of CEO and board chairperson positions is essential if the board is to effectively meet its internal governance monitoring role (La Porta *et al.*, 1999; Gelb & Zarowin, 2002). The dual positioning on both CEO and board chairperson positions at the top (i.e., unitary leadership structure) can result in power concentration in a few senior executives, and thereby compromising the independence of the board of directors (Jensen, 1993; Tsui *et al.*, 2001). The literature documents that CEO role duality is associated with weak governance and aggressive earnings management (Hudaib & Cooke, 2005). Although, combining the two roles may provide the CEO with more perspectives on the company and encourage him/her to act with determination (Lin & Liu, 2009, 2010), it may impair corporate accountability and transparency due to the limited ability of the board

to effectively monitor the CEO's actions (Sharma, 2004). Therefore, companies dominated by a single CEO/chairperson (i.e., unitary leadership) may be less motivated to seek an intensive audit, and consequently may hire non-Big 4 audit firm and/or pay a lower audit fees (O'Sullivan, 2000). In contrast, unitary board leadership impairs ability to monitor managerial opportunism. This can lead to the need to engage high-quality auditor and therefore, the payment of high audit fees (Tsui *et al.*, 2001; Ben-Hassoun *et al.*, 2018).

Asthana *et al*. (2010) document empirical evidence, which suggests that dual leadership structure (i.e., separation of the CEO and chairperson roles) is positively associated with quick disassociation from auditors with a bad reputation. Lin and Liu (2009) and Ben-Hassoun *et al*. (2018) argue that firms whose board chairperson is independent from the CEO are more likely to select a higher-quality auditor to monitor the quality of the financial reporting process and management performance. In their later study, Lin and Liu (2010) document empirical results that demonstrate that firms in which the CEO and chairperson positions are held by the same person are more likely to switch to a smaller auditor rather than to a larger one. Additionally, using evidence from Egypt, Afify (2009) finds a positive association between CEO duality and audit report lag as a proxy for audit quality. On the other hand, Tsui *et al*. (2001), found that separating the two positions provides an effective monitoring mechanism that substitutes for high audit quality, and therefore results in the payment of low audit fees. However, the results of O'Sullivan (2000) suggest no relationship between CEO/chairperson role duality and audit fees. The Egyptian, Omani, Saudi, and UAE governance codes recommend separation of the chairperson and CEO roles in order to ensure that boards are capable of performing their monitoring role effectively. Given the above theoretical and empirical literature, the third hypothesis to be tested is:

H3: Audit quality is significantly associated with board leadership structure.

3.2. Shareholding structure and audit quality

3.2.1. Government shareholding and audit quality

Corporations with higher government shareholding may seek to win government support by providing more transparent and trustworthy financial statements (Ntim & Soobaroyen, 2013). The winning of government support can be translated into legitimisation of corporate operations (Aguilera *et al*., 2007) and greater opportunity to acquire essential resources, such as subsidies, tax exemptions, and contracts (Ben-Hassoun et al., 2018), and thereby improving performance. Additionally, corporations with higher government shareholding face more agency conflict between government and other shareholders, and therefore prefer to conduct better and more extensive auditing in order to

provide more informative financial statements (Al-Janadi *et al*., 2016; Al-Bassam *et al*., 2018; Barroso et al., 2018). However, government agencies can exercise a substantial influence over government-controlled firms (mainly through additional board members), and can readily have access to the firm's private information (Chan *et al*., 2006; Barroso *et al*., 2018). Accordingly, they tend to focus more on direct monitoring (Desender *et al*., 2013). Therefore, firms with high government shareholding have less incentive to provide highly credible financial reports to monitor management and reduce information asymmetries, and thus are less likely to choose high-quality audit firms, and thereby preferring to pay lower fees (Lin & Liu, 2010; Ben-Hassoun *et al*., 2018; Barroso *et al.*, 2018). Likewise, some studies argue that higher levels of state shareholding, with wide and powerful political connections, provide protection against review and discipline by regulatory authorities (e.g., Hou & Moore, 2010). Consequently, firms with high government shareholding are less likely willing to be extensively monitored by high-quality audit/auditors.

The ownership of most listed companies in MENA countries remains concentrated and is typically state ownership, which brings a unique set of governance challenges (Ben-Hassoun *et al*., 2018). Government shareholding probably has important vested interests that often hinder governance efficiency at the company level (Khlif *et al*., 2015; Al-Janadi *et al*., 2016). For example, Al-Janadi *et al*., (2016) found that state-ownership is negatively associated with financial reporting quality in Saudi Arabia.

Nevertheless, there is a general dearth of studies that examine the association between government shareholding and audit quality, and therefore a genuine opportunity to contribute to the audit and governance literature by providing new evidence. Ben-Hassoun *et al.* (2018) report that government ownership has negative correlation with the likelihood of appointing a Big 4 auditor. However, Lin and Liu, (2010) find that government shareholding has no effect on auditor switching decisions. Also, Niemi (2005) finds insignificant relationship between audit fees and government shareholding. Based on these arguments, the fourth hypothesis is as follows:

    H4: Audit quality is significantly associated with government shareholding.

3.2.2. Director shareholding and audit quality

It has been argued that managerial or director shareholding reduces agency conflict with shareholders by aligning their interests with those of shareholders, and thereby increasing firm value (Jensen & Meckling, 1976; Khalil & Ozkan, 2016). Boards have the power to make or at least approve all important company decisions, and therefore it is probable that board members with appropriate stock ownership will have the incentive to offer effective monitoring and oversight of these important

corporate decisions (Khalil & Ozkan, 2016). In this case, an increase in director shareholding can reduce the conventional agency problems, and thereby enhance directors' incentives to provide greater levels of corporate disclosures in order to reduce information asymmetry. Effective auditing is perceived as a defensive measure against managerial control (Shleifer & Vishny, 1997; Barroso *et al.,* 2018). Thus, financial reporting quality and diligent auditing can lower the cost of capital, and therefore greater alignment of interest occurs when management shareholding is increased (Khalil & Ozkan, 2016). On the other hand, director shareholding provides an effective monitoring mechanism that can substitute for high audit quality, and therefore result in the payment of low audit fees (O'Sullivan, 2000).

MENA countries are characterised by weak investor protection and less developed capital markets (Al-Ajmi, 2009; Samaha & Hegazy, 2010; Mohamed & Habib, 2013; Ben-Hassoun *et al*., 2018), and thus managerial ownership is likely to be perceived as an efficient governance mechanism that offset the less developed formal corporate governance systems (Wahba, 2014; Khlif *et al.,* 2015). This is because managers are more informed than outsiders, and hence managerial ownership is considered as an effective internal governance mechanism that reduces information asymmetries and increases financial reporting and audit quality (Khlif *et al*., 2015; Khalil & Ozkan, 2016).

O'Sullivan (2000) reports a negative and significant relationship between executives and non-executives shareholding, and audit fees. Similarly, Barroso *et al.* (2018) find a negative association between audit fees and insiders' ownership. Further, Niemi (2005) documents that audit hours and fees are lower for companies, which majority owned by their management. In the MENA context, Wahba (2014) finds a significant negative association between debt and firm performance when managerial ownership is concentrated. Based on these arguments, the fifth hypothesis is:

H5: Audit quality is significantly associated with director shareholding.

3.2.3 Family shareholding and audit quality

Firms in MENA countries are dominated by high percentage of family ownership (Wahdan *et al*., 2005; Al-Ajmi, 2009; Samaha & Hegazy, 2010; Mohamed & Habib, 2013; Habbash & Alghamdi, 2017; Ben-Hassoun *et al*., 2018). Thus, separation of ownership and control is not as clear as in the more developed countries. This provides MENA countries with a unique institutional setting that allows us to examine the possible effect of family shareholding on audit quality. Family shareholders usually participate in the management of the firm either directly or indirectly and influence most of the management decisions (Chau & Leung 2006; Cascino *et al.,* 2010; Ho & Kang, 2013). Furthermore, family firms are more likely to appoint family members on the board,

deteriorating monitoring activities, therefore decreasing reliability perceived by financial markets (Anderson *et al*., 2009). Additionally, family shareholders with higher concentrated ownership have sufficient control to follow their own objectives without fear of disciplinary actions from other minority ownership interests (Chau & Leung, 2006). Thus, they may attempt to maximize their own interest by engaging in benefit-transfer that expropriate other stakeholders (; Fan & Wong, 2002; Barroso *et al.,* 2018). Ultimately, family shareholders tend to held private information, increasing information asymmetry with outsiders (Barroso *et al*., 2018). These agency conflicts may induce managers to hide private information from other outside shareholders that potentially leads to lower quality of financial reports (Cascino *et al*., 2010). Audit quality can be considered as a governance and monitoring mechanism which help to improve financial reporting quality especially in high agency conflict situations (Al-Ajmi, 2009; Barroso *et al*., 2018; Ben-Hassoun *et al.,* 2018). From the audit supply side, audit firms tend to increase the scope of their audit, and hence the audit fees, for firms with high agency conflicts because of increased audit risk (inherent and/or control risk) and auditor business risk (litigation risk) (Khalil *et al*., 2008).

On the other hand, family shareholders tend to have long-term orientation and reputational concerns (Khalifa, 2012). They also have less diversified portfolios and hold large blocks of shares, thus they have the incentives and means to control managerial opportunism (Barroso *et al.,* 2018). Furthermore, they have access to internal/private information because family members participate in the management or serve as directors on the board (Chen et al., 2008). Family shareholders with private information tend to provide more direct monitoring through appointing additional board members (Desender *et al*., 2013; Ho & Kang, 2013). Therefore, they have lower incentives to demand external auditing services/ hiring top-tier auditors to monitor managers since they also bear most of the costs (Ho & Kang, 2013; Barroso *et al*., 2018). Similarly and from the audit firm side, in competitive audit markets with low litigation risk, like most MENA countries, audit firms have little incentive to include a risk premium associated with high agency conflicts (Barroso *et al*., 2018).

Empirically, Barroso *et al*. (2018)'s findings indicate that auditors are more opportunistic, not driven by the shareholders' needs, in low litigation countries. They also find a negative relationship between audit fees and the blockholders' ownership in family firms in stakeholder model countries. Similarly, using a sample of S&P 1500 firms, Ho and Kang (2013) find that family firms demand lower audit effort resulting in lower audit fees. They also show that family firms are less likely to hire top-tier auditors and that auditors perceive lower audit risk for family firms. Chau and Leung (2006) find non-linear association between family shareholding and the existence of audit committee. Their results suggest that medium level family shareholding (between 5% and 25%) is negatively associated

with the existence of audit committees. However, at family shareholding of more than 25%, the existence of audit committees increases. On the other hand, Cascino *et al.* (2010)'s results indicate that Italian family firms exhibit higher accounting quality compared to nonfamily firms. Given the theoretical and empirical literature, the sixth hypothesis is:

> **H6**: *Audit quality is significantly associated with family shareholding.*

3.3. Country-Level Governance Quality and Audit Quality

Governance generally refers to the manner in which authority is exercised, including the respect for the institutions organizing the economies and social interactions among people and the governing bodies (Al-Marhubi, 2004; Zahra, 2014). Country specific regulations and systems constitute the framework within which companies operate. Consequently, governmental efficiency, regulations quality, and empowerment of laws are found to affect company's activities and outcomes (Aguilera & Jackson, 2003; Ioannou & Serafeim, 2012; Baldini *et al.*, 2018). Judge *et al.* (2008) argue that the legitimacy of governance practices is derived from the degree of law and order in the society, the cultural view of competitiveness, and the extent to which corruption is embraced within a nation.

Countries apply legal rules and regulations in order to maintain shareholders' interests from corporate insiders undertaking activities that would benefit themselves or other stakeholders instead of the shareholders (Aguilera & Jackson, 2003). Thus, in countries with higher-quality governance, where laws and regulations protect shareholders' interests effectively, company management has incentives to address the interests of shareholders (Aguilera & Jackson, 2003; Ioannou & Serafeim, 2012), that may be achieved through engaging in a better quality audit process (i.e., employ a higher-quality auditor and pay higher audit fees) (Francis & Wang, 2008; Gul *et al.*, 2013). Mateescu (2015) argues that companies operating in countries with higher rule of law, government effectiveness, and regulatory quality are more likely to be compliant with national governance codes and disclose more information. Also, companies operating in countries with higher levels of corruption are less likely to improve corporate disclosure (Ioannou & Serafeim, 2012; Baldini *et al.*, 2018), and audit quality. Thus, there may be higher demand for audit services (e.g., Big 4 and audit fees), together with a higher litigation risk in countries maintaining high-quality national governance (Barroso *et al.*, 2018). On the other hand, other scholars have argued that firms may substitute the poor governance function in weak investor protection countries by employing higher-quality auditors (Choi *et al.*, 2008).

MENA countries are generally characterised by relatively weak investor protection and minority rights, weak institutional environments, inefficient judicial system, heavy bureaucracy, and/or corrupt political institutions (Ben-Hassoun *et al.*, 2018). Given the lower shareholder

protection in MENA countries, the management, the board of directors, and the auditors operate in a low litigation risk setting (Barroso *et al*., 2018). However and recently, most of these countries' governments have undertaken large steps towards reforming their economies (e.g., privatisation) (Afify, 2009; Ben-Hassoun *et al*., 2018). Additionally, in most of the MENA region, especially the Gulf Cooperation Council (GCC) countries, governments have sought international capital and have very successfully grown the non-oil sectors of the economy. In order to maintain shareholders' interests and increase the confidence of the foreign investors, these countries have allowed the Big 4 audit firms to import their global quality assurance systems, hiring mainly auditors with foreign examined qualifications (Al-Ajmi, 2009; Samaha & Hegazy, 2010; Khalifa, 2012; El-Dyasty, 2017). Additionally, Transparency International Survey indicates that the UAE, Saudi Arabia and Egypt were ranked 25th, 55th, and 94th of 175 countries in the corruption perception index in 2014, and 30th, 63th, and 111th of 180 countries in 2009, respectively. Therefore, external auditors are expected to play key roles in preventing, detecting, and reporting fraud.

Most previous studies have found a positive effect of national institutional governance factors on corporate reporting quality (e.g., Mateescu, 2015; Baldini *et al*. 2018). Further, Francis *et al*. (2003) demonstrate that countries with strong investor protection legal framework are more likely to demand credible accounting (more accrual based and greater transparency) and audit enforcements (employing a Big 5 auditor and pay higher audit fees). Choi *et al*. (2008) find that audit firms charge higher fees to firms that are cross-listed in countries with stronger legal regimes. Based on these arguments, the final hypothesis is:

H7: Audit quality is significantly associated with country-level governance quality

4. Research Design

4.1. Sample selection and data sources

Our sample is based on 494 non-financial and non-utility corporations listed on the national stock exchanges of Egypt, Jordan, Oman, Saudi Arabia, and UAE (143, 121, 71, 112, and 47, respectively), with data over the 2009-2014 period. As traditional content analysis consumes a considerable amount of time and effort, we were able to collect data on 600 firm-year observations from 100 corporations employing the widely used stratified sampling technique based on firm size and industry in each country (Barako *et al*., 2006).[4] Following past studies (e.g., O'Sullivan, 2000; Carcello *et al*., 2002), financial and utility firms are excluded from this study because their operations, regulations, and governance structures are quite different from other types of firms (Lin & Liu, 2009, 2010; Elmagrhi *et al*., 2016). Therefore, the results can be discussed in the context of existing studies.

It is worth noting that the selected firms in our sample have provided us with the maximum number of observations for our main variables of interest (audit firm size, audit fees, and firm- and country-level governance mechanisms) and to be consistent among our sampled countries, we have selected similar number of firms (20 listed firms) in each of the five countries investigated.

The sampling period starts in 2009, because the 2007/2008 financial crisis increased debate surrounding the effectiveness of governance and disclosure practices (Elmagrhi *et al*., 2016). It ends in 2014 because this was the latest year for which the annual reports of listed corporations were published at the start of data collection. This design helps to obtain a balanced panel data analysis with the advantages of increasing the degrees of freedom and reducing the likelihood of multicollinearity among the examined variables (Wooldridge, 2010). This design also provides us with the opportunity to compare the current findings with the results of previous studies (Lin & Liu, 2009, 2010; Johansen & Pettersson, 2013).

In order to examine the impact of firm- and country-level governance on audit quality, firm-level governance variables (i.e., board characteristics and shareholding structure) were hand collected from the sampled firms' annual reports, their websites, and capital markets' websites. Country-level governance data, including: (i) voice and accountability; (ii) political stability and absence of violence/terrorism; (iii) government effectiveness; (iv) regulatory quality; (v) rule of law; and (vi) control of corruption indices were collected from the website of the World Bank. Financial and accounting variables were collected from the *Datastream* database. Not all firms provided data relating to audit fees, and therefore, firms that provided audit fees information across the sampled countries were selected to form an audit fees sub-sample. A total of 470 firm-year observations were obtained and finally used for the audit fee sub-sample analysis.

4.2. Measurement of variables and model specification

The variables used in testing our hypotheses are classified as follows. First, and following previous studies, a dummy variable was employed to divide audit firms in MENA countries into two categories: the Big 4 audit firms to proxy for higher-quality auditors and non-Big 4 audit firms to proxy for lower-quality ones, is our first dependent variable. Audit firm size has been used effectively and commonly as a surrogate for audit quality in many previous studies (e.g., DeAngelo, 1981; Lin & Liu, 2009, 2010; Eshleman & Guo, 2014; Habbash & Alghamdi, 2017; Ben-Hassoun *et al*., 2018). The constructed model examines whether firms' auditor choice is associated with their firm- and country- level governance quality. Firms will randomly select auditors if the two types of auditors (Big 4 and non-Big 4) do not differ in providing their monitoring service, suggesting that firm- and

country-level governance quality have no impact on the choice of auditors. Otherwise, the assumption is that the two groups of auditors offer monitoring services with varied levels of quality, suggesting that firm- and country-level governance mechanisms should impact their choice of auditors, based on the expected benefits and costs of needed level of audit quality. A natural log of audit fee (*LNFE*) in thousands of US dollars was used to measure audit fees (e.g., O'Sullivan, 2000; Carcello *et al*., 2002; O'Sullivan & Diacon, 2002; Choi *et al*., 2010; Johansen & Pettersson, 2013; Barroso et al., 2018), as our second dependent variable.

We use Big 4 auditor choice (DeAngelo, 1981; Eshleman & Guo, 2014; Khalil & Ozkan, 2016; Ben-Hassoun *et al*., 2018) and audit fees (Choi *et al*., 2010; Chen *et al*., 2016), as proxies for audit quality. Unlike their non-Big 4 counterparts, Big 4 audit firms have greater resources, technical knowledge, and global reach, allowing them to deal with clients more objectively without fear or favour (DeAngelo, 1981; Al-Ajmi, 2009; Choi *et al*., 2010; Khalil & Ozkan, 2016). In addition, the key factors, which can enhance the credibility of an audit report provided by a Big 4 auditor include better professional audit expertise, a wider range of skills, higher reputation, greater accounting and auditing knowledge, and higher ethical standards than their non-Big 4 counterparts (Al-Ajmi, 2009; Choi *et al*., 2010; Samaha & Hegazy, 2010; Eshleman & Guo, 2014). Therefore, Big 4 auditors provide high-quality audit services than small audit firms (Choi et al., 2010; Samaha & Hegazy, 2010). Generally, in developing countries, but particularly in the MENA region, firms have more incentives to engage Big 4 auditors in order to improve firm-level governance structures in order to substitute for the relatively weak country-level institutions (Al-Ajmi, 2009; Ben-Hassoun *et al*., 2018). Samaha and Hegazy (2010) and Khalifa (2012) argue that the fragmented regulatory context of accounting and auditing in the MENA countries has allowed the Big 4 audit firms to import their global quality assurance systems into the local MENA context, hiring mainly auditors with foreign examined qualifications. Additionally, Big 4 audit firms are perceived by financial statement users and scholars in MENA countries to be associated with higher audit quality than their non-Big 4 counterparts (Al-Ajmi, 2009; Samaha & Hegazy, 2010; Ben-Hassoun *et al*., 2018).

Audit fees are normally determined according to the economic cost of the audit and reputation of the auditor (Carcello *et al*., 2002). These costs vary with the size, complexity, risk, and other characteristics of the auditee and auditor (Kalelkar & Khan, 2016; Barroso *et al*., 2018). Auditors seek to minimize total costs by reducing the amount of additional audit work, whilst at the same time, attempting to avoid potential reputational damage and future losses arising from litigation (Choi *et al*. 2010; Kalelkar & Khan, 2016). Larger audit investigations require more audit hours and/or use of more specialised audit staff, resulting in higher audit fees (O'Sullivan, 2000; Barroso et al., 2018).

Francis (2004) also argues that large audit fees possibly means that large investment is being made in audit quality. Extent literature also shows that audit quality is priced in the market (Choi *et al*. 2008, 2010). Consequently, the use of Big 4 auditors and audit fees, have understandably been widely perceived as reasonable indicators of monitoring through the provision of high quality audit.

To test our hypotheses, we categorise our explanatory variables into two sets (firm- and country-level governance variables). The first set is firm-level governance variables, including board characteristics measuring board size (*BRDS*), board independence (*IND*), and unitary board leadership (*UBL*), and corporate shareholdings relating to government shareholding (*GOSH*), director shareholding (*DISH*) and family shareholding (*FLSH*).

Second type of explanatory variables is country-related variables. We operationalise country-level governance quality by employing country-level data compiled by Kaufmann *et al*. (2014). There are six governance indicators measuring the extent of governance quality at the national level (i.e., rule of law, government effectiveness, control of corruption, voice and accountability, political stability, and regulatory quality). Because the six governance indicators are strongly correlated, it is difficult to claim that they are genuinely measuring different dimensions of governance within each country (Al-Marhubi, 2004). Therefore, we use the six governance indicators separately and subsequently, we combine the six indices measured based on percentile rank terms ranging from 0 (lowest) to 100 (highest) into a composite indicator (National Governance Index *(NGI)*), using the simple averaging of the six national governance indicators in line with previous studies (e.g., Al-Marhubi, 2004).

Consistent with previous studies (e.g., O'Sullivan, 2000; Carcello *et al*., 2002; O'Sullivan & Diacon, 2002; Lin & Liu, 2009, 2010; Asthana *et al*., 2010; Barroso et al., 2018; Ben-Hassoun *et al*., 2018), the current study controls for possible omitted variables bias by including a number of control variables that have been found to have an effect on auditor choice and audit fees, namely firm size (*LNTA*), busy season *(BUSY)*, quick ratio *(QUIK)*, firm loss (*LOS*), leverage (*LV*), growth opportunity (*SGR*), return on assets (*ROA*), year dummies for the study period 2009–2014 (*YDU*), and industry dummies (*IRY*).

[Insert table 1 about here]

4.3. Models specification

This study develops a logit regression model to test the impact of firm- and country-level governance quality on auditor choice for 600 firm-year observations during the period 2009 to 2014. Model 1 specification is of the following general form:

$$BIG4_{it} = \alpha_0 + \beta_1 BRDS_{it} + \beta_2 IND_{it} + \beta_3 UBL_{it} + \beta_4 GOSH_{it} + \beta_5 DISH_{it} + \beta_6 FLSH_{it} + \beta_7 NGI_{it} + \sum_{i=1}^{n} \beta_i CONTROLS_{it} + \varepsilon_{it} \quad (1)$$

Consistent with previous studies investigating determinants of audit fees, the current study also uses OLS regression model to explain the determinants of audit fees (e.g., O'Sullivan, 2000; O'Sullivan & Diacon, 2002; Carcello *et al.*, 2002; Fan & Wong, 2005; Barroso *et al.*, 2018). Model 2 regresses governance and control variables on the log of the audit fee for 470 firm-year observations, as follows:

$$LNFE_{it} = \alpha_0 + \beta_1 BRDS_{it} + \beta_2 IND_{it} + \beta_3 UBL_{it} + \beta_4 GOSH_{it} + \beta_5 DISH_{it} + \beta_6 FLSH_{it} + \beta_7 NGI_{it} + \sum_{i=1}^{n} \beta_i CONTROLS_{it} + \varepsilon_{it} \quad (2)$$

Where *BIG4* is audit firm size, *LNFE* is natural log of audit fee, *BRDS* is board size, *IND* is the percent of non-executive directors (NEDs) on the board, *UBL* is the unitary board leadership, *GOSH* is government shareholding, *DISH* is director shareholding, *FLSH* is family shareholding, *NGI* is national governance index, and *CONTROLS* refers to a number of control variables, including, *LNTA* is firm size, *BUSY* is busy season, *QUIK* is quick ratio, *LOS* is firm loss, *LV* is leverage, *SGR* is growth opportunity, *ROA* is return on assets, *YDU* is year dummies for the study period 2009–2014, and *IRY* is industry dummies. We use time dummies to control for possible variation over time in audit quality measures due to unobserved time-related factors.

5. Empirical Results and Discussion

5.1. Univariate statistics

Table 2 summarises the descriptive analysis of the dependent, independent, and control variables over the study period. Panel *A* presents descriptive statistics for the two main dependent variables. The Big 4 audit firms dominate the audit market in MENA countries as they audit most of the sampled firms with the mean of 59% (354/600), supporting the argument that the audit profession and audit market of the MENA region is undeveloped (Wahdan *et al.*, 2005; Al-Ajmi, 2009; Samaha & Hegazy, 2010; Mohamed & Habib, 2013), and the Big 4 audit firms provide a superior and trustful audit service that qualify them to dominate most of the MENA region's accounting and auditing markets (Al-Ajmi, 2009; Samaha & Hegazy, 2010; El-Dyasty, 2017). Our findings are consistent with those of other previous studies, which show that the mean of a Big 4 audit firm in Egypt (Khalil & Ozkan, 2016), Oman (Elghuweel *et al.*, 2017), and Saudi Arabia (Al-Bassam *et al.*, 2018) is 59%, 71%, and 58%, respectively. Furthermore, the average audit fees is US$49.35 thousand and ranges from a minimum of $4.06 thousand to a maximum of $865.79 thousand, with standard deviation of

$82.31 thousand, confirming that audit fees paid to external auditors have wide variation among firms listed in MENA countries.

Moreover, the descriptive statistics for independent (firm- and country-level governance) and control variables are reported in Panels *B* and *C*, respectively. Panel *B* shows wide variation of the explanatory variables. *BRDS* has an average of 8.52 board members and ranges between a minimum of four and a maximum of 19. Panel *B* shows that *IND* varies between 40% and 100%, with an average of 87.43%, indicating that the board of directors in MENA listed firms are more likely to be dominated by NEDs. Additionally, 474 (79%) of the firm-year observations investigated reveals that listed firms in the MENA region are complying with the recommendations of governance codes issued in these countries by having separate board chairperson /CEO roles. These descriptive statistics are consistent with those of previous studies in MENA countries (e.g., Afify, 2009; Al-Janadi et al., 2016; Elghuweel *et al.* 2017; Al-Bassam *et al.* 2018). Shareholding structure mechanisms in sample firms also show an adequate variation, where *GOSH*, *DISH,* and *FLSH* range from 0%, 0%, and 1.08% to 98.67%, 98.92%, and 100% with an average of 16.15%, 44.94%, and 49.85%, respectively, supporting the findings of previous studies conducted in MENA countries. For example, Al-Janadi *et al*., (2016) find government shareholding in Saudi Arabia listed firms to be 11.19% on average. With regard to country-level variable, *NGI* ranges from 21.87% to 71.03%, with the average (median) of 49.37% (49.71%) and standard deviation of 13.24%. This shows that there is heterogeneity among MENA countries in terms of national governance quality.

[Insert table 2 about here]

Table 3 presents the correlation coefficient matrix (including both Pearson's parametric and Spearman's non-parametric bivariate coefficients) for different dependent, independent, and control variables. Using Pearson's parametric correlation coefficients only, *BIG4* is positively related, at a significant level, to *BRDS*, *IND*, *GOSH*, *DISH*, *NGI*, *LNTA*, *BUSY*, *LV*, *SGR*, and *ROA,* whereas *BIG4* is significantly and negatively related to *UBL, FLSH*, and *LOS*. Likewise, Table 3 shows that *LNFE* is positively related, at the significant level, to *BIG4*, *BRDS*, *IND*, *GOSH*, *NGI*, *LNTA*, *BUSY*, and *LV,* whereas *LNFE* is significantly and negatively related to *UBL and FLSH*. In general, the results of the correlation matrix support that auditor choice and audit fees are affected by firm- and country-level governance measures, that board characteristics (board size, board independence, and separation of CEO/chairperson positions), shareholding structure (government shareholding), and country-level governance quality have a positive and significant effect on the choice of a Big 4 auditor and audit fees. By contrast, family shareholdings have a negative and significant effect.

[Insert table 3 about here]

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5.2. Multivariate regression analyses

Table 4 reports the empirical results for the two regression models to test the association between firm- level governance quality and both of auditor choice and audit fees. Models 1, 2, 3, and 4 show the logistic regressions of firm-level governance quality (i.e., board characteristics and shareholding structure mechanisms) and control variables on auditor choice. With Pseudo R-square of 36.40% and a Chi-square 295.93***, the logistic model (Model 3) is statistically significant and differentiates the listed firms selecting a Big 4 (high-quality) auditors from those selecting non-Big 4 auditors. Models 5, 6, 7, and 8 report the cross-sectional OLS regressions of independent and control variables on audit fees. With F-value 46.33***, the OLS model (Model 7) is statistically significant and can predict 72.29% of the change in audit fees.

[Insert table 4 about here]

First, a number of previous studies suggest that board characteristics may affect audit quality (O'Sullivan, 2000; Carcello *et al*., 2002; Hay *et al*., 2008; Lin & Liu, 2009; Asthana *et al*., 2010; Lin & Liu, 2010; Johansen & Pettersson, 2013; Ben-Hassoun et al., 2018). Therefore, in order to determine whether board characteristics affect auditor choice and audit fees, Eq. 1 and 2 are estimated by including the three board characteristics (board size—*BRDS*, board independence—*IND*, and unitary board leadership—*UBL*). Models 1 and 3 reveal an insignificant impact of *BRDS* on *BIG4*, whereas Models 5 and 7 show a positive and significant link between *BRDS* and *LNFE*, suggesting that *H1* is empirically supported. This evidence is consistent with theoretical predictions of agency theory, which suggest that larger boards are more able to monitor managers effectively (Jensen & Meckling, 1976; Lin & Hwang, 2010). Larger boards with qualified and experienced members may require more audit effort, which can increase auditor's costs and consequently raise audit fees (Carcello *et al*., 2002). With reference to the empirical literature, our results are consistent with the findings of the previous studies that have found positive effect of board size on audit quality (e.g., Lin & Liu 2009; Asthana *et al*., 2010; Abdul Hamid & Abdullah, 2012).

The findings, illustrated in Models 1, 3, 5, and 7, show a positive and significant relationship between *IND* and both of *BIG4* and *LNFE*. This suggests that boards with higher percentage of NEDs are more likely to demand an extensive audit service and ultimately hire reputable audit firms (Big 4 auditor) and pay higher audit fees, which supports *H2*. Therefore, the findings are consistent with agency theory, which argues that independent NEDs aim to protect and enhance their reputational capital in the market of directors as expert monitors (Fama & Jensen, 1983; Gilson, 1990), to avoid legal liability (Gilson, 1990), and to protect shareholders' wealth from losses arising because of

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financial reporting problems (Carcello *et al*., 2002) through not associating themselves with poor corporate performance and performing their monitoring role with due care. These findings are consistent with a number of previous studies that report positive link between board independence and audit quality (e.g., O'Sullivan, 2000; Carcello *et al*., 2002; Hay *et al*., 2008; Abdul Hamid & Abdullah, 2012; Johansen & Pettersson, 2013).

Models 1, 3, 5, and 7 reveal that *UBL* does not impact *BIG4* and *LNFE*. Notably, agency theory suggests that separation of the roles of chairperson and that of the CEO enhances the monitoring role of the board of directors (La Porta *et al*., 1999; Gelb & Zarowin, 2002). Therefore, firms with separate CEO/chairperson roles are more likely to employ a Big 4 auditor and pay higher audit fees. Our findings are inconsistent with a number of previous results that have found negative impact of unitary board leadership on audit quality (e.g., Lin & Liu, 2009, 2010; Asthana *et al*. 2010), but it is consistent with other past evidence that report insignificant link between unitary board leadership and audit quality (e.g., O'Sullivan, 2000; Abdul Hamid & Abdullah, 2012).

We develop our board governance index (*BRDGI*) with the available governance variables for our sample, following previous studies (e.g., Al-Najjar, 2015; Ben-Hassoun *et al*., 2018). The governance variables included in this index are as follows: board size, board independence, and board leadership structure. The scale ranges from 0 to 3 (equal weights). If a firm in a year meets all of the components of the governance index, then, it is given an index value of 3; and for firms that meet none of the criteria, a value of 0 is assigned. The construction of the index is based on the recommendations of the governance codes in each of the sampled five countries. For example, *BRDGI* for Saudi firms is equal to three (3) when board size is between 3 and 11, the percentage of outsiders is greater than 50%, and the position of CEO is separated from the position of chairperson of the board. *BRDGI* is equal to zero (0) if board size is lower than 3 or greater than 11, the percentage of outsiders is lower than 50%, and the CEO is also the chairperson of the board. Model 4 shows a significant positive impact of *BRDGI* on *BIG4*, whereas Model 8 illustrates insignificant link between *BRDGI* and *LNFE*. This result is consistent with previous studies (e.g., Ben-Hassoun *et al*., 2018) that have argued that effective board of directors encourages firms to engage high quality auditor in MENA countries.

Second, a number of previous studies suggest that shareholding can impact audit quality (e.g., O'Sullivan, 2000; O'Sullivan & Diacon's, 2002; Fan & Wong, 2005; Hay *et al*., 2008; Lin & Liu, 2009, 2010; Barroso *et al*., 2018; Ben-Hassoun *et al*., 2018). Therefore, in order to determine whether the shareholding affect auditor choice and audit fees, Eq. 1 and 2 are estimated by including the three shareholding variables (government shareholding—*GOSH*, director shareholding—*DISH*, and family

shareholding—*FLSH*). Models 2, 3, 6, and 7 report findings indicating that *GOSH* has a negative significant impact on *LNFE* which supports *H4*. Theoretically, government institutions can exercise a substantial influence over government-controlled firms, and they can easily gain access to a firm's information (Chan *et al*., 2006). Consequently, firms with high government shareholding are less likely to provide highly credible financial reports, and thus they are less likely to choose high-quality audit firms, and prefer to pay low audit fees (Lin & Liu, 2010). Our findings are consistent with Ben-Hassoun *et al*. (2018), who report evidence of a negative correlation between government shareholding and audit quality in MENA countries.

The results reveal a positive and significant relationship between *DISH* and *LNFE*, which supports *H5*, while it reports insignificant impact of *DISH* on *BIG4*. These findings support the notion that in firms with high levels of director shareholding, the agency problem shifts from the manager–stockholder relationship to conflicts between the controlling owners and minority stockholders (Shleifer & Vishny, 1997; Fan & Wong, 2002). Therefore, the controlling owners (directors) have an incentive to pay high audit fees in order to mitigate agency conflicts between controlling owners and the minority shareholders (Fan & Wong, 2005). Our findings are inconsistent with O'Sullivan (2000) who reports a negative and significant link between director shareholding and audit fees. Furthermore, the results in Models 2, 3, 6, and 7 report empirical evidence suggesting that *FLSH* has a negative and significant impact on both *BIG4* and *LNFE*, which supports *H6*. These findings indicate that family shareholders in MENA countries have access to internal/private information (Chen et al., 2008). Therefore, they have low incentives to demand external auditing services/hiring top-tier auditors to monitor managers since they also bear most of the costs (Barroso et al., 2018). Our results are consistent with previous studies that have found negative effect of family shareholding on audit quality (e.g., Ho & Kang, 2013; Barroso *et al*., 2018).

We develop our shareholding governance index (*SHRGI*) with the available governance variables for our sample, following previous studies (e.g., Al-Najjar, 2015; Ben-Hassoun *et al*., 2018). The governance variables included in this index are as follows: government shareholding, director shareholding, and family shareholding. The scale ranges from 0 to 3 (equal weights). If a firm in a year meets all of the components of the governance index, then, it is given an index value of 3; and for firms that meet none of the criteria, a value of 0 is assigned. As there is no specific indication of the recommended views on shareholding governance index details, the average of the shareholding variable is taken. *SHRGI* is equal to three (3) when a firm's government and family shareholding are lower than the overall average in each sampled country, and firm's director shareholding is greater than the overall average in each sampled country. *SHRGI* is equal to zero (0), when a firm's

government and family shareholding are greater than the overall average in each sampled country, and firm's director shareholding is lower than the overall average in each sampled country. Model 4 shows insignificant impact of *SHRGI* on *BIG4*, whereas Model 8 illustrates a significant positive link between *SHRGI* and *LNFE*. This result suggests that effectiveness of shareholding structure encourages firms to engage auditors to spend more effort (high audit quality) in MENA countries.

Third, a number of previous studies suggest that country-level governance quality affects different corporate activities (e.g., Jaggi & Low, 2000; Ioannou & Serafeim, 2012; Zahra, 2014; Mateescu, 2015; Baldini *et al*., 2018). Therefore, in order to determine whether national governance quality affects auditor choice and audit fees, Eq. 1 and 2 are estimated by including the six national governance indicators (i.e., rule of law, government effectiveness, control of corruption, voice and accountability, political stability, and regulatory quality) and their average. We have included each of the six national governance quality indicators and their overall average in separate modules because of the high correlation among them. Generally, the findings reported in Table 5, Models 1 to 14 indicate that the national governance quality indicators are positively and significantly related to *BIG4* and *LNFE*. In our sampled countries (based on un-tabulated numbers), UAE and Oman have average national governance quality of 67% and 58%, but average Big 4 usage rate of 75% and 75%, and audit fees of $111,860 and $36,883, respectively. In contrast, Egypt has an average national governance quality of 29%, but average Big 4 usage rate of 53% and audit fees of $25,543. Our results support the argument that country-level governance and audit quality complement each other towards mitigating agency conflicts, and thereby facilitating a more credible financial reporting (Judge *et al*., 2008; Zahra, 2014). Our results are consistent with Francis *et al*. (2003) who find a positive link between country-level governance quality (i.e., strong investor protection legal framework) and auditing enforcement (i.e., hiring a Big 5 auditor and paying higher audit fees).

Observably (although not the main focus of the study), the control variables also have significant relationships with the dependent variables, as expected. With regard to the association between control variables and auditor choice and audit fees illustrated in Table 4, Models 1 to 8, the study finds mixed results. For example, *LNTA*, *LV*, and *ROA* are positively associated with *BIG4*. Likewise, but with regard to audit fees, *BIG4*, *LNTA,* and *BUSY* are positively associated with *LNFE*, while *LV* and *ROA* are negatively linked to *LNFE* (i.e., payment of low audit fees). In summary, the empirical results, in general, suggest that external audit quality in MENA countries are affected by firm- and country-level governance quality, which indicates that governance quality and external audit quality (i.e., hiring a Big 4 auditor and paying high audit fees) are complements in playing the monitoring role in MENA countries.

5.3. Additional analysis and sensitivity checks

The purpose of this section is to extend our analysis of the impact of firm- and country-level governance quality on audit quality in MENA countries and to examine the robustness of the regression models and the empirical results of our study. For example, we examine the substitutional or complementary effect of firm- and country-level governance quality on audit quality. We re-estimate Eq. 1 and 2 by including the board governance index (*BRDGI*), shareholding governance index (*SHRGI*), national governance index (*NGI*), and interaction terms (*BRDGI*NGI*) and (*SHRGI*NGI*). The results are reported in Models 1 and 2 of Table 6. The results show that the coefficient for *SHRGI*NGI* is positive and significant at the 5% level, suggesting that the shareholding governance quality appears to complement the country-level governance quality in engaging high audit quality (LNFE).

Second, we use alternative proxy to measure audit quality. We employ the audit report lag (*ARLAG)* measured as the number of days between the end of the fiscal year and the audit report date. Model 3 of Table 6 indicates that *BRDS*, *UBL,* and *GOSH* have a positive and significant effect on *ARLAG,* while *IND* has a negative and significant link with *ARLAG*. These results indicate that board size, board independence, board leadership structure, and government ownership determine audit quality (*ARLAG*). These results are mostly in line with prior studies from MENA countries (e.g., Afify, 2009). Third, we use audit fees deflated by total assets (*AF/TA*), following previous studies (e.g., Simunic 1980), as alternative proxy to measure audit fees. The results reported in Model 4 of Table 6 show that firms with large board size, separate board chairperson/CEO roles, and low family shareholdings pay higher audit fees. Fourth, we use alternative proxies to measure the control variables. We employ the log of revenues (*LNTS*) to proxy for firm size, the current ratio (*CURRENT*) to proxy for firm-level risk, the market-to-book value of equity ratio (*MTB*) to proxy for firm growth opportunity, and the return on equity (*ROE*) to proxy for profitability. Models 5 and 6 of Table 6 show that our results documented in Models 3 and 7 of Table 4 are mostly insensitive to the use of alternative control variables.

Fifth, a number of previous studies suggest that some of the corporate board characteristics (e.g., board size) and shareholding structure mechanisms (e.g., government, director, and family shareholding) have non-linear relationship with financial reporting and audit quality (e.g., Chau & Leung, 2006; Elmagrhi *et al*., 2016; Barroso *et al.,* 2018). This suggests that the extent of external auditing and ultimately the auditor choice and audit fees may have a nonlinear association with board characteristics and shareholding structure mechanisms (O'Sullivan, 2000). To identify the existence

of non-linear relationship between *BRDS*, *GOSH*, *DISH,* and *FLSH* on the one hand, and *BIG4* and *LNFE* on the other hand, Models 3 and 7 of Table 4 have been re-estimated by adding the square root of *BRDS, GOSH, DISH, and FLSH*. The findings are reported in Models 7 and 8 of Table 6. The results generally indicate that there is a nonlinear relationship between government and director shareholding, and auditor choice decision, which suggests that entrenched government shareholding and director shareholding have access to private information. Therefore, they have lower incentives to demand external auditing services/hiring high-quality auditor to monitor managers (Niemi, 2005; Ho & Kang, 2013).

[Insert table 5 about here]

Sixth, in line with the suggestions of Lin and Liu (2010), we estimate a lagged governance quality–audit quality connection in order to resolve the existence of a potential simultaneous relationship between governance quality and audit quality. Eq. 1 and 2 are re-estimated by introducing a 1-year lag between governance quality and audit quality. In general, the findings presented in Models 1 and 2 of Table 7 support the robustness of the results reported in Models 3 and 7 of Table 4 on the influence of lagged effect. Seventh, in order to test the sensitivity of our findings to the use of a different measure of auditor quality (instead of *BIG4*), we use another proxy that captures that the auditor being a part of an international network and thus arguably subject to greater regulatory processes and requirements that are associated with being a part of such a network (Al-Ajmi, 2009; Samaha & Hegazy, 2010; El-Dyasty, 2017). This alternative audit firm quality (*IAF*) is a dummy variable that takes the value of 1 if a firm is audited by audit firm that is part of an international network, including Big 4 audit firms (PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, and KPMG), 0 otherwise. Generally, the findings presented in Models 3 and 4 of Table 7 are largely similar to our results reported in Models 3 and 7 of Table 4.

The eighth sensitivity test is related to the suggested moderating effect of client size on the relationship between firm- and country-level governance quality, and audit quality (Carcello *et al.*, 2002). Following Carcello *et al.* (2002), the study sample was split at the median to test Eq. 1 and 2 within each subset of the data. In general, Models 5 to 8 of Table 7 support that our findings are insensitive to differences in firm size. Finally, to consider the economic development in each country, we adopted the approach of Chung and Narasimhan (2002) by adjusting the exchange rates in the US dollars with the country's Purchasing Power Parity (PPP) (obtained from the World Bank). Model 9 in Table 7 shows that board size, board independence, director shareholding, and country-level governance quality have significant positive effect on audit fees, while family shareholding has

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significant negative link with audit fees. This is in line with our previous findings reported in Model 7 of Table 4.

[Insert table 6 about here]

In conclusion, a number of additional tests were conducted to examine the robustness of the regression models and the empirical results. Overall, the findings are fairly robust across these econometric models and generally consistent with the predictions of agency theory.

5. Summary and Conclusions

The audit profession in MENA countries is less established when compared to developed countries. There is often no effective code of professional ethics governing accountants' and auditors' work and practice, and no powerful professional organisations responsible for the development of the auditing profession. However, MENA countries have recently experienced a rapid shift in economic development. In particular, there is a strong presence of multinational firms and international financial institutions, requiring better protection of their investments through better-quality audit performed by higher reputable auditors. Therefore, the purpose of this study is to examine the impact of firm- and country-level governance structures on audit quality, as measured by auditor choice and audit fees in 5 selected countries within the MENA region.

Our results indicate that firm- and country-level governance mechanisms affect audit quality in our sample of MENA countries. Specifically, we report that board independence is positively related to engaging a Big 4 auditor, while family shareholdings show a negative relationship with hiring a Big 4 auditor. In addition, we find that board size, board independence, and director shareholdings are positively related to audit fees, while government shareholdings and family shareholdings show a negative relationship with audit fees. Finally, country-level governance quality is positively associated with hiring a Big 4 audit firm and the payment of higher audit fees. Thus, we argue that both firm- and country-level governance structures encourage firms to commit to higher standards of audit quality.

The results of this paper have implications for policy makers and regulators in charge of improving the process of issuing/refining governance codes, regulatory system, and legislative processes that are often aimed at protecting the interests of different stakeholders by promoting higher standards of audit quality. Despite the underdeveloped nature of accounting and auditing profession, MENA countries recently adopted and issued corporate governance codes based on international corporate governance best practices recommendations. Thus, our results support the positive effect of the governance mechanisms on audit quality within the MENA context that encourage

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governments and regulators in the MENA region and other developing countries to issue/reform governance best practices recommendations to protect shareholders' interests. Also, for managers and corporations, our evidence suggests that they may be able to improve their audit quality by hiring more independent directors, as well as encouraging directors to increase their shareholdings.

Finally and like all archival studies of this nature, the current study is subject to a number of limitations. First, the sample is limited to 600 firm year observations from five MENA countries. Thus, future studies may enhance the insights that they may be able to offer by employing a large sample of firms and countries to test these relationships. Second and similar to other archival studies, the variables used as proxies for audit quality and governance mechanisms may or may not reflect actual practice, and hence, future researchers may offer new insights within the MENA context by applying other dimensions of audit quality and governance practices. Third and although this study attempted to control for many factors that previous studies have found to affect audit quality, we have been unable to include other variables because the required data was not available, such as non-audit services and the composition of audit committees. Therefore and as more relevant data becomes available, future studies may attempt to extend our findings by controlling for other factors that may affect audit quality. Finally, the current study conducts only quantitative analysis in investigating the governance antecedents of audit quality in MENA countries. Future studies may offer new insights by conducting in-depth qualitative analysis regarding these issues.

NOTES

1. The MENA region includes Algeria, Bahrain, Djibouti, Egypt, the Islamic Republic of Iran, Israel, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, the United Arab Emirates, West Bank and Gaza, and the Republic of Yemen (http://www.worldbank.org).

2. In UAE, Khalifa (2012) documented that the state has taken the lead role by regulating in some detail the affairs of accounting and auditing professions. However, UAE does not possess an accounting institute that organizes the training and examination of accounting trainees or the approval of their professional designations. Similarly in Egypt, although the Egyptian Society of Accountants and Auditors that was established in 1946 plays a central role in the accounting and auditing profession, however, it does not have the authority to license accountants and auditors or to establish auditing standards (Samaha & Hegazy, 2010).

3. We acknowledge that MENA governance codes recommend both minimum and maximum board size, which might be seen as a limitation for predicting the direction of the relationship between audit quality and board size. In addition, the theoretical and empirical literature provide mixed

results for this association. It is worth noting that our robustness tests tried to minimise if not eliminate this limitation.

4. For the purpose of the current study, five countries are selected namely; Egypt, Jordan, Oman, Saudi Arabia, and the UAE. The choice of these specific countries is to satisfy three main criteria. First, in order to ensure data availability and sample homogeneity, some filtering rules were applied. Accordingly, some countries were excluded from the sample. For example, Bahrain and Qatar were dropped because their firms' capital markets include mostly financial and investment corporations (Al-Ajmi, 2009). Countries with non-active stock markets (such as, Iraq and Libya) and did not issue governance code (such as, Kuwait) were excluded. Second, the selected countries should reflect the diversity in MENA countries in order to support the generalization of the results. Specifically, from a capital perspective, whereas Saudi Arabia and the UAE are net capital exporting countries, Egypt and Jordan are considered net capital importing countries (Piesse *et al*., 2012). Oman was the first country in the MENA region to issue its national governance code in 2002. The final selected five countries account for over 58% of the MENA stock market capitalization in 2014. Finally, the selected five countries share a number of common characteristics: (i) they are all have similar accounting, auditing, governance, and legal systems which are derived from the Anglo–Saxon system (Piesse *et al*., 2012; Al-Bassam *et al*., 2018; Khalil & Ozkan, 2016); (ii) they require listed firms to prepare their financial statements in accordance with international accounting standards or national accounting standards that were developed in accordance with the international accounting standards (Wahdan, 2005; Samaha & Hegazy, 2010); and (iii) they have similar cultural characteristics (e.g., a strong hierarchical social structure, importance of personal relationships, religion, accountability, and trust), corporate law, ownership structures (concentrated shareholding dominated by the state and powerful families), and the state of audit profession (auditing profession is directly regulated by the government) (Piesse *et al*., 2012; Al-Bassam *et al*., 2018); thereby permitting comparability of governance and audit quality among firms and across countries.

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Table 1. Summary of variables and measures

Dependent variables	
BIG4	A dummy variable that takes the value of 1 if a firm is audited by a big four audit firm (PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, and KPMG), 0 otherwise.
LNFE	Natural log of audit fee in thousands of US dollars.

Independent/ Firm-level governance variables	
BRDS	Natural log of the total number of directors on the board of a company.
IND	The percentage of non-executive directors to the total number of board directors.
UBL	A dummy variable that takes the value of 1 if the roles of chairperson and CEO of firm are combined at the end of its financial year, 0 otherwise.
GOSH	Percentage of shares held by government.
DISH	Percentage of shares held by board of directors.
FLSH	Percentage of shares held by family members.
Independent/ Country-level governance variables	
NGI	National Governance Index which is the average of the six indices (i.e., voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption).
VOICE	Voice and accountability: measuring perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
POLTC	Political stability and absence of violence/terrorism: measuring perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.
GOVT	Government effectiveness: measuring perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
REGY	Regulatory quality: measuring perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
RLAW	Rule of law: measuring perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
CORN	Control of corruption: measuring perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as ʹcaptureʹ of the state by elites and private interests.
Control variables	
LNTA	Natural log of the total assets in thousands of US dollars of a firm (wc02999).
BUSY	Binary variable =1 if financial year-end is between 31 December and 31 March inclusive;=0 otherwise
QUIK	Quick Ratio (wc08101) is (Cash & Equivalents + Receivables (Net)) / Current Liabilities-Total.
LOS	Binary variable = 1 if the firm incurred a loss in the previous year, 0 otherwise.
LV	Percentage of total debt (wc03255) to total assets (wc02999) in a financial year
SGR	Percentage of current year's sales (wc01001) minus previous year's sales scaled by previous year's sales.
ROA	Percentage of operating profit (wc01250) to total assets (wc02999) in a financial year.
YDU	Dummies for the years 2009 to 2014 inclusive.
IRY	Dummies for each of the eight main industries: basic materials; oil & gas, industrial, customer goods, customer services, health care, technology, and telecommunication.

Table 2. Summary of descriptive statistics of all variables for all sampled firms

Variables	Mean	Median	STD	Minimum	Maximum	VIF
Panel A: Dependent variables						
BIG4%	59	100	49.30	0	100	1.64

LNFE ($ 000)	49.35	23.61	82.31	4.06	865.79	-
Panel B: Independent/ Governance variables						
BRDS	8.52	9	2.59	4	19	1.56
IND%	87.43	88.89	14.03	40	100	2.09
UBL%	21	0	40.90	0	100	2.12
GOSH%	16.15	3.29	24.60	0	98.67	2.12
DISH%	44.94	47.89	27.90	0	98.92	2.08
FLSH%	49.85	47.06	28.39	1.08	100	2.28
NGI %	49.37	49.71	13.24	21.87	71.03	2.33
Panel C: Firm control variables						
LNTA ($000,000)	2089.75	184.45	5728.52	3.45	35222.66	2.69
BUSY%	95	100	22.50	0	100	1.54
QUIK%	139.71	100	132.88	10	967	2.31
LOS%	16	0	36.40	0	100	1.35
LV%	20.38	17.99	17.65	0	69.75	2.22
SGR%	9.06	6.01	45.46	-92.59	594.06	1.29
ROA%	6.56	6.11	7.76	-32.09	31.03	1.63

See Table 1 for variables' definitions

Table 3. Pearson and Spearman correlation matrices of all variables

	BIG4	LNFE	BRDS	IND	UBL	GOSH	DISH	FLSH	NGI	LNTA	BUSY	QUIK	LOS	LV	SGR	ROA
BIG4	1	0.468***	0.150***	0.339***	-0.296***	0.350***	0.154***	-0.299***	0.151***	0.482***	0.178***	0.040	-0.133***	0.225***	0.104**	0.174***
LNFE	0.467***	1	0.146***	0.314***	-0.337***	0.365***	0.025	0.283***	0.440***	0.721***	0.203***	0.037	-0.071	0.191***	0.011	-0.050
BRDS	0.135***	0.175***	1	0.011	0.243***	0.273***	0.093**	-0.035	-0.270***	0.355***	0.010	-0.011	-0.083**	0.016	0.099**	0.077*
IND	0.352***	0.340***	0.029	1	-0.448***	0.226***	0.107***	-0.271***	0.431***	0.128***	0.083**	0.132***	-0.043	0.026	0.029	0.158***
UBL	-0.296***	-0.353***	0.249***	-0.435***	1	-0.023	0.068*	0.091**	-0.434***	-0.196***	-0.240***	-0.155***	-0.021	-0.087**	0.013	-0.012
GOSH	0.238***	0.312***	0.167***	0.062	-0.027	1	0.206***	-0.440***	0.049	0.547***	-0.218***	0.121***	-0.183***	-0.009	0.05	0.137***
DISH	0.145***	0.031	0.107***	0.022	0.072*	0.273***	1	-0.607***	-0.124***	0.125***	-0.202***	-0.064	-0.188***	0.078*	0.105***	0.255***
FLSH	-0.315***	-0.310***	-0.060	-0.223***	0.095**	-0.470***	-0.597***	1	-0.071*	-0.281***	0.196***	-0.078*	0.129***	-0.011	-0.048	-0.205***
NGI	0.150***	0.403***	-0.271***	0.390***	-0.468***	0.033	-0.192***	-0.023	1	0.016	0.141***	0.296***	-0.081**	-0.004	-0.068*	0.065
LNTA	0.482***	0.720***	0.352***	0.118***	-0.204***	0.529***	0.137***	-0.305***	0.047	1	0.081**	-0.062	-0.166***	0.298***	0.156***	0.066
BUSY	0.178***	0.205***	-0.016	0.202***	-0.240***	-0.277***	-0.212***	0.194***	0.164***	0.086**	1	0.003	0.102**	0.137***	-0.004	-0.032
QUIK	0.043	0.046	-0.010	0.148***	-0.157***	0.138***	-0.066	-0.088**	0.300***	-0.071*	-0.030	1	-0.235***	-0.573***	0.044	0.267***
LOS	-0.133***	-0.063	-0.102**	-0.005	-0.021	-0.164***	-0.190***	0.129***	-0.076*	-0.146***	0.102**	-0.239***	1	0.096**	-0.089**	-0.475***
LV	0.212***	0.144***	0.026	0.038	-0.080**	-0.053	0.063	-0.017	-0.014	0.329***	0.137***	-0.530***	0.132***	1	0.036	-0.169***
SGR	0.110***	0.019	0.094**	0.032	0.012	0.029	0.113***	-0.074*	-0.073*	0.172***	-0.012	0.031	-0.076*	0.047	1	0.290***
ROA	0.158***	-0.037	0.086**	0.094**	0.001	0.046	0.233***	-0.197***	0.044	0.053	-0.015	0.246***	-0.442***	-0.209***	0.274***	1

See Table 1 for variables' definitions.

The bottom half of the table contains Person's parametric correlation coefficients, whereas the upper right half of the table shows Spearman's non-parametric correlation coefficients. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4. Firm-level antecedents of audit quality

(Model)	BIG4 1	BIG4 2	BIG4 3	BIG4 4	LNFE 5	LNFE 6	LNFE 7	LNFE 8
BRDS	0.037	-	0.264	-	0.292***	-	0.350***	-
	(0.934)		(0.572)		(0.002)		(0.001)	
IND	4.662***	-	3.971***	-	0.581***	-	0.536**	-
	(0.000)		(0.000)		(0.009)		(0.014)	
UBL	-0.429	-	-0.445	-	-0.017	-	0.021	-
	(0.216)		(0.213)		(0.830)		(0.788)	
BRDGI	-	-	-	3.294***	-	-	-	0.262
				(0.000)				(0.150)
GOSH	-	-1.004	-0.526	-	-	-0.314**	-0.264*	-
		(0.109)	(0.437)			(0.028)	(0.062)	
DISH	-	-0.736	-0.373	-	-	0.262**	0.288**	-
		(0.164)	(0.500)			(0.041)	0.023	
FLSH	-	-2.058***	-1.413**	-	-	-0.327***	-0.323**	-
		(0.000)	(0.011)			(0.008)	(0.013)	
SHRGI	-	-	-	0.010	-	-	-	0.401***
				(0.979)				(0.000)

Control variables

	BIG4 1	BIG4 2	BIG4 3	BIG4 4	LNFE 5	LNFE 6	LNFE 7	LNFE 8
BIG4	-	-	-	-	0.217***	0.220***	0.199***	0.266***
					(0.000)	(0.000)	(0.001)	(0.000)
LNTA	0.615***	0.584***	0.596***	0.580***	0.318***	0.338***	0.317***	0.332***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BUSY	-	-	-	-	0.374***	0.478***	0.437***	0.387***
					(0.000)	(0.000)	(0.000)	(0.000)
QUIK	0.158	0.195*	0.134	0.183	0.002	0.017	0.017	0.014
	(0.180)	(0.098)	(0.267)	(0.117)	(0.934)	(0.541)	(0.542)	(0.615)
LOS	-0.019	0.049	-0.019	-0.029	0.031	0.063	0.052	0.065
	(0.953)	(0.884)	(0.956)	(0.929)	(0.685)	(0.419)	(0.497)	(0.395)
LV	2.584***	3.466***	2.656***	2.963***	-0.316	-0.402*	-0.329	-0.392*
	(0.000)	(0.000)	(0.008)	(0.002)	(0.126)	(0.053)	(0.110)	(0.057)
SGR	-0.026	0.033	-0.036	0.033	0.024	-0.010	-0.002	0.001
	(0.923)	(0.902)	(0.897)	(0.900)	(0.687)	(0.867)	(0.969)	(0.992)
ROA	4.788***	3.876**	4.282**	4.771***	-1.392***	-1.536***	-1.688***	-1.398***
	(0.004)	(0.019)	(0.012)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
NGI	-0.640	1.790*	-0.367	0.103	2.368***	2.571***	2.763***	2.267***
	(0.564)	(0.055)	(0.750)	(0.918)	(0.000)	(0.000)	(0.000)	(0.000)
YDU	Included	Included	Included	Included	Included	Included	Included	Included
IRY	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-12.417***	-7.726***	-11.222***	-11.147***	4.025***	5.042***	3.963***	4.810***
F-value	-	-	-	-	49.07***	49.48***	46.33***	51.50***
Chi-square	288.21***	272.52***	295.93***	273.45***	-	-	-	-
Adjusted R^2	-	-	-	-	71.10%	71.27%	72.29%	71.24%
Pseudo R2	35.45%	33.52%	36.40%	33.64%	-	-	-	-
No. of obs.	600	600	600	600	470	470	470	470

Variables' definitions: Board governance index (BRDGI), shareholding governance index (SHRGI). See Table 1 for variables' definitions.

Ordinary least squares coefficients, logit regression coefficients and two-tailed p-values are shown. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Country-level antecedents of audit quality

(Model)	BIG4 1	BIG4 2	BIG4 3	BIG4 4	BIG4 5	BIG4 6	BIG4 7	LNFE 8	LNFE 9	LNFE 10	LNFE 11	LNFE 12	LNFE 13	LNFE 14
VOICE	0.670	-	-	-	-	-	-	3.937***	-	-	-	-	-	-
	(0.645)							(0.000)						
POLTC	-	1.806***	-	-	-	-	-	-	1.182***	-	-	-	-	-
		(0.000)							(0.000)					
GOVT	-	-	1.165*	-	-	-	-	-	-	1.792***	-	-	-	-
			0.083							(0.000)				
REGY	-	-	-	1.774**	-	-	-	-	-	-	2.094***	-	-	-
				(0.044)							(0.000)			
RLAW	-	-	-	-	1.430	-	-	-	-	-	-	2.503***	-	-
					(0.176)							(0.000)		
CORN	-	-	-	-	-	0.913	-	-	-	-	-	-	2.023***	-
						(0.208)							(0.000)	
NGI	-	-	-	-	-	-	2.065**	-	-	-	-	-	-	2.379***
							(0.020)							(0.000)

Control variables

	BIG4 1	BIG4 2	BIG4 3	BIG4 4	BIG4 5	BIG4 6	BIG4 7	LNFE 8	LNFE 9	LNFE 10	LNFE 11	LNFE 12	LNFE 13	LNFE 14
BIG4	-	-	-	-	-	-	-	0.362***	0.209***	0.287***	0.260***	0.274***	0.305***	0.263***
								(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LNTA	0.572***	0.554***	0.556***	0.574***	0.576***	0.559***	0.570***	0.357***	0.317***	0.312***	0.343***	0.363***	0.315***	0.329***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BUSY	-	-	-	-	-	-	-	0.486***	0.561***	0.432***	0.500***	0.487***	0.383***	0.451***
								(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
QUIK	0.311***	0.247**	0.252**	0.242**	0.271**	0.270**	0.225**	0.016	0.018	0.008	0.026	0.034	0.004	0.005
	(0.004)	(0.031)	(0.027)	(0.033)	(0.016)	(0.017)	(0.049)	(0.659)	(0.549)	(0.769)	(0.371)	(0.235)	(0.894)	(0.851)
LOS	0.083	0.137	0.096	0.084	0.089	0.077	0.093	-0.013	0.074	0.053	0.039	0.046	0.026	0.049
	(0.796)	(0.673)	(0.765)	(0.793)	(0.781)	(0.810)	(0.771)	(0.884)	(0.364)	(0.500)	(0.624)	(0.567)	(0.731)	(0.529)
LV	3.780***	3.141***	3.498***	3.422***	3.551***	3.579***	3.347***	0.034	-0.280	-0.328	-0.274	-0.270	-0.359*	-0.351*
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.882)	(0.197)	(0.116)	(0.201)	(0.209)	(0.081)	(0.093)
SGR	-0.001	0.061	0.035	0.042	0.026	0.030	0.059	0.015	-0.013	0.006	0.021	0.028	0.029	0.019
	(0.998)	(0.814)	(0.893)	(0.871)	(0.919)	(0.908)	(0.820)	(0.822)	(0.841)	(0.915)	(0.741)	(0.653)	(0.628)	(0.759)
ROA	4.462***	4.481***	4.665***	4.345***	4.327***	4.591***	4.532***	-1.271***	-1.427***	-0.962**	-1.501***	-1.570***	-0.874**	-1.207***
	(0.005)	(0.005)	(0.004)	(0.007)	(0.007)	(0.004)	(0.005)	(0.004)	(0.000)	(0.015)	(0.000)	(0.000)	(0.025)	(0.002)
YDU	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
IRY	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-8.831***	-8.598***	-8.891***	-9.359***	-9.406***	-8.867***	-9.276***	4.597***	5.805***	5.461***	4.817***	4.278***	5.271***	5.111***
F-value	-	-	-	-	-	-	-	39.00***	47.61***	52.94***	49.08***	48.74***	55.34***	53.08***
Chi-square	250.03***	263.66***	252.86***	253.94***	251.67***	251.41***	255.31***	-	-	-	-	-	-	-
Adjusted R^2	-	-	-	-	-	-	-	62.99%	67.61%	69.93%	68.28%	68.13	70.87%	69.99%
Pseudo R2	30.76%	32.43%	31.10%	31.24%	30.96%	30.93%	31.40%	-	-	-	-	-	-	-
No. of obs.	600	600	600	600	600	600	600	470	470	470	470	470	470	470

See Table 1 for variables' definitions.

Ordinary least squares coefficients, logit regression coefficients and two-tailed p-values are shown. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Sensitivity analyses (PART1)

Ind. var./ Model	Interaction variables		Audit report lag	AF/TA	Alternative control variables		Linearity	
	Big4	LNFE	ARLAG		Big4	LNFE	Big4	LNFE
	1	2	3	4	5	6	7	8
BRDS			0.236***	0.310**	0. 267	0.622***	-	-
			(0.001)	(0.046)	(0.586)	(0.000)		
BRDS²			-	-	-	-	-0.007	0.077***
							(0.951)	(0.001)
IND			-0.319**	-0.458	4.762***	0.183	3.731***	0.299
			(0.048)	(0.219)	(0.000)	(0.473)	(0.001)	(0.187)
UBL			0.166***	-0.232*	-0.509	-0.083	-0.285	0.033
			(0.005)	(0.065)	(0.170)	(0.334)	(0.439)	(0.672)
BRDGI	4.349***	0.145			-	-	-	-
	(0.000)	(0.489)						
GOSH			0.439***	-0.083	-0.667	0.173	-	-
			(0.000)	(0.717)	(0.315)	(0.254)		
GOSH²			-	-	-	-	-2.060**	-0.549***
							(0.033)	(0.002)
DISH			-0.082	-0.179	-0.228	0.228	-	-
			(0.346)	(0.383)	(0.700)	(0.106)		
DISH²			-	-	-	-	-1.424**	0.268**
							(0.018)	(0.031)
FLSH			-0.040	-0.380*	-1.465**	-0.352**	-	-
			(0.656)	(0.073)	(0.014)	(0.016)		
FLSH²			-	-	-	-	-2.309***	-0.353***
							(0.000)	(0.004)
SHRGI	0.017	0.357***			-	-	-	-
	(0.964)	(0.000)						
NGI	-0.150	2.255***	0.307	0.227*	-0.848	3.275***	-1.042	2.702***
	(0.884)	(0.000)	(0.750)	(0.057)	(0.487)	(0.000)	(0.391)	(0.000)
BRDGI*NGI	8.156	-1.975	-	-	-	-	-	-
	(0.255)	(0.196)						
SHRGI*NGI	1.819	1.694**	-	-	-	-	-	-
	(0.555)	(0.025)						
Control variables								
BIG4		0.262***	0.282***	0.166*	-	0.234***	-	0.182***
		(0.000)	(0.000)	(0.091)		(0.001)		(0.003)
LNTA	0.561***	0.3456***	-0.042***	0.232***	-	-	0.621***	0.323***
	(0.000)	(0.000)	(0.004)	(0.000)			(0.000)	(0.000)
BUSY		0.332***	0.029	0.437**	-	0.462***	-	0.403***
		(0.003)	(0.755)	(0.020)		(0.000)		(0.000)
QUIK	0.161	0.004	-0.024	0.237***	-	-	0.120	0.020
	(0.172)	(0.885)	(0.183)	(0.000)			(0.329)	(0.465)
LOS	-0.001	0.044	0.063	-0.228*	0.449	0.027	-0.119	0.044
	(0.997)	(0.573)	(0.261)	(0.066)	(0.213)	(0.750)	(0.732)	(0.558)
LV	2.861***	-0.424**	0.080	0.586*	2.143**	-0.499**	2.571***	-0.326
	(0.003)	(0.039)	(0.580)	(0.079)	(0.043)	(0.028)	(0.010)	(0.109)
SGR	0.013	-0.006	-0.013	-0.058	-	-	-0.039	-0.006
	(0.963)	(0.921)	(0.760)	(0.548)			(0.890)	(0.921)
ROA	5.259***	-1.332***	-1.346***	-1.373**	-	-	3.362**	-1.686***
	(0.002)	(0.001)	(0.000)	(0.030)			(0.050)	(0.000)
LNTS	-	-	-	-	0.741***	0.231***	-	-
					(0.000)	(0.000)		
CURRENT	-	-	-	-	0.172**	-0.046**	-	-
					(0.038)	(0.016)		
MTB	-	-	-	-	-0.024*	-0.002	-	-
					(0.082)	(0.572)		
ROE	-	-	-	-	1.175	-1.124***	-	-
					(0.184)	(0.000)		
YDU	Included	Included	Included	Included	Included	Included	Included	Included
IRY	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-11.956**	4.881***	3.895***	2.938***	-12.451***	4.484***	-10.011***	4.502***
F-value	-	47.84***	6.06	6.15	-	35.20***	-	47.33***
Chi-square	275.32***	-	-	-	330.22***	-	312.17***	-
Adjusted R²	-	71.40%	18.58	22.85	-	66.31%	-	72.73%
Pseudo R2	33.87%	-	-	-	40.62%	-	38.40%	-
No. of observations	600	470	600	470	600	470	600	470

Variables' definitions: Audit report lag (ARLAG), Audit fees divided by total assets (AF/TA), board size squared (BRDS²), government shareholding squared (GOSH²), director shareholding squared (DISH²), family shareholding squared (FLSH²), log of revenues (LNTS), current ratio (CURRENT), market to book value (MTB), and return on equity (ROE). See Table 1 for other variables' definitions.

Ordinary least squares coefficients, logit regression coefficients and two-tailed p-values are shown. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Sensitivity analyses (PART2)

Ind. var./ Model	Lagged		Alternative Auditor size		Small size firms		Large size firms		PPP
	Big4	LNFE	IAF	LNFE	Big4	LNFE	Big4	LNFE	LNFE-P
	1	2	3	4	5	6	7	8	9
BRDS	-0.213	0.337***	0.156	0.327***	0.744	0.518***	-0.491	0.403***	0.219**
	(0.679)	(0.001)	(0.767)	(0.000)	(0.245)	(0.001)	(0.672)	(0.004)	(0.023)
IND	4.392***	0.493*	5.819***	0.247	5.993***	0.314	5.906***	0.769**	0.534**
	(0.000)	(0.051)	(0.000)	(0.267)	(0.003)	(0.371)	(0.001)	(0.048)	(0.022)
UBL	-0.024	0.062	0.411	-0.013	0.174	0.007	-2.481**	0.257*	-0.077
	(0.952)	(0.456)	(0.281)	(0.862)	(0.718)	(0.949)	(0.035)	(0.071)	(0.327)
GOSH	-0.529	-0.289*	2.907***	-0.405***	1.159	-0.432	1.280	-0.198	-0.159
	(0.481)	(0.059)	(0.001)	(0.004)	(0.375)	(0.211)	(0.319)	(0.261)	(0.259)
DISH	-0.755	0.338**	-0.072	0.303**	-1.066	0.030	1.446	0.619***	0.321**
	(0.239)	(0.015)	(0.901)	(0.014)	(0.206)	(0.879)	(0.140)	(0.002)	(0.013)
FLSH	-1.595**	-0.253*	0.425	-0.359***	-3.367***	-0.426**	2.255*	-0.404*	-0.362***
	(0.013)	(0.083)	(0.489)	(0.005)	(0.000)	(0.021)	(0.060)	(0.077)	(0.006)
NGI	-0.501	3.022***	-1.102	2.844***	-3.740**	1.542***	1.434	3.868***	3.511***
	(0.713)	(0.000)	(0.353)	(0.000)	(0.047)	(0.000)	(0.531)	(0.000)	(0.000)
Control variables									
BIG4	-	0.207***		-	-	0.199**	-	0.174	0.219***
		(0.002)				(0.015)		(0.154)	(0.000)
IAF				0.392***					
				(0.000)					
LNTA	0.650***	0.321***	-0.064	0.344***	0.415**	0.377***	1.378***	0.293***	-
	(0.000)	(0.000)	(0.535)	(0.000)	(0.024)	(0.000)	(0.001)	(0.000)	
LNTA-P	-	-	-	-	-	-	-	-	0.277***
									(0.000)
BUSY	-	0.454***	-	0.341***	-	0.528***	-	0.296	0.270**
		(0.000)		(0.003)		(0.002)		(0.111)	(0.020)
QUIK	0.103	0.022	-0.045	0.014	-0.036	0.125***	0.651**	-0.057	0.026
	(0.439)	(0.454)	(0.733)	(0.596)	(0.822)	(0.003)	(0.027)	(0.166)	(0.333)
LOS	-0.121	0.024	0.085	0.055	-0.413	0.046	1.784*	0.142	-0.033
	(0.744)	(0.774)	(0.823)	(0.459)	(0.304)	(0.647)	(0.065)	(0.267)	(0.663)
LV	2.438**	-0.365*	3.431***	-0.427**	0.073	-0.171	3.694	-0.119	-0.302
	(0.029)	(0.098)	(0.003)	(0.035)	(0.956)	(0.590)	(0.121)	(0.696)	(0.139)
SGR	-0.029	0.072	-0.108	-0.012	-0.171	-0.029	-0.428	-0.001	0.017
	(0.925)	(0.253)	(0.716)	(0.837)	(0.638)	(0.736)	(0.404)	(0.993)	(0.767)
ROA	5.552***	-1.911***	5.267***	-1.759***	2.373	-1.945***	11.219***	-1.937***	-0.774*
	(0.004)	(0.000)	(.005)	(0.000)	(0.289)	(0.000)	(0.006)	(0.006)	(0.059)
YDU	Included	Included	Included	Included	Included	Included	Included	Included	Included
IRY	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-10.886***	2.941***	-4.403**	3.542***	-6.878***	3.910***	-22.007***	2.618***	4.841***
F-value	-	42.63***	-	49.52***	-	10.81***	-	18.82***	171.54***
Chi-square	253.69***	-	124.75***	-	92.32***	-	157.51***	-	-
Adjusted R^2	-	73.41%	-	73.64%	-	52.14%	-	67.28%	91.34%
Pseudo R2	37.52%	-	22.54	-	22.96%	-	50.23%	-	-
No. of observations	600	470	600	470	300	235	300	235	470

Variables' definitions: International audit firm network (IAF), Natural log of audit fees in thousands of dollars adjusted by Purchasing Power Parity (LNFE-P), Natural log of the total assets in thousands of dollars adjusted by Purchasing Power Parity (LNTA-P). See Table 1 for other variables' definitions.

Ordinary least squares coefficients, logit regression coefficients and two-tailed p-values are shown. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.