The role of audit quality in firm valuation

Evidence from an emerging capital market with a joint audit requirement

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Abstract

Purpose – The purpose of this paper is to examine the effect of audit quality on the value relevance of earnings and book value. Because joint audit is mandated for all Kuwait Stock Exchange-listed firms, it is hypothesized that the higher the quality of the audit team (as measured by the number of Big 4 audit firms in the joint audit team), the higher the value relevance of earnings and book values for equity valuation.

Design/methodology/approach – Consistent with prior research, the value relevance of earnings and book value is measured by the adjusted R^2 derived from the Ohlson's 1995 regression model. The number of Big 4 audit firms represented on the firm's audit team is used as a proxy for audit quality. Three tiers of audit quality exist, namely, two non-Big 4 audit firms, one Big 4 and one non-Big 4 audit firms or two Big 4 audit firms. To address this paper's objective, the association between audit quality and the value relevance of earnings and book value were examined using four approaches. The final sample consists of 1,836 firm-year observations and covers fiscal years from a 12-year period (2002-2013).

Findings – Taken together, the four approaches used collectively provide empirical evidence that audit quality positively and significantly affects the value relevance of accounting measures to market participants. Importantly, the results reveal significant variations in the value relevance of earnings and book value jointly across the three possible auditor combinations.

Research limitations/implications – Although using auditor size as a proxy for audit quality is well established in the auditing literature, a limitation of that proxy is that it measures audit quality dichotomously, which implicitly assumes a homogeneous level of audit quality within each group.

Practical implications – The findings show the importance of high-quality and rigorous external audits in improving the value relevance of accounting information.

Originality/value – This study contributes to the extent literature on audit quality by exploring the role of audit quality in a unique institutional setting that imposes mandatory joint audits. Although prior studies have investigated the effect of joint audit pair choice on earnings management and audit fee premium, this study is the first to investigate the effect of joint audit pair choice on the value relevance of accounting information.

Keywords Emerging markets, Audit quality, Firm valuation, Joint audit

Paper type Research paper

JEL classification – M41, M42

1. Introduction

During the past four decades, capital market research in accounting has witnessed explosive growth in the number of studies examining the value relevance of financial reporting. Value relevance research empirically investigates the usefulness of financial statements in equity valuation. According to the International Accounting Standards Board (IASB), financial information is *relevant* when it is capable of making a difference in the decisions made by users. Financial information is capable of making a difference in decisions if it has predictive value, confirmatory value or both (IASB, 2014). Francis *et al.* (2004) identify seven different market and accounting-based attributes of accounting quality: accrual quality, persistence, value relevance, timeliness, predictability, smoothness and conservatism. Francis *et al.* (2004) find that value relevance, even if not the only attribute, is one of the most important market-based attributes of accounting quality that dominates the timeliness and conservatism attributes. The findings of Francis *et al.* (2004) support the standpoint of Barth *et al.* (2008), who claim that higher quality accounting information results in less earnings management, more timely loss recognition and more value relevant earnings and equity book values. Barth *et al.* (2001) claim that value relevance research is not only important for investors but also provides useful insights into accounting matters for standard setters and other users. The seminal work of Ball and Brown (1968), an extensive body of empirical research, has comprehensively documented the value relevance of accounting information to investors in mature and emerging financial markets (Barth and Clinch, 1996; Collins *et al.*, 1997; Bao and Chow, 1999; Francis and Schipper, 1999; Barth *et al.*, 2001; Bartov *et al.*, 2005; Alfraih, 2009; Filip and Raffournier, 2010; and Veith and Werner, 2014).

In addition to the quality accounting standards used, several institutional factors may affect value relevance and may do so to a greater extent than accounting standards (Tsalavoutas and Dionysiou, 2014). Bushman and Piotroski (2006), Habib and Azim (2008) and Tsalavoutas and Dionysiou (2014) highlight the importance of firm-specific factors in shaping the value relevance of accounting numbers. Thus, a complete understanding of the properties of accounting numbers must incorporate the influence of firm-specific factors. Audit quality is often considered an important determinate of the value relevance of accounting information in the investment decision-making process. DeFond and Zhang (2014) define higher audit quality as greater assurance of high financial reporting quality. Audit quality improves financial statement quality by increasing the credibility of financial statements. Thus, audit quality is a crucial component of financial reporting quality (DeFond and Zhang, 2014).

Prior empirical research strongly suggests that high audit quality adds value to market participants by providing assurance that financial statements faithfully reflect a company's underlying economics (DeFond and Zhang, 2014). A survey conducted by the Institute of Certified Financial Analysts (ICFA) – a global association of investment professionals with more than 100,000 members in over 135 countries – shows that 72 per cent of respondents said the auditor's report is important to their analysis and use of financial reports in the investment decision-making process (ICFA, 2010). Lee and Lee (2013) argue that high quality audits ensure that a client's financial statements are more useful in reflecting economic performance, and hence higher audit quality may improve the value relevance of financial statement information. Habib *et al.* (2014) suggest that high-quality auditors constrain opportunistic earnings management and increase the informativeness of earnings and its

components. Similarly, Titman and Trueman (1986) suggest that high audit quality would improve the reliability of accounting information and allow investors to make a more precise estimate of a firm's value.

In his speech about the quality of public company audits, Michel Prada, Chairman of the International Financial Reporting Standards (IFRS) Foundation Trustees, claims that audit quality has become a global issue for standard setters, regulators and investors. He argues that investors rely on the financial statements provided by public firms when making investment decisions. However, Prada claims that auditors are vested with the essential responsibility of bestowing relevance and credibility upon such statements. If auditors fail to deliver high-quality audits, investor confidence may plummet, leading to negative consequences for capital markets and local economies (Prada, 2007). Behn *et al.* (2008) suggest that higher audit quality contributes to more informative financial information and allows analysts to make more precise estimate of a firm's value. The notion of Behn *et al.* (2008) is supported by Sayyar *et al.* (2014), who claim that higher audit quality is associated with an increase in the transparency of financial reporting.

The paper is motivated by two primary considerations. First, although the theoretical and empirical literature includes studies related to audit quality and value relevance of earnings and book value of equity, there is limited research on the effect of audit quality on the firm valuation in emerging markets. Second, since 1995, firms listed on the Kuwait Stock Exchange (KSE) have been obligated to be audited by two different external audit firms. This requirement distinguishes the Kuwaiti accounting environment from that of countries with more developed economies where only one external auditor is required. Consequently, the combination of audit firms that companies may use falls into three different possibilities: joint audits by two Big 4 audit firms, joint audits by one Big 4 audit firm paired with a smaller local firm and joint audits by two local audit firms. Consequently, Kuwait's distinctive financial reporting setting provides an interesting context in which to examine the consequences of joint audit and audit quality on firm valuation.

This study aims to contribute to existing value relevance literature by investigating the effects of audit quality on the value relevance of financial reporting in a country that imposes mandatory joint audits. To this end, the main purpose of this study is to examine the effect of audit quality on the value relevance of earnings and book value. For the purpose of this study, audit quality is measured by the size of an audit firm. DeAngelo (1981) argues that audit quality is positively related to an audit firm's size, as larger audit firms have well-established reputations, and, therefore, they have more to lose if they fail to report a discovered breach or make errors or misrepresentations in their clients' corporate reports. Because joint audit is mandated for all KSE-listed firms, it is hypothesized that the higher the quality of the audit team (as measured by the number of Big 4 audit firms in the joint audit team), the higher the value relevance of earnings and book values for equity valuation.

Consistent with prior research, the value relevance of earnings and book value is measured by the adjusted R^2 derived from the Ohlson's 1995 regression model. The number of Big 4 audit firms represented on the firm's audit team is used as a proxy for audit quality. Three tiers of audit quality exist: two non-Big 4 audit firms, one Big 4 and one non-Big 4 audit firms or two Big 4 audit firms. To address this paper's objective, the association between audit quality and the value relevance of earnings and book value

were examined using four approaches. The final sample consists of 1,836 firm-year observations and covers fiscal years from a 12-year period (2002-2013).

Taken together, the four approaches used to investigate the role of audit quality in firm valuation collectively provide empirical evidence that audit quality positively and significantly affects the value relevance of accounting measures to market participants. Importantly, the results reveal significant variations in the value relevance of earnings and book value jointly across the three possible auditor combinations. Firms audited by two Big 4 audit firms are generally associated with more value relevant earnings and book values than either firms audited by one Big 4 firm and one non-Big 4 firm or two non-Big 4 audit firms. The results also show that firms audited by one Big 4 firm and one non-Big 4 firm are generally associated with more value relevant earnings and book values than those audited by two non-Big 4 audit firms. The results of interacting earnings with audit quality suggest that the incremental value relevance of earnings is higher when more Big 4 firms audit a company's financial statements. In contrast, no difference in the incremental value relevance of book value is observed across the three possible auditor combinations. These findings show the importance of high-quality and rigorous external audits in improving the value relevance of accounting information. This study contributes to the extent literature on audit quality by exploring the role of audit quality in a unique institutional setting that imposes mandatory joint audits. Although prior study has investigated the effect of joint audit pair choice on earnings management and audit fee premium, the current study is the first to investigate the effect of joint audit pair choice on the value relevance of accounting information.

The paper proceeds as follows. Section 2 discusses the regulatory framework concerning accounting and auditing in Kuwait and its impact on firms listed on the KSE. Section 3 briefly summarizes the related theoretical and empirical literature and posits the hypotheses to be tested. Section 4 discusses the research model and data. Section 5 discusses the empirical results and research findings. The paper concludes in Section 6 with a summary and discussion of results and an outline of the study's major contributions and implications.

2. Regulatory framework of accounting and auditing in Kuwait
2.1 Regulatory framework of accounting
In Kuwait, the evolution of corporate financial reporting began in the early 1960s with the growth of the business sector and the establishment of public corporations. The Kuwaiti government is fully responsible for formulating business regulations, as well as managing and running enforcement agencies that ensure adherence to these regulations. One of the most significant laws governing accounting in Kuwait is the Law of Commercial Companies No. 15/1960. The Ministry of Commerce and Industry (MCI) issued the law on October 19, 1960, to organize the formation of new companies and regulate the administration of existing companies. This law has been amended numerous times over the past 50 years. Although several laws now regulate Kuwait's accounting and auditing profession to various degrees, the Law of Commercial Companies is still considered the primary law governing the accounting and auditing functions of listed companies in Kuwait (Alfraih, 2009).

The MCI law requires companies to provide annual audited balance sheets and profit and loss statements to the MCI and to all shareholders. Within two months of the date on which a company's general shareholders meeting approves its statements, directors are

required to publish their financial statements for the previous financial year and a list providing the names of the directors and auditors in the official gazette. However, the law does not provide guidelines for preparing these statements; it merely states that they must be prepared in accordance with "*generally accepted accounting standards*" to reflect a "*true and fair view*" of the company's position and that a proper book of accounts must be maintained. Furthermore, the law does not define "*generally accepted accounting standards*" or "*true and fair view*".

Due to the ambiguity that the law creates by not specifying a set of accounting standards or a definition of "*true and fair view*", major differences have emerged in the financial disclosures that Kuwaiti companies provide in their financial statements. In an effort to follow generally accepted accounting procedures and provide a true and fair view of company positions, differences in disclosure methods arose as companies adopted the accounting standards of other countries, such as the USA, the United Kingdom or neighboring Arab countries (Shuaib, 1987). In 1983, in response to these discrepancies and in an attempt to standardize accounting practices in Kuwait, the MCI issued Resolution No. 18, which mandated that all companies operating in Kuwait that are listed on the KSE adopt IFRS for financial periods beginning January 1, 1991 (MCI, 2014).

2.2 Regulatory framework of auditing

While listed companies are required to prepare their financial statements in accordance with IFRS, the quality of these accounting standards by themselves is not sufficient to guarantee quality financial reporting. Accounting standards must be effectively enforced (Ball *et al.*, 2003). An independent audit is one of the most important determinants of whether quality accounting standards have been implemented effectively (Glaum and Street, 2003). Habib *et al.* (2014) argue that audits play an important role in serving the public interest by increasing the accountability of managers and reinforcing trust and confidence in financial reporting. In Kuwait, the Law of Commercial Companies and External Auditing Law No. 5/1981 govern the preparation of KSE-listed firms' financial statements. To enforce application of accounting standards and thereby promote the credibility of financial statements, Article 161 of the Commercial Companies Law states that, at the company's general shareholders meeting, the board should appoint at least one external auditor. Auditors are required to conduct audits in accordance with International Standards of Auditing as issued by the International Federation of Accountants.

Recognizing the importance of the role audits play in serving the public interest by increasing the accountability of management and reinforcing trust and confidence in financial reporting, in 1994, the MCI revised the Commercial Companies Law No. 15 to require that KSE-listed companies have at least two external auditors who are from two different audit firms. This requirement is considered one of the unique features of financial reporting in Kuwait, as most countries require only one external auditor. Additionally, Article 161 of the amended Commercial Companies Law No. 15/1960 states that a company listed in or registered with the KSE shall have no fewer than two external auditors, provided that they are from separate audit firms. Ratzinger-Sakela *et al.* (2013) define joint audit as:

> […] an audit in which financial statements are audited by two or more independent auditors in a way that involves: coordination of the audit planning; shared audit effort; cross reviews and mutual quality controls; and issuance of one single auditor's report signed by the auditors who are jointly liable (Ratzinger-Sakela *et al.*, 2013, p. 176).

To be licensed to audit KSE-listed company accounts, the Law of Commercial Companies requires a candidate to be a Kuwaiti national, hold a bachelor's degree in accounting, pass an accounting and auditing examination organized by the MCI and be registered with the MCI. Furthermore, the Law requires auditors to have at least seven years of experience to audit financial institutions and investment companies and a minimum of five years of experience to audit other listed companies. In addition, external auditors should be appointed at a general meeting of shareholders. Similarly, auditors' remuneration must be determined by a general meeting of shareholders. At the end of 2013, there were 55 audit firms operating in Kuwait.

The External Auditing Law No. 5/1981 does not permit foreign audit firms to operate in Kuwait unless they are affiliated with a local firm. As a result, audit firms in Kuwait can be classified into local firms with international affiliations (Big 4) and local firms without such international affiliation (non-Big 4) (Al-Shammari, 2005). The local firms with international affiliations (Big 4) that operate in Kuwait are Deloitte & Touche Al-Fahad Al-Wazzan & Co., Ernst & Young Al Aiban, Al Osaimi & Partners, KPMG Safi Al-Mutawa & Partners and PricewaterhouseCoopers Al-Shatti & Co.

3. Theoretical framework and hypothesis development
3.1 Value relevance of financial reporting
The vital role played by accounting information in the capital market in cannot be over-emphasized in the international arena. Financial reporting serves to provide useful information to facilitate capital flow from international investors as well as show management's stewardship of the resources entrusted to it (Fiador, 2013). The primary objective of value relevance research is to investigate whether the financial statements that companies produce provide investors and other users both high-quality and valuable accounting information that enables them to make informed decisions. The value relevance of accounting information is a major concern for investors, regulators and other users of financial reports and is a popular area of study for accounting researchers. The seminal works of Ball and Brown (1968) and Beaver (1968) have been catalysts for a large number of studies on the value relevance of accounting information. Their studies represent the first attempts to explore the relationship between accounting variables and stock prices. Barth et al. (2001) argue that the key purpose of value relevance research is "to extend our knowledge regarding the relevance and reliability of accounting amounts as reflected in equity values" (Barth et al., 2001, p. 80). Value relevance research examines the association between the stock price as a dependent variable and a set of independent accounting variables. An accounting variable is considered value relevant if it is significantly associated with a dependent variable, such as stock price (Beaver, 2002).

Barth et al. (2001) claim that value relevance research is not only important for investors but also provides useful insight into accounting matters for standard setters and other users. Francis et al. (2004) identify seven desirable attributes of accounting quality: accrual quality, persistence, value relevance, timeliness, predictability, smoothness and conservatism. This suggests that value relevance, even if not the only attribute, is one of the most important attributes of accounting quality. Beaver (2002) notes that value relevance had been a major area of interest in empirical accounting research throughout the previous 25 years. However, Beaver states that "as with other research areas, value relevance research is controversial" (Beaver, 2002, p. 460). For

example, Holthausen and Watts (2001) assess inferences for standard setting in the value relevance literature. The authors argue that it is difficult to draw standard setting inferences from existing literature and claim that much of the value relevance research is motivated by an assumption that financial statements provide inputs to investors' valuations and that equity investors are the dominant users of financial reporting. They argue that this is inconsistent with the view of accounting standard setting regarding the purpose of accounting, which emphasizes all stakeholders. In contrast, Barth *et al.* (2001) present a different view, arguing that value relevance research provides useful insights for standard setters. They contend that although the focus of value relevance research is on investors, the importance of this research to standard setters should not be underestimated.

As well as the importance of accounting institutions for value relevance research, prior research finds significant differences in the properties of accounting information across countries due to differences in institutional and legal settings. For example, Bushman and Piotroski (2006) highlight the importance of institutional factors in shaping accounting numbers, stating that a country's legal system, securities laws and regulations, political, economy and tax systems create incentives that influence the behavior of corporate managers, regulators, investors and other market participants. These incentives shape the characteristics of reported accounting numbers through a complex interaction of accounting standards; legal, regulatory, market and political pressures and reporting discretions exercised by managers.

Habib and Azim (2008) and Tsalavoutas and Dionysiou (2014) highlight the importance of firm-specific factors in shaping the value relevance of accounting numbers. Thus, a complete understanding of the properties of accounting numbers must incorporate the influence of firm-specific factors. Audit quality is often considered an important determinate of the value relevance of accounting information in the investment decision-making process. Titman and Trueman (1986) suggest that high audit quality would improve the reliability of accounting information and allow investors to make more precise estimates of the firm's value. Prior empirical research strongly suggests that high audit quality adds value to market participants by providing assurance that the financial statements faithfully reflect a company's underlying economics (DeFond and Zhang, 2014).

3.2 Audit quality and financial reporting quality
Audit quality has been the focus of the majority of the audit research over the past 15 years (DeFond and Zhang, 2014). Habib *et al.* (2014) argue that audit quality is a matter of great regulatory importance and paramount for investors' protection, as managers could expropriate minority shareholders' resources if not monitored properly. In his speech about audit quality, Michel Prada, Chairman of the IFRS Foundation Trustees, claim that audit quality has become a global issue for standard setters, regulators and investors. He argues that investors rely on the financial statements provided by public firms when making investment decisions. However, Prada claims that auditors are vested with the essential responsibility of bestowing relevance and credibility upon such statements. If auditors fail to deliver high-quality audits, investor confidence may plummet, leading to negative consequences for capital markets and local economies (Prada, 2007). Although audit quality is no longer a new concept in the auditing literature, there still does not exist a universal definition that researchers can agree upon

unanimously (Bing *et al.*, 2014). DeAngelo (1981) provides the most widely used definition of audit quality. According to DeAngelo (1981, p. 186), audit quality is defined as "the market-assessed joint probability that a given auditor will both (a) discover a breach in the client's accounting system and (b) report the breach". The first feature of this definition depends on the auditor's technological capabilities, the audit procedures and techniques employed. The second feature depends on the auditor's independence from a given client.

Measuring audit quality has also been a controversial issue in academics for quite some time (Bing *et al.*, 2014). In their review of archival audit research, DeFond and Zhang (2014) note that audit quality is generally difficult to measure due to the amount of assurance auditors provide being unobservable. However, the literature has used auditor size as a proxy for audit quality because large auditors are expected to have stronger incentives and greater competencies to provide high audit quality. Using Big 4 firms as an indicator of audit quality has been one of the most thoroughly researched areas in the literature, and it provides comprehensive evidence that Big 4 auditors tend to deliver higher audit quality (DeFond and Zhang, 2014). DeAngelo (1981) claims that larger audit firms have a greater incentive to maintain independence from their clients and to report breaches, as they will lose if they act opportunistically and deliver a lower quality of audit than expected. In contrast, smaller local audit firms tend to be sensitive to their clients' demands because of the economic consequences of losing a client; thus, apparent bonding with clients would tend to deter smaller audit firms from demanding greater detailed disclosures in clients' corporate annual reports.

DeFond and Zhang (2014) argue that audit quality is an essential component of financial reporting quality, as high audit quality increases the credibility of financial reports. This increased credibility arises through greater assurance that financial statements faithfully reflect a firm's underlying economics. These assurances reduce information risk, which ultimately improves the efficiency of resources allocation. Bartov *et al.* (2000) suggest that higher quality auditors are less willing to accept questionable accounting practices and more likely to report errors and irregularities. Similarly, Schauer (2002) notes that a higher quality audit increases the probability that the financial statements more accurately reflect the financial position and results of operations of the entity being audited. Habib *et al.* (2014) suggest that high-quality auditors constrain opportunistic earnings management and increase the informativeness of earnings and its components. Wallace *et al.* (1994) argue that firms audited by internationally affiliated audit firms (Big 4) are more likely to provide more detailed information than firms audited by local audit firms. The rationale is that internationally affiliated audit firms tend to be larger and offer more expertise than local audit firms.

The effectiveness of the auditing function depends on auditors' ability to constrain managers' opportunistic behavior; however, the extant audit literature recognizes that all audits may not be of equal quality due to differences in the technical abilities of auditors and in the actual independence of auditors (Woodland and Reynolds, 2003). It is argued that higher quality auditors (Big 4) provide high-quality services to their firms, resulting in high-quality accounting information being provided to market participants. Taken together, the evidence presented on audit quality literature strongly indicates that Big 4 audit firms provide more effective audits than non-Big 4 audit firms by increasing the assurance that the financial statements faithfully reflect a firm's

underlying economics. Higher audit quality may enhance the value relevance of earnings and book value and hence improve the usefulness of accounting information in the investment decision-making process.

In Kuwait, corporate law requires each company to appoint at least two external auditors from separate audit firms. The combination of audit firms that companies may use varies based on the unique combination of auditors the company appoints. Therefore, audit quality may also vary from company to company, and, consequently, variations are expected to exist related to the influence of audit quality on financial reporting quality across KSE-listed companies. Thus, it is expected that the value relevance of earnings and book value among KSE-listed firms would probably vary between those companies audited by Big 4 auditors and non-Big 4 auditors. Firms audited by the international Big 4 audit firms would be expected to be associated with a higher value relevance than those audited by the non-Big 4. In Kuwait, where regulations require that each listed company be audited by two external auditors (Big 4, non-Big 4 or a combination of both), it is expected that the value relevance of accounting measures would increase with more frequent use of Big 4 audit firms. Accordingly, the following hypothesis is tested:

H1. The value relevance of earnings and book value, jointly, is positively associated with the number of Big 4 audit firms that audit a company's financial statements.

To test the incremental effect of audit quality on the value relevance of earnings and book value, individually, the following two hypotheses are tested:

H2. The value relevance of earnings, individually, is positively associated with the number of Big 4 audit firms that audit a company's financial statements.

H3. The value relevance of book value, individually, is positively associated with the number of Big 4 audit firms that audit a company's financial statements.

4. Data and research design
4.1 Period, sample and data description
This study covers a 12-year period from 2002 to 2013. The data needed to investigate the value relevance of accounting information include stock prices, book values of equities, net income and common shares outstanding. The main source of stock price data is the database in the KSE's Public Relations Department. The main source of other data is company financial statements, which were hand-collected from the KSE's Auto Documentation and Archival Department. The KSE's 2013 investor guide shows that by the end of 2013, the KSE-listed 195 Kuwaiti companies. Due to the relatively small number of companies listed on the KSE, this study uses all of the KSE-listed companies.

The initial sample consists of 1,938 company-year observations over a 12-year period (2002-2013). However, missing data resulted in the exclusion of 64 company-year observations. To control for the effects of extreme values, 38 observations that are in the top and bottom 1 per cent of the distribution of the Ohlson's (1995) model variables were removed. The final sample consists of 1,836 company-year observations for the 12-year period, ranging from 84 in 2002 to 182 in 2013. Table I shows the number of companies listed on the KSE between 2002 and 2013.

Industry year	Financial (banks and insurance)	Investment	Real estate	Industrial (industry and food)	Service	Total
2002	12 (14.3%)	22 (26.2%)	13 (15.5%)	21 (25%)	16 (19%)	84 (100%)
2003	12 (12.5%)	28 (29.2%)	15 (15.6%)	24 (25%)	17 (17.7%)	96 (100%)
2004	15 (13.3%)	30 (26.5%)	19 (16.8%)	27 (23.9%)	22 (19.5%)	113 (100%)
2005	15 (10.6%)	39 (27.5%)	28 (19.7%)	28 (19.7%)	32 (22.5%)	142 (100%)
2006	16 (9.8%)	43 (26.4%)	29 (17.8%)	30 (18.4%)	45 (27.6%)	163 (100%)
2007	16 (9.8%)	36 (22%)	35 (21.3%)	31 (18.9%)	46 (28%)	164 (100%)
2008	16 (10%)	39 (24.4%)	28 (17.5%)	31 (19.4%)	46 (28.8%)	160 (100%)
2009	16 (8.7%)	42 (22.8%)	36 (19.6%)	34 (18.5%)	56 (30.4%)	184 (100%)
2010	16 (8.7%)	41 (22.3%)	38 (20.7%)	35 (19%)	54 (29.3%)	184 (100%)
2011	16 (8.7%)	41 (22.3%)	38 (20.7%)	33 (17.9%)	56 (30.4%)	184 (100%)
2012	16 (8.9%)	39 (21.7%)	36 (20%)	33 (18.3%)	56 (31%)	180 (100%)
2013	17 (9.3%)	40 (22%)	36 (19.8%)	33 (18.1%)	56 (30.8%)	182 (100%)
Total	183 (10%)	440 (24%)	351 (19%)	360 (20%)	502 (27%)	1836 (100%)

Table I.
Number of
observations ranked
by years and
industry

4.2 Valuation models

Different valuation models have been used by prior research to assess the value relevance of accounting information, but two valuation models dominate the literature. They are the price model and the returns model. The price model examines the association between stock price and earnings and book value (Ohlson, 1995), while the returns model examines the association between stock returns and the levels and changes in accounting earnings (Easton and Harris, 1991). Kothari and Zimmerman (1995) compare the price and returns models and show that the price models produce better specified earnings-response coefficients. Ohlson's 1995 model expresses a firm's market value as a linear function of earnings, book values and other value relevant information. The model has many appealing properties and provides a useful benchmark for conceptualizing how market value relates to accounting data and other information (Ohlson, 1995). Consistent with the recommendations of Barth *et al.* (1992) and Kothari and Zimmerman (1995), I use the per-share value of price, earnings and book values to reduce heteroscedastic disturbances and scaling effects. To ensure the accuracy of per-share information, all data were checked to confirm the treatment of any capital adjustment.

Following Collins *et al.* (1997), Barth *et al.* (1998), Collins *et al.* (1999), Francis and Schipper, (1999), Lev and Zarowin (1999), Gjerde *et al.* (2005), Hellstrom (2006), Habib and Azim (2008), Lee and Lee (2013), Tsalavoutas and Dionysiou (2014) and many others, Ohlson's (1995) model is used as a framework to explore the relationship between company value, earnings and book value as follows:

$$P_{it} = \alpha_0 + \alpha_1 EPS_{it} + \varepsilon_{it} \tag{1}$$

$$P_{it} = \chi_0 + \chi_1 BVS_{it} + \varepsilon_{it} \tag{2}$$

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVS_{it} + \varepsilon_{it} \tag{3}$$

where P_{it} *is the* stock price per share for firm i at time t, three months after the fiscal year's end. EPS_{it} is the earnings per share of firm i at time t. BVS_{it} is the book value per

share of firm i at time t. In comparing the association between stock prices and accounting measures, relative association studies of value relevance use the coefficient of determination (R^2) as the primary metric to measure value-relevance (Holthausen and Watts, 2001). If accounting variables (e.g. earnings and book value) are value relevant to investors, then an association will exist between stock price and earnings and book value, and the coefficients of earnings and book value will be statistically significant. The coefficient of determination (R^2) of the regression model measures this association. The higher the (R^2) of the regression model, the higher the value relevance of accounting measures.

To investigate the role of audit quality in firm valuation, four approaches are used. First, consistent with Francis and Schipper (1999), Brown et al. (1999) Holthausen and Watts (2001) in using the coefficient of determination (R^2) of the regression model in equation (3) as a proxy for the value relevance of accounting measures and following Lee and Lee (2013) in investigating the effects of audit quality on the value relevance of financial reporting, the sample was partitioned into three subsamples based on whether the financial statements were audited by two non-Big 4 audit firms, one Big 4 and one non-Big 4 audit firms or two Big 4 audit firms. The R^2 of each subsample regression is then compared to determine the incremental explanatory power of earnings and book value.

Second, consistent with previous research (Collins et al., 1997; Francis and Schipper, 1999; Lev and Zarowin, 1999; Lee and Lee, 2013), the differences in the R^2 values of the three subsamples are analyzed by regressing the R^2 values on a dummy variable that represent audit quality. The audit quality dummy variable captures the influence of audit quality on the value relevance of accounting measures. It is equal to 2 if two Big 4 audit firms audit the company's financial statements, 1 if one Big 4 audit firm audits the company's financial statement and 0 if otherwise; my test model is:

$$R_t^2 = \delta_0 + \delta_1 QUALITY_t + \varepsilon_{it} \tag{4}$$

where R_t^2 is the adjusted R^2 values obtained from three subsamples, and Audit is equal to 1-3, corresponding to the three possible auditor combinations of two non-Big 4, one Big 4 and non-Big 4 and two Big 4 audit firms. Audit quality is assumed to have influenced the value relevance of accounting information if the estimated audit quality coefficient ($\beta 1\ QUALITY_t$) is significantly positive. Third, similar to Lee and Lee (2013), a one-way analysis of variance (ANOVA) test is used to investigate the effects of audit quality on the value relevance of accounting information. The test examines whether the R^2 values obtained from the three subsamples are significantly different. Observing statistically higher R^2 values with the two Big 4 audit firms subsample and lower R^2 values with two non-Big 4 audit firms subsample may suggest that the higher the number of Big 4 audit firms in a company's audit team, the higher the value relevance of accounting measures.

Fourth, consistent with Ohlson's "information dynamics" theory, other information available to market participants but not yet captured by accounting measures can be included in the price model. Following Habib and Azim (2008), Chalmers et al. (2010), Brugni et al. (2012), Tsalavoutas and Dionysiou (2014) and many others, a dummy variable that represents audit quality is included in Ohlson's (1995) model to capture the influence of audit quality on the value relevance of accounting measures. The dummy

variable (*AUDIT*) is equal to 2 if two Big 4 audit firms audit the company's financial statements, 1 if one Big 4 audit firm audits the company's financial statement and 0 if otherwise. A significant positive *AUDIT* coefficient indicates that investors consider higher audit quality to be value relevant. Furthermore, industry category is included as a control variable. The following equation incorporates audit quality into Ohlson's (1995) model:

$$P_{it} = \phi_0 + \phi_1 EPS_{it} + \phi_2 BVS_{it} + \phi_3 AUDIT_{it} \\ + \phi_3 IND\_FT_{it} + \phi_3 IND\_INVST_{it} \\ + \phi_3 IND\_INDUS_{it} + \phi_3 IND\_SERV_{it} + \varepsilon_{it}$$

(5)

However, equation (5) does not test the interaction effect of audit quality with earnings and book values that would establish the valuation implication of earnings and book value information conditional on audit quality factors. Therefore, to capture the incremental effect of the value relevance of earnings and book value, interactive variables (*EPS*AUDIT* and *BVS*AUDIT*) are included in Ohlson's (1995) model as follows:

$$P_{it} = \omega_0 + \omega_1 EPS_{it} + \omega_2 BVS_{it} + \omega_3 AUDIT_{it} + \omega_4 EPS*AUDIT_{it} \\ + \omega_5 BVS*AUDIT_{it} + \omega_3 IND\_FT_{it} + \omega_3 IND\_INVST_{it} \\ + \omega_3 IND\_INDUS_{it} + \omega_3 IND\_SERV_{it} + \varepsilon_{it}$$

(6)

Observing statistically significant positive interactive coefficients ($\omega_4 EPS*AUDIT$) and/or ($\omega_5 BVS*AUDIT$) indicate that the higher the number of Big 4 audit firms in a company's audit team, the higher the value relevance of earning and/or book value of equity.

5. Results

5.1 Descriptive statistics

Table II provides descriptive statistics based on the pooled cross-sectional, time-series sample for the dependent and independent continuous variables used in Ohlson's (1995) model. The table shows that the mean (median) stock price per share for the 12-year period to be about KD 0.430 (KD 0.27), ranging from KD 0.01 to KD 3.92. The table indicates that the mean (median) earnings per share during the study period was KD 0.03 (KD 0.02), ranging from KD −0.21 to KD 0.98. The mean (median) book value per

Variable	Mean	Median	SD	Minimum	Maximum
Price (P)	0.429	0.273	0.502	0.010	3.920
Earnings per share (EPS)	0.033	0.020	0.063	−0.210	0.980
Book value per share (BVS)	0.236	0.194	0.188	−0.140	1.760

Table II.
Descriptive statistics for dependent and independent continuous variables

Notes: All numbers are in Kuwaiti dinar (KD); P_{it} is the stock price per share for firm i at time t; EPS_{it} is the earnings per share of firm i at time t; BVS_{it} is the book value per share of firm i at time t, and $t = 2002, \ldots, 2013$, corresponding to the years 2000-2013

share over the 12-year period was KD 0.24 (KD 0.19), ranging from KD −0.14 to KD
1.760. Table II shows that the distribution of the stock price variable was positively
skewed as the means tended to be higher than the medians. Due to the variation from
normality, the stock price variable was transformed using a natural log transformation.
The transformation process dramatically reduced the skewness from 3.02 to 0.15 and
kurtosis from 12.13 to 0.20.

Table III presents the distribution of companies that were audited by either two Big
4 audit firms, one Big 4 audit firm or a non-Big 4 audit firm during the 2002-2013 period.
Panel A of Table III reveals that approximately 55 per cent of KSE-listed companies had
at least one Big 4 audit firm in their audit team combination, while 37 per cent of the
companies were audited by non-Big 4 audit firms and 8 per cent were audited by two Big
4 audit firms. Panel B of Table III presents the detailed, year-by-year breakdown of the
distribution of companies that were audited by either two Big 4 audit firms, one Big 4
audit firm or a non-Big 4 audit firm during the 2002-2013 period.

Table IV presents Pearson's correlation and Spearman's rank correlation among the
variables. As expected, the variables that are hypothesized to predict stock price are
positively and significantly correlated with stock price and each other. Examining the
correlation matrix reveals no pair-wise correlation coefficient in excess of 0.8. This
suggests that multicollinearity is not likely to be a serious problem (Gujarati, 2003).
Variance inflation factors (VIFs) were used to detect the existence of a multi-collinearity
problem among independent variables. The VIFs ranged from 1.04 to 1.76 for the
variables and the mean VIF is 1.51; thus, the VIF result verified the absence of
multi-collinearity. To reduce the presence of heteroscedasticity, Kothari and
Zimmerman (1995) recommend the use of White's (1980) heteroscedasticity-consistent

Combination	Frequency	(%)
Panel A: Auditor Combination 2002-2013		
Two Non-Big 4	687	37
One Big 4 and One Non-Big 4	1,009	55
Two Big 4	140	8
Total	1,836	100
Panel B: Year-by-year breakdown of observations based on Auditor Quality		
Year	Two non-big 4	One big 4 and one non-big 4	Two big 4	Total
2002	17 (20.2%)	53 (63.1%)	14 (16.7%)	84 (100%)
2003	20 (20.8%)	64 (66.7%)	12 (12.5%)	96 (100%)
2004	27 (23.9%)	74 (65.5%)	12 (10.6%)	113 (100%)
2005	50 (35.2%)	83 (58.5%)	9 (6.3%)	142 (100%)
2006	58 (35.6%)	93 (57%)	12 (7.4%)	163 (100%)
2007	65 (39.6%)	88 (53.7%)	11 (6.7%)	164 (100%)
2008	62 (38.8%)	86 (53.7%)	12 (7.5%)	160 (100%)
2009	80 (43.5%)	91 (49.5%)	13 (7%)	184 (100%)
2010	82 (44.6%)	91 (49.4%)	11 (6%)	184 (100%)
2011	79 (42.9%)	94 (51.1%)	11 (6%)	184 (100%)
2012	73 (40.6%)	96 (53.3%)	11 (6.1%)	180 (100%)
2013	74 (40.7%)	96 (52.7%)	12 (6.6%)	182 (100%)
Total	687 (37%)	1,009 (55%)	140 (8%)	1,836 (100%)

Table III.
Type of auditor used
by KSE-Listed firms
2002-2013

standard errors. Because this study also involves panel data, observations are not expected to be independent across years. To correct this problem, the Newey–West heteroscedasticity and autocorrelation consistent errors corrector was used, which followed the recommendations of Hill *et al.* (2008) and was consistent with Kothari and Zimmerman (1995).

5.2 Empirical results

Table V presents the pooled and yearly cross-sectional results of regressing price on both earnings and book value *individually* (Models 1 and 2) and *jointly* (model 3). The adjusted R^2 of the yearly cross-sectional regressions of price on earnings and book value *jointly* (Model 3) ranged from approximately 50 per cent in 2008 to approximately 76 per cent in 2003, with all coefficient estimates for earnings and book value positive and significant in each year ($p < 0.01$). Similar results were obtained when stock prices were regressed on earnings and book value, *individually* (Models 1 and 2). Furthermore, Table V shows the results of the pooled cross-sectional, time-series regression of model in equation (3), which indicate that the model was statistically significant ($F = 1,127.92$, $p < 0.01$). The adjusted R^2 for the pooled cross-sectional, time-series regression of model in equation (3) shows that earnings and book value jointly explained approximately 60 per cent of the variations in KSE firms' stock prices between 2002 and 2013. The findings for the price regression provide convincing evidence that the earnings and book values that KSE-listed firms reported between 2002 and 2013 played an important role in equity valuation in the KSE.

Consistent with the approach of Francis and Schipper (1999), Brown *et al.* (1999) Holthausen and Watts (2001), Lee and Lee (2013) and many others in using the coefficient of determination (R^2) of the regression model in equation (3) as a measure of the value relevance of earnings and book value, the sample was partitioned into three subsamples based on whether the financial statements were audited by two non-Big 4 audit firms, one Big 4 and one non-Big 4 audit firms or two Big 4 audit firms. Table VI presents pooled and yearly cross-sectional results of the regressing price on both earnings and book value jointly (Model 3).

For the two non-Big 4 subsample, the results of the pooled and yearly cross-sectional regressions indicate that the models were statistically significant in all years as shown in the highly significant F value ($p < 0.01$). The adjusted R^2 for the pooled regression shows that earnings and book value jointly explained 58 per cent of the variations in KSE firms' stock prices between 2002 and 2013 for companies audited by two non-Big 4 audit firms. In addition, the results of the pooled data indicate that the coefficient

Variable	p	EPS	BVS	AUDIT
Price (P)	*1.00*	0.787***	0.744***	0.275***
Earnings per share (EPS)	0.689***	*1.00*	0.694***	0.220***
Book value per share (BVS)	0.733***	0.651**	*1.00*	0.213***
Auditor combination (AUDIT)	0.248***	0.151***	0.195***	*1.00*

Table IV.
Bivariate correlations among variables

Notes: **, *** correlation is significant at ≤0.05 and 0.01 levels, respectively (two-tailed); above the diagonal presents Spearman's correlation and below the diagonal presents Pearson's correlations of the variables

Year	n	Model (1) $P_{it} = \alpha_0 + \alpha_1 EPS_{it} + \varepsilon_{it}$ Earnings coefficient	Adj. R^2	Model (2) $P_{it} = \chi_0 + \chi_1 + BVS_{it} + \varepsilon_{it}$ Book value coefficient	Adj. R^2	Model (3) $P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVS_{it} + \varepsilon_{it}$ Earnings coefficient	Book value coefficient	Adj. R^2	F Stat.
2002	84	8.50***	0.694	2.59***	0.592	6.172***	0.96***	0.723	105.93***
2003	96	8.85***	0.676	2.57***	0.551	6.33***	1.27***	0.755	143.29***
2004	113	11.219***	0.642	2.86***	0.527	11.14***	1.01***	0.681	117.19***
2005	142	3.63***	0.529	1.67***	0.580	1.79***	1.01***	0.667	109.31***
2006	163	6.00***	0.472	1.72***	0.559	3.13***	1.20***	0.636	139.86***
2007	164	4.42***	0.246	2.12***	0.621	1.59***	2.02***	0.621	133.41***
2008	160	1.36***	0.112	1.53***	0.480	0.64***	1.41***	0.495	76.82***
2009	184	1.95***	0.230	1.29***	0.572	1.129***	1.08***	0.589	128.82***
2010	184	5.65***	0.551	1.70***	0.689	2.33***	1.25***	0.736	250.27***
2011	184	6.25***	0.564	1.10***	0.349	5.06***	0.58***	0.642	161.95***
2012	180	6.37***	0.450	1.33***	0.628	3.02***	1.020***	0.695	201.88***
2013	182	5.10***	0.316	1.36***	0.640	1.33***	1.218***	0.654	169.30***
Pooled	1836	5.69***	0.473	1.865***	0.519	3.14***	1.23***	0.602	1128***

Notes: *** significant at the 0.01 level; heteroscedasticity and autocorrelation in the yearly OLS was corrected by using White's (1980) heteroscedastic-consistent standard errors; heteroscedasticity and autocorrelation in the pooled OLS was corrected using Newey and West (1987) heteroscedasticity and autocorrelation consistent standard errors; P_{it} is the stock price per share for firm i at time t; EPS_{it} is the earnings per share of firm i at time t; BVS_{it} is the book value per share of firm i at time t, and $t = 2002, ..., 2013$, corresponding to the years 2002-2013

Table V.
Results of
regressions of prices
on earnings and book
values of equity

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Table VI.
Results of
regressions of prices
on earnings and book
values of in
subsamples
partitioned by audit
quality

		Two Non-Big 4 subsample $P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVS_{it} + \varepsilon_{it}$				One Big 4 and One Non-Big 4 subsample $P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVS_{it} + \varepsilon_{it}$				Two Big 4 subsample $P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVS_{it} + \varepsilon_{it}$			
Year	n	EPS	BVS	R^2	F Statistics	EPS	BVS	R^2	F Statistics	EPS	BVS	R^2	F Statistics
2002	84	0.33**	1.26***	0.440	***	7.18***	0.65***	0.790	***	19.52***	2.13***	0.865	***
2003	96	6.71***	0.36*	0.670	***	8.20***	0.79***	0.761	***	7.41***	1.42***	0.975	***
2004	113	7.22***	1.62***	0.673	***	9.10***	0.61*	0.661	***	7.90**	2.06*	0.835	***
2005	142	3.36***	0.18*	0.608	***	1.83***	1.02***	0.703	***	17.41***	0.22*	0.966	***
2006	163	0.93**	1.27***	0.488	***	4.23***	0.97***	0.727	***	2.45***	5.28***	0.901	***
2007	164	1.03**	1.53***	0.774	***	0.39*	2.37***	0.607	***	14.45***	0.11*	0.873	***
2008	160	1.44***	1.05***	0.436	***	0.82***	1.27***	0.553	***	3.89***	3.16***	0.890	***
2009	184	1.28***	1.41***	0.608	***	0.38*	0.84***	0.533	***	1.53*	1.27***	0.839	***
2010	184	2.81***	1.14***	0.656	***	2.03***	1.13***	0.749	***	2.15**	2.23***	0.885	***
2011	184	5.21***	0.21***	0.468	***	4.19***	0.57***	0.593	***	4.71***	0.95***	0.898	***
2012	180	3.04***	0.69***	0.475	***	2.45***	1.01***	0.701	***	10.84***	0.271*	0.885	***
2013	182	1.34***	1.30***	0.517	***	1.10**	1.33***	0.644	***	11.47***	0.17*	0.914	***
Pooled	1836	2.54***	1.18***	0.577	***	2.86***	1.18***	0.601	***	9.90***	0.40***	0.814	***

Notes: *, **, *** significant at the 0.1, 0.05 and 0.01 levels, respectively; heteroscedasticity in the yearly OLS was corrected by using White's (1980) heteroscedastic-consistent standard errors; heteroscedasticity and autocorrelation in the pooled OLS was corrected using Newey and West (1987) heteroscedasticity and autocorrelation consistent standard errors; P_{it} is the stock price per share for firm i at time t; EPS_{it} is the earnings per share of firm i at time t; BVS_{it} is the book value per share of firm i at time t, and $t = 2002, \ldots, 2013$, corresponding to the years 2002-2013

estimates of both earnings and book value had a positive and significant impact on stock prices, indicating that earnings and book value were significant factors for KSE firms' stock valuation for the two non-Big 4 subsample. Furthermore, the year-by-year regression results consistently support the pooled results. The adjusted R^2 of the yearly cross-sectional regressions of price on earnings and book value for the two non-Big 4 subsample ranged from approximately 44 per cent in 2008 to 77 per cent in 2007, with a mean of 57 per cent. Similarly, the coefficient estimates for earnings and book value were positive and significant in each year.

For the one Big 4 & one non-Big 4 subsample, Table VI shows that the pooled and yearly models were all statistically significant as shown in the highly significant F value ($p < 0.01$), suggesting that that the earnings and book value in combination are highly significant in explaining stock price variations in this subsample. The pooled adjusted R^2 indicates that earnings and book value explain 60 per cent of the variations in stock prices during the 2002-2013 period. Similar to the pooled findings, the adjusted R^2 of the yearly cross-sectional regressions of price on earnings and book value for the one Big 4 and one non-Big 4 subsample ranged from approximately 53 per cent in 2008 to 79 per cent in 2002, with a mean of 67 per cent. All coefficient estimates for earnings and book value were positive and significant in each year.

Consistent with other subsamples, the pooled and yearly models of the two Big 4 subsample are all statistically significant as shown in the F value ($p < 0.01$). The adjusted R^2 for the pooled regression shows that earnings and book value jointly explained 81 per cent of the variations in stock prices between 2002 and 2013 for companies audited by two Big 4 audit firms. The adjusted R^2 of the yearly cross-sectional regressions ranged from approximately 84 per cent in 2004 to 98 per cent in 2003, with a mean of 89 per cent. The coefficient estimates for earnings and book value were positive and significant in each year.

To explore the extent to which value relevance differs across the three subsamples, the adjusted R^2 values of the pooled and yearly cross-sectional regressions of the three samples are compared to each other. The subsample with the greater adjusted R^2 is described as being more value relevant (Holthausen and Watts, 2001). The comparison of the pooled and yearly adjusted R^2 values presented in Table VI reveals that, in all years, the adjusted R^2 values of the Two Big 4 subsample are greater than the adjusted R^2 values of the Two Non-Big 4 subsample and the One Big 4 and One Non-Big 4 subsamples. Further comparison shows that the adjusted R^2 values of the One Big 4 and One Non-Big 4 subsamples are greater than the adjusted R^2 values of the Two Non-Big 4 subsample, except in years 2004, 2007 and 2009. These findings may suggest that the higher the number of Big 4 audit firms in a company's audit team, the greater the value relevance of both earnings and book value, thus supporting the theoretical expectation of the association between audit quality and the value relevance of accounting information to market participants. These results provide preliminary support for *H1*.

To further investigate the role of audit quality in firm valuation, the adjusted R^2s obtained from yearly cross-sectional regressions of the three subsamples were regressed on a dummy variable that represent audit quality (*QUALITY*). Table VII presents these results and indicates that the QUALITY coefficient was positive and statistically significant ($p < 0.01$), implying a significant positive impact of audit quality on the value relevance of earnings and book value, *jointly*. This finding provides support for the earlier results that the higher the number of Big 4 audit firms in a company's audit team,

	Model:	$R^2 = \delta_0 + \delta_1 + QUALITY_t + \varepsilon_{it}$		(4)
Variable	Coefficients		*t*-statistic	
Constant	0.547		23.520***	
AUDIT	0.163		9.051***	
n	R^2	Adj. R^2	*F*-statistic	*p*-value (*F*-statistics)
36	0.707	0.698	81.919	0.000

Table VII.
Regression of the yearly R^2 values on an audit quality variable

Notes: ***Significant at the 0.01 level; R_t^2 is the adjusted R^2s obtained from yearly cross-sectional regressions of the three subsamples; namely, Two Non-Big 4, One Big 4 and One Non-Big 4 and Two Big 4 subsamples; *QUALITY* is a dummy variable that represents audit quality. It is equal to 2 if two Big 4 audit firms audit the company's financial statements, 1 if one Big 4 audit firm audits the company's financial statement and 0 if otherwise

the greater the value relevance of both earnings and book value; it provides further evidence to support *H1*.

A one-way ANOVA test was used to investigate differences in the adjusted R^2s obtained from yearly cross-sectional regressions of the three subsamples. Untabulated results reveal significant differences ($F = 47.25$, $p < 0.01$) in the value relevance of earnings and book value, as measured by the adjusted R^2s, across the three possible auditor combinations. Post-hoc comparisons with Tukey's honestly significant different test presented in Table VIII show that the adjusted R^2s mean for companies audited by two Big 4 audit firms ($M = 89$ per cent, SD $= 0.04$) is significantly different ($p < 0.05$) from the adjusted R^2s means of (a) companies audited by one Big 4 and one non-Big 4 firm and (b) companies audited by two non-Big 4 audit firms. Similar significant differences occur between companies audited by one Big 4 and one non-Big 4 firm and between firms audited by two non-Big 4 audit firms. These findings provide further support of the earlier results that the higher the number of Big 4 audit firms in a company's audit team, the greater the value relevance of both earnings and book value; they provide further evidence to support *H1*.

Consistent with Ohlson's "information dynamics" theory, other information available to market participants but not yet captured by accounting measures can be

(I) Auditor combination	(J) Auditor combination	(I−J) Mean difference	Std. error	Significance	95% confidence interval Lower bound	Upper bound
Two Non-Big 4	One Big 4 and One Non-Big 4	−0.101*	0.034	0.016	−0.185	−0.016
	Two Big 4	−0.326*	0.034	0.000	−0.410	−0.241
One Big 4 and One Non-Big 4	Two Non-Big 4	0.101*	0.034	0.016	0.016	0.185
	Two Big 4	−0.225*	0.034	0.000	−0.309	−0.141
Two Big 4	Two Non-Big 4	0.326*	0.034	0.000	0.241	0.410
	One Big 4 and One Non-Big 4	0.225*	0.034	0.000	0.141	0.309

Table VIII.
Auditor combination post-hoc Tukey HSD tests (Multiple comparisons) dependent variable: adjusted R^2s

Note: *The mean difference is significant at the 0.05 level

included in the price model. Following a prior line of research, a dummy variable that represents audit quality is included in Ohlson's (1995) model to capture the influence of audit quality on the value relevance of accounting measures. Furthermore, to capture the incremental effect of the value relevance of earnings and book value, interactive variables (*EPS*AUDIT* and *BVS*AUDIT*) are included in Ohlson's (1995) model. Column 2 of Table IX shows the results of regressing stock price on earnings and book values (Model 3). The results indicate that the model was statistically significant ($F = 425.323$, $p < 0.01$). The adjusted R^2 for the pooled cross-sectional regression of model in equation (3) shows that earnings and book values *jointly* explained approximately 63 per cent of the variations in KSE firms' stock prices during the 2002-2013 period.

Column 3 of Table IX shows the results of regressing stock price on earnings, book values and audit quality (Model 5). The result indicates that the model was statistically significant ($F = 376.199$, $p < 0.01$) and explains approximately 64 per cent of the variations in KSE firms' stock prices during the 12-year period (2002-2013). Consistent with Model 3, coefficients on earnings and book value remain positive and highly significant ($p < 0.01$). The results show that the audit quality variable enters Ohlson's (1995) model regression with positive and statistically significant coefficients ($p < 0.01$), confirming earlier evidence that the higher the number of Big 4 audit firms in a

Variable	Model (3) Coefficient	Model (5) Coefficient	Model (6) Coefficient
Dependent variable: stock price			
Intercept	0.042***	−0.077***	0.044**
EPS	2.909***	2.876***	1.826***
BVS	1.218***	1.186***	1.155***
AUDIT		0.084***	0.041**
*EPS *AUDIT*			1.448***
*BVS *AUDIT*			0.018
IND_FT	0.152***	0.083***	0.077***
IND_INVST	0.041*	0.022	0.020
IND_INDUS	0.086***	0.086***	0.091***
IND_SERV	0.171***	0.159***	
Adj. R^2	0.632	0.640	0.648
F statistics	425.323***	376.199***	302.766***
n	1836	1836	1836

Notes: *, **, ***significant at the 0.1, 0.05 and 0.01 levels, respectively; heteroscedasticity and autocorrelation in the pooled OLS was corrected using Newey and West (1987) heteroscedasticity and autocorrelation consistent standard errors; P_{it} is the stock price per share for firm i at time t, three months after the end of the fiscal year; EPS_{it} is the earnings per share of firm i at time t; BVS_{it} is the book value per share of firm i at time t; *AUDIT* is a dummy variable that represent audit quality. It is equal to 2 if two Big 4 audit firms audit the company's financial statements, 1 if one Big 4 audit firm audits the company's financial statement and 0 if otherwise, $t = 2002, \ldots, 2013$, corresponding to the years 2002-2013; *IND_FT* is a dummy variable that equals 1 for firms in the *Financial Institutions* category, and 0 otherwise; *IND_INVST* is a dummy variable that equals 1 for firms in the *Investment* category, and 0 otherwise; *IND_INDUS* is a dummy variable that equals 1 for firms in the *Industrial* category, and 0 otherwise; *IND_SERV* is a dummy variable that equals 1 for firms in the *Service* category, and 0 otherwise (the omitted industry category when all categories are zero is the *Real Estate* category)

Table IX.
Results of regression
of price on earnings,
book value and audit
quality

company's audit team, the greater the value relevance of both earnings and book value. These results provide additional support for *H1*.

Column 4 of Table IX presents the interaction effect of audit quality with earnings and book values, *jointly* (Model 6). The results indicate that the model was statistically significant ($F = 302.766$, $p < 0.01$) and explains approximately 65 per cent of the variations in KSE firms' stock prices during the 2002-2013 period. Consistent with Models 3 and 5, coefficients on earnings, book value and audit quality remain positive and highly significant ($p < 0.01$). The interaction of earnings and book value with audit quality (*EPS*AUDIT* and *BVS*AUDIT*) was examined to capture the incremental effect of audit quality on the value relevance of earnings and book value. If audit quality improves the value relevance of earnings and book value to market participants, then these interactive coefficients should be positive and significant. Consistent with expectations (*H2*), the results presented in Column 4 of Table IX show that the coefficient on *EPS*AUDIT* is positive and significant ($p < 0.01$), suggesting that the incremental value relevance of earnings is higher when more Big 4 audit firms audit the company's financial statements. Furthermore, inconsistent with expectations (*H3*), the results reveal that the coefficient on *BVS*AUDIT* is positive but in contrast to earnings, is insignificant, suggesting that there is no difference in the incremental value relevance of book value based on audit quality factors.

6. Conclusion
Since 1995, firms listed on the KSE have been obligated to be audited by two different external audit firms. This requirement distinguishes the Kuwaiti accounting environment from that of countries with more developed economies where only one external auditor is required. Motivated by the unique institutional setting that exists in Kuwait, the purpose of this study is to examine the effect of audit quality on the value relevance of earnings and book value. Consistent with prior research, value relevance of earnings and book value is measured by the adjusted R^2 derived from Ohlson's 1995 regression model. The number of Big 4 audit firms represented on a firm's audit team is used as a proxy for audit quality. Three tiers of audit quality exist, namely two Non-Big 4 audit firms, one Big 4 and one Non-Big 4 audit firms or two Big 4 audit firms. To address this paper's objective, the association between audit quality and the value relevance of earnings and book value was examined using four approaches. The final sample consists of 1,836 firm-year observations and covers fiscal years 2002-2013.

Collectively, the four approaches used to investigate the role of audit quality in firm valuation provide empirical evidence that audit quality positively and significantly affects the value relevance of accounting measures to market participants. Importantly, the results reveal significant variations in the value relevance of earnings and book value, *jointly*, across the three possible auditor combinations. Firms audited by two Big 4 audit firms are generally associated with more value relevant earnings and book values than either firms audited by one Big 4 firm and one non-Big 4 firm or two non-Big 4 audit firms. The results also show that firms audited by one Big 4 firm and one non-Big 4 firm are generally associated with more value relevant earnings and book values than those audited by two non-Big 4 audit firms. The results of interacting earnings with audit quality suggest that the incremental value relevance of earnings is higher when more Big 4 audit firms audit the company's financial statements. In contrast, no difference in the incremental value relevance of book value is observed across the three possible auditor combinations.

The findings of this paper have several contributions and implications. First, the study adds to the extent literature on audit quality by exploring the role of audit quality in a unique institutional setting that imposes mandatory joint audits. Second, the findings showed the importance of high-quality and rigorous external audits in improving the value relevance of accounting information and highlighted the added value of audit quality to market participants. Third, users of KSE-listed firms' financial statements might reasonably expect that the higher the number of Big 4 audit firms in a company's audit team, the greater the value relevance of both earnings and book value. The findings that audit quality contributes to the enhancement and informativeness of accounting measures are expected to be particularly relevant to standard setters, regulatory agencies and investors who are concerned about the implications of audit quality and transparency of listed companies' financial statements. Although using auditor size as a proxy for audit quality is well established in the auditing literature, a limitation of that proxy is that it measures audit quality dichotomously, which implicitly assumes a homogeneous level of audit quality within each group (DeFond and Zhang, 2014). Future research could investigate the role of audit quality on firm valuation using other proxies of audit quality. This study was based on Ohlson's (1995) valuation model; future research would benefit from exploring this issue further by using other valuation models.

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