

FAIR VALUE ACCOUNTING AND AUDIT FEES: THE MODERATING EFFECT OF THE GLOBAL FINANCIAL CRISIS IN JORDAN

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ABSTRACT

This article introduces new empirical evidence exploring the relationship between the introduction of Fair Value Disclosure (FVD) and audit fees, and the moderating effect of the Global Financial Crisis (GFC) on this relationship. This study is primarily motivated by the limited and inconclusive research on the monitoring costs resulting from FVD. The Ordinary Least Squares (OLS) method using a sample of 222 Jordanian firms during 2005–2018 is applied. The analysis finds that a greater level of FVD is the major cause of high audit fees. Results are more pronounced for firms with larger proportions of subjective FVDs (Level 3 assets). A significant negative (positive) impact of the pre-crisis (post-crisis) period on the association between the proportion of fair-valued assets and audit fees is confirmed. The regression results confirm the negative effect of pre-crisis period on moderating the association between the all-fair value input levels (Levels 1, 2 and 3 assets) and audit fees. The post-crisis period has a significant positive effect only in relation to Level 1 assets. Findings of this study provide policymakers and standards setters with updated evidence originating from a non-Western setting about the post-implementation costs of FVD.

Keywords: fair value accounting, audit fees, global financial crisis, developing countries, Jordan

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INTRODUCTION

Fair Value Accounting (FVA) was introduced in the International Accounting Standards Board (IASB) agenda since 2005 after releasing the amended version of IAS 39 — “fair value option” (IAS Plus, 2005). The rationale of IASB on FVA is to promote such benefits as relevant, transparent and comparable financial information (Barth & Landsman, 2018; IAS Plus, 2019). However, FVA introduces substantial difficulties from the auditing perspective in preparing and confirming fair values, especially later with the further requirements to measure financial instruments through the three input levels: Level 1, Level 2 and Level 3 (Griffith, 2020; Nguyen, 2019). Level 1 inputs reflect active markets’ quoted prices, Level 2 inputs are observable inputs and Level 3 inputs which are usually risky and complex ones reflect unobservable inputs to measure the fair values (IAS Plus, 2020). The increased complex estimates of FVA encourage management bias and put further pressure on the need for high-quality audits (Cannon & Bedard, 2017). Consequently, more audit effort and time are required for auditors to deliver assurance in financial reports which eventually leads to higher audit fees (Abdullatif & Al-Rahahleh, 2020).

Financial disasters and catastrophic global downturns, related to the Global Financial Crisis (GFC) of 2008–2009, encouraged further scrutiny of financial statements and auditing standards (Bookey & Soobaroyen, 2017). The severity of the GFC has led to questions about the role of auditors where an unqualified audit opinion was followed by financial fraud and business collapse (Sikka, 2009). The GFC revealed FVA-related abuses and fraud in firms’ financial performance (de Jager, 2014), price bubbles in finance-related statements (Penman, 2007) and greater market volatility (Allen & Carletti, 2008b; Magnan, 2009). Higher risk for Level 2 and Level 3 fair value inputs (Bratten et al., 2013) resulted in putting more burdens on auditors and rising audit prices (Xu et al., 2013; Alharasis et al., 2020). In Jordan’s case, FVA is aggressively used by companies due to the growing reliance of Jordan’s economy on external exports which has increased the use of financial assets by domestic companies (Abdullatif, 2016). The need for external assurance regarding fair values becomes particularly important in Jordan due to the higher fair value abuse caused by the non-availability of fair value information and weaknesses in corporate governance schemas.

Therefore, this study aims to investigate the potential influence of FVA on audit fees in Jordan. The current study is motivated by growing use of uncertain Fair Value Estimates (FVE), and their potential role in the worldwide credit crisis of 2008–2009 (Haswell & Evans, 2018; Joe et al., 2017).

The current examination is also motivated by the call of the IASB for further analysis to comprehend the influences of post-IFRS 13 – “Fair Value Measurement” on accounting and auditing practices (IFRS, 2018). Subsequently, the current evidence complements this examination in documenting the missing link between FVD and monitoring costs following the introduction of FVD requirements through the International Financial Reporting Standards (IFRS) since 2005. More importantly the recent hierarchy disclosure requirements since 2009 and 2013 as required by IFRS 7– “Financial Instruments: Disclosures” and IFRS 13, respectively (Sangchan et al., 2020).

The current study extends the research that has been done on the relationship between FVD and audit fees (including Ettredge et al., 2014; Goncharov et al., 2014; Yao et al., 2015; Alexeyeva & Mejia-Likosova, 2016; Sangchan et al., 2020). Unlike prior research, this study proposes an updated model to accurately reflect a developing country (Jordan) situation and incorporates the effect of the presence of FVD on audit fees. In particular, we focus on the proportion of fair-valued assets using input levels (i.e., Level 1, Level 2 and Level 3). We also support the proposed model by providing empirical results using an extended sample that includes 14 years (2005–2018), as suggested by Abdullatif (2016). This empirical effort on the post-implementation of FVA is still in its infancy (Sangchan et al., 2020), including evidence for the Middle Eastern (ME) region and Jordan in particular (Abdullatif, 2016). Since existing research comes from larger and more developed countries with more mature audit markets, this examination is needed for Jordan especially following the initial adoption of IFRS requirements regarding detailed disclosure of fair-valued assets in the firms’ annual reports. Accordingly, this study is motivated by the widespread adoption of IFRS in emerging economies that have occurred in recent decades (Uzma, 2016; Al-Htaybat, 2018).

More importantly, this study considers factors related to GFC and develops new empirical evidence on the effect of the pre- and post- GFC on the association between the proportion of fair-valued assets and audit fees. Since the GFC erupted in 2008, there is now much more emphasis on detailed clarification about how Fair Value Measurement (FVM) have been acquired (Xu et al., 2013). The current paper extends, for the first time, the scant and inconclusive empirical evidence on the impact of the GFC on audit fees, specifically its far-reaching influence on the link between FVD and audit fees. This study’s objective is to broaden the existing knowledge of the impact of the GFC on audit fees considering FVD factors (Groff et al., 2017; Krishnan & Zhang, 2014). Furthermore, the study combines the agency, signalling, and stakeholder theories to evaluate the FVA consequences on audit pricing. Consequently, it strives to

fill the theoretical gap highlighted by Samaha and Khelif (2016), who confirmed that signalling theory had not been tested in developing countries concerning compliance with IFRS /FVD.

What is happening in Jordan can be generalised to the whole ME. The ME nations have similar history, language, religion, beliefs, cultures, traditions, and geography, etc. (Tahat, Omran, et al., 2018). Jordan enjoys a sense of political stability in a historically turbulent region. These cultural and political factors have led to several improvements in the behaviour of Jordanian corporations and how they communicate their financial information (Al-Htaybat, 2018). With limited information available about the ME accounting environment and Jordan in particular, the study reflects an increasing interest in the area as a channel for foreign investments and economic development (Tahat, Omran, et al., 2018; Tahat, Dunne, et al., 2016). Unlike other Arab-Gulf countries, Jordan was one of the first ME countries to implement IFRS and the International Standards on Auditing (ISA) in the early 1990s following the Companies Law No. 22. (Al-Htaybat, 2018). By 2005, and following the IAS 39, Jordanian corporations were required to measure their financial assets using FVMs, such as those held for sale and for trading. The rising use of financial instruments by companies and the publicity about financial instruments losses reported in the media further encouraged this examination to concentrate on FVA of financial assets in Jordan (Siam & Abdullatif, 2011; Tahat, Dunne, et al., 2016). Interestingly, Jordan is the only Arab country demanding (since 2001) listed firms to disclose the amounts of audit fees in their annual reports as a legal requirement (ALshbiel & Tahat, 2014).

The Ordinary Least Squares (OLS) regression technique helped to test the developed hypotheses using hand-collected data from 222 Jordanian listed firms (3108 firm-year observations) for the years 2005–2018. The analysis concludes that audit fees are positively influenced by the presence of the FVD and the proportion of fair-valued assets. Analysis confirms that audit fees are positively linked with employing highly uncertain and subjective fair-valued assets (Level 3 assets). Application of FVA poses challenges to auditors, such as complex estimates and adjustments during the evaluation of assets. Therefore, auditors spend more time and effort in evaluating the fair values and provide high-quality audits to protect stakeholders' rights. Consequently, the high-quality audits translated in expensive audit fees. Moreover, the results confirm the negative (positive) impact of the GFC on the relationship between fair-valued assets and audit fees. The findings further support the negative impact of the pre-crisis period on the whole FVA hierarchy level inputs (Levels 1, 2 and 3 assets); meanwhile the impact of post-crisis emerged as being significant for only Level 1 assets.

The results of this study have important implications for various policymakers and standards setters by providing updated empirical evidence on the application of the FVA. The major implications attract the interest of both auditors and clients by updating the current audit pricing models which can be used in determining auditing costs. This analysis assists Jordan's government in providing more specific guidelines and legislations that simplify and guarantee best practices of FVA.

THEORETICAL PERSPECTIVE AND HYPOTHESES DEVELOPMENT

Theoretical Perspective

The application of FVA prescribed in IFRS can be investigated through the lens of the agency, stakeholder and signalling theories since the ideologies it embodies operate as principles prevailing in the current organisational environment (i.e., signalling and stakeholder theories). The organisational environment makes this adaptation more problematic given the fair valuation's complex and uncertain estimates, i.e., agency theory (Alharasis et al., 2020). Agency and signalling theories are commonly employed to explain the choice of accounting methods (Khlif & Achek, 2016; Samaha & Khlif, 2016). Unlike agency theory, from the stakeholder theory view, the firm is seen in its wider social fabric and the managers are accountable to a wider range of stakeholders (Huang et al., 2020; Saleh et al., 2013). Therefore, this study employs triangulation for the agency and signalling theories, as well as drawing on stakeholder theory (see Figure 1). Agency theory is consistent with signalling theory in terms of considering information asymmetry and seeks to explain how shareholders are affected (Leventis & Caramanis, 2005).

In addition, agency theory expresses the conflict between shareholders and managers which is also reviewed in stakeholder theory (Guay et al., 1996). Unlike prior literature on FVD and audit fees (Ettredge et al., 2014; Goncharov et al., 2014; Alexeyeva & Mejia-Likosova, 2016; Sangchan et al., 2020), this study introduces signalling theory and stakeholder theory with reference to Jordan to complement agency theory in examining this issue. In the theoretical framework, corporate disclosure is defined using agency theory (Samkin & Schneider, 2010). Signalling and stakeholder theories are used to explain the communication aspect of the FVD and interaction between users. While the overall aim of disclosure is captured by the stakeholder theory, signalling theory suggests a motivation for subjective judgements in FVMs.

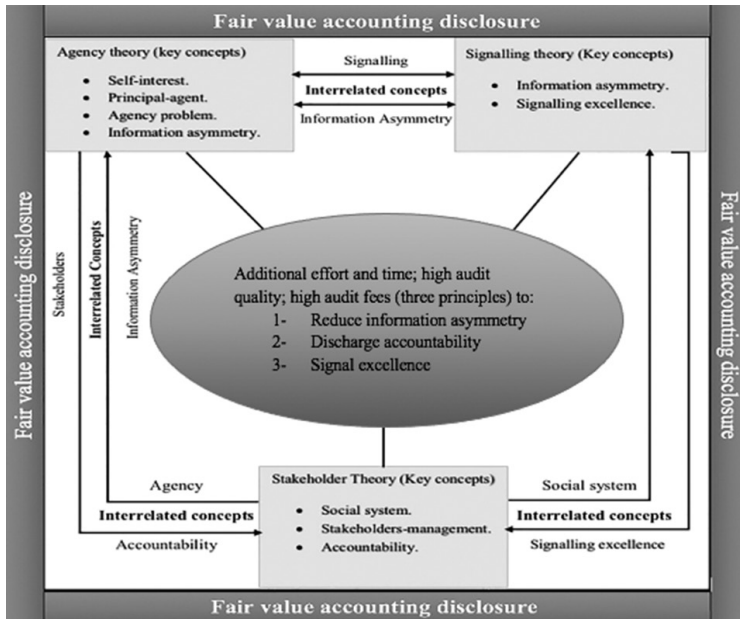


Figure 1. The adapted theoretical framework (Alharasis et al., 2020; An et al., 2011)

Hypotheses Development

Unlike the Historical Cost (HC) approach which uses dated information and dated historical values of assets and liabilities, FVA was introduced by the IASB to provide more relevant information for decision-making. Therefore, HC information lacks comparability and relevance. For this reason, the HC approach was replaced with more relevant accounting methods, such as FVA (McDonough et al., 2020). The fair valuation of financial assets provides the market values of the assets which expresses the true economic position (Penman, 2007). Consequently, FVA does contribute to offering better quality financial information and accounting harmonisation (Bookey et al., 2018; Oyewo et al., 2020). However, the presence of fair values increases the information load which eventually leads to a more complex auditing process (Glover et al., 2019). This is due to the risks of inherent uncertainties caused by management bias (Griffith, 2020; Oyewo, 2020). Auditors instead of dealing with facts about past financial events, they deal with estimates regarding subjective forecasts of expected future events (Abdullatif, 2016). So, auditors act on this greater complexity in auditing fair values by offering more time, effort and using their own valuation specialists, ultimately producing higher audit fees (Bratten et al., 2013). In other words, fair value reporting leads to extensive discretion in preparing management evaluations.

This leads to raising the agency costs, resulting in auditors making more effort to assess reputation risk, litigation risk, and consequently, increase their time spent confirming FVEs (Sangchan et al., 2020). Implementing FVA is even more challenging in the context of developing countries (He et al., 2012; Nguyen, 2019). The presence of fair value financial assets causes serious problems in the Jordanian capital market due to the lack of efficient markets (Abdullatif & Al-Rahahleh, 2020). The recognition of unrealised gains/losses of the fair value of financial assets raised share prices to the highest levels during the economic downturn years. Consequently, the share prices fell dramatically later on (Abdullatif & Al-Khadash, 2010; Abdullatif, 2016). The main cause of this situation was fair value fraud by managers due to the agency problem (Siam & Abdullatif, 2011). The need for independent assurance regarding FVEs has been increased to avoid earnings management practices and ultimately led to higher audit prices (Abu Rishah & Al-Saeed, 2014). Higher audit fees paid by Jordanian firms turned into a signal of high-quality financial information provided to stakeholders (Alhababsah, 2019; Fikri & Yahya, 2019). Based on the theoretical evidence discussed above, the following hypothesis is developed:

H1: There is a positive relationship between the presence of fair-valued assets and audit fees among Jordanian listed firms.

Auditors spend more time and effort in evaluating the fair-valued assets due to the complexity and risk they face while conducting the audits (Sangchan et al., 2020). The greater use of uncertain fair-valued assets leads to higher audit fees (Ettredge et al., 2014). The risk became higher, particularly for Level 2 and Level 3 fair value inputs which resulted in increasing auditors' burden and eventually driving audit prices up (Griffith, 2020). In Jordan, fair value is aggressively used by companies to serve managers' interests due to the agency conflict. Consequently, this abuse increased volatility in share prices traded in the Jordanian capital market (Abdullatif, 2016). The explanation for fraud and abuse is the lack of Jordanian active markets, weak corporate governance systems and the non-availability of clear guidelines on how fair value is to be measured and audited (Abdullatif & Al-Rahahleh, 2020). Jordanian auditors do expect to spend more time and effort in detecting management fraud and misstatement to limit the information asymmetry problem. Consequently, increasing the credibility of a firm's financial reporting quality is considered a positive signal for stakeholders (Alzoubi, 2018). Based on the theoretical evidence discussed above, the following hypotheses are developed:

H2a: There is a positive relationship between the proportion of fair-valued assets and audit fees among Jordanian listed firms.

H2b: The relationship between fair-valued assets and audit fees is stronger for firms with greater ratios of the subjective fair-valued assets (Level 2 and Level 3) among Jordanian listed firms.

A fresh concern about FVMs emerged in the aftermath of the GFC of 2008–2009 due to higher managerial assumptions being utilised to prepare fair values especially in the case of absent active markets (Alexeyeva & Svanström, 2015; Demartini & Trucco, 2017; Huang et al., 2020; Zaman et al., 2017). Two controversial views regarding the alleged role of FVA in the GFC were provided recently (Alharasis et al., 2020). Some commentators felt that fair value implementation was not responsible for the crisis and there is no solid evidence which supports this claim against FVA (Barth & Landsman, 2010; Laux & Leuz, 2010; Plantin & Tirole, 2018; Pozen, 2009). Conversely, due to the agency problem, a group of scholars (Cathey et al., 2012; Plantin et al., 2008; Ryan, 2008) blamed FVA as the main cause of the failure for many financial institutions throughout the world. Accordingly, external auditing has been questioned and stressed especially regarding the use of FVEs to meet users' needs for high-quality financial information (Sikka, 2009). Therefore, the role of FVA in the GFC has been linked to the damage it did to institutions' capital due to the recognition of unrealised profits (Magnan, 2009; Ryan, 2008).

Using a FVA model during the GFC is highly sensitive to managerial assumptions, thus leading to substantially doubtful amounts being reported. Such metrics would require massive effort, time and professional judgements from external auditors to confirm the accuracy of clients' FVMs (Alexeyeva & Svanström, 2015). As a consequence of this business turmoil, the demand for high-quality financial reports increased dramatically, since financial reports are the primary means of communication to bridge the gap between managers and stakeholders (Amel-Zadeh & Meeks, 2015). Additionally, verifying the reliability of fair values is increased for the purpose of improving the confidence of the capital markets and enhancing investors' trust (Rad et al., 2016; Shaw, 2003). Thus, highly qualified supervision of managers' practices and reducing the agency problem translating to higher audit fees are all factors which lead to superior financial disclosure (Gaynor et al., 2016).

The GFC led to greater market volatility in the Jordanian economy and questioned the reliability of FVMs (Siam & Abdullatif, 2011). The risk became higher, particularly for less reliable fair value inputs (Level 2 and Level 3) which resulted in increasing auditors' workload and ultimately drove audit costs up (Abdullatif & Al-Rahahleh, 2020). Several reforms were implemented to overcome the damage (Alexeyeva & Svanström, 2015; Abdullatif, 2016). Jordan's government enacted recovery plans through the Jordan Securities Commission (JSC) and the Central Bank of Jordan (CBJ) to overcome the crisis devastating the country's economy and improve the quality of audits (Abdullatif, 2016). Given the contradictory conclusions reported by empirical literature, the following hypotheses are developed in null form:

- H3a The pre-crisis period does not moderate the relationship between the proportion of fair-valued assets and audit fees among Jordanian listed firms.
- H3b: The post-crisis period does not moderate the relationship between the proportion of fair-valued assets and audit fees among Jordanian listed firms.
- H4a: The pre-crisis period does not moderate the relationship between the proportion of fair-valued assets through hierarchy levels and audit fees among Jordanian listed firms.
- H4b: The post-crisis period does not moderate the relationship between the proportion of fair-valued assets through hierarchy levels and audit fees among Jordanian listed firms.

RESEARCH DATA AND METHODOLOGY

Data Selection

The research data were hand-collected from the annual reports of corporations disclosed on the Amman Stock Exchange (ASE) website. As shown in Table 1, the initial sample comprises all listed companies on ASE, in total of 235 listed companies. We excluded 13 companies with missing data from the total sample. Therefore, the final sample consisted of 222 unique companies for the period 2005 to 2018. It is worth noting that this study investigates this 14-year period mainly because 2005 was the first year in which the fair value for financial assets in Jordan was implemented as required by ISA 39, followed by the amendment of IFRS 7 in 2008 which required corporations to disclose in detail FVMs of

their financial assets. The selected study period represents an alignment with the first and more recent FVD requirements timelines as required by various IASs/IFRSs, such as IAS 39 in (2005), IFRS 7 in (2009), IFRS 9 in (2018) and IFRS 13 in (2013). The data for subsequent years is either not available or disturbed because of the impact wrought by COVID-19.

Table 1
Sample selection procedure

	Total firms	Pooled
Initial sample	235	3290
(-) Firms with missing data	– (13)	– (182)
Total sample	222	3108

Research Design and Variables Measurement

This analysis extends the previous audit pricing models arising from the application of FVA by Ettredge et al. (2014), Goncharov et al. (2014), Yao et al. (2015), Alexeyeva and Mejia-Likosova (2016) and Sangchan et al. (2020) into five basic equations as shown in Table 2 below tested using Stata software.

Interestingly, this analysis introduces new independent variables as proxies for FVD in Jordanian firms’ annual reports, such as the presence of fair value (FVA). The presence of the fair-valued assets variable FVA is incorporated into the study’s model following Goncharov et al. (2014). To test research H1, FVA was used in Equation (1) as an independent dummy variable coded as 1 if the firm’s assets are reported in fair values, 0 otherwise. The proportion of fair-valued assets variable *FVA_TA* was used and presented in Equation (2) to test H2(a). *FVA_TA* is adopted from Ettredge et al. (2014) and was employed later by Alexeyeva and Mejia-Likosova (2016). *FVA_TA* represents the proportion of fair-valued assets measured by the total fair-valued assets deflated by total assets. H2(b) sets out to test the relationship between the proportion of fair-valued assets variable through fair value hierarchy levels (Level 1, Level 2, Level 3) and audit fees. Therefore, H2(b) is tested by separating the proportion of fair-valued assets variable (*FVA_TA*) into: (*FVA1_TA*), (*FVA2_TA*) and (*FVA3_TA*) variables, where *FVA1_TA*, *FVA2_TA*, and *FVA3_TA* are firms’ total fair-valued assets using Level 1, Level 2, and Level 3 fair value inputs deflated by total assets. The hierarchy level inputs variables were also borrowed from Ettredge et al. (2014), Alexeyeva and Mejia-Likosova (2016) and Sangchan et al. (2020), and subsequently incorporated into the study’s model as shown in Equation (3).

The GFC variables *PRECRISIS* and *POSTCRISIS* were used and presented in Equations (4) and (5). Following Alexeyeva and Svanström (2015), the *PRECRISIS* variable refers to the pre-crisis period (2005–2007) while *POSTCRISIS* refers to the post-crisis period (2010–2018). To test H3(a) and H3(b), Equation (2) was modified by adding the two GFC variables (*PRECRISIS*) and (*POSTCRISIS*) and the interaction term of the proportion of fair-valued assets with each GFC variable (*FVA_TA * PRECRISIS*) and (*FVA_TA * POSTCRISIS*) and tested separately as shown in Equation (4). To test H4(a) and H4(b), Equation (3) was modified by adding the two GFC variables (*PRECRISIS*) and (*POSTCRISIS*) and the interaction term of the proportion of fair-valued assets through the hierarchy level inputs with each GFC variable (*FVA1_TA * PRECRISIS*, *FVA2_TA * PRECRISIS*, *FVA3_TA * PRECRISIS*) and (*FVA1_TA * POSTCRISIS*, *FVA2_TA * POSTCRISIS*, *FVA3_TA * POSTCRISIS*) and tested separately as shown in Equation (5).

A number of the traditional control variables have been incorporated into the current study model based on the setting's characteristics and the study's main aim and objectives to ensure the model's suitability (i.e., *LnASSET*, *ROI*, *LOSS*, *LEV*, *GROWTH*, *SUBS*, *Big4*, *CHANGE*, *UNQUALIFIED*).

Table 2
The study's developed equations

Equation no.	Equation
Equation (1)	$LnAFEES = \delta 0 + \delta 1FVA + \delta 2LnASSET + \delta 3SUBS + \delta 4LOSS + \delta 5ROI + \delta 6LEV + \delta 7GROWTH + \delta 8BIG4 + \delta 9CHANGE + \delta 10UNQUALIFIED + IndFE + YearFE + \epsilon.$
Equation (2)	$LnAFEES = \delta 0 + \delta 1FVA_TA + \delta 2LnASSET + \delta 3SUBS + \delta 4LOSS + \delta 5ROI + \delta 6LEV + \delta 7GROWTH + \delta 8BIG4 + \delta 9CHANGE + \delta 10UNQUALIFIED + IndFE + YearFE + \epsilon.$
Equation (3)	$LnAFEES = \delta 0 + \delta 1FVA1_TA + \delta 2FVA2_TA + \delta 3FVA3_TA + \delta 4LnASSET + \delta 5SUBS + \delta 6LOSS + \delta 7ROI + \delta 8LEV + \delta 9GROWTH + \delta 10BIG4 + \delta 11CHANGE + \delta 12UNQUALIFIED + IndFE + YearFE + \epsilon.$
Equation (4)	$LnAFEES = \delta 0 + \delta 1FVA_TA + \delta 2PRECRISIS(orPOSTCRISIS) + \delta 3FVA_TA * PRECRISIS(orPOSTCRISIS) + \delta 4LnASSET + \delta 5SUBS + \delta 6LOSS + \delta 7ROI + \delta 8LEV + \delta 9GROWTH + \delta 10BIG4 + \delta 11CHANGE + \delta 12UNQUALIFIED + IndFE + YearFE + \epsilon.$

(continue on next page)

Table 2 (continued)

Equation no.	Equation
Equation (5)	$LnAFEES = \delta 0 + \delta 1FVA1_TA + \delta 2FVA2_TA + \delta 3FVA3_TA$ $+ \delta 4PRECRISIS(orPOSTCRISIS) + \delta 5FVA1_TA*PRECRISIS(orPOSTCRISIS)$ $+ \delta 6FVA2_TA*PRECRISIS(orPOSTCRISIS) + \delta 7FVA3_TA*PRECRISIS(or$ $POSTCRISIS) + \delta 8LnASSET + \delta 9SUBS + \delta 10LOSS + \delta 11ROI + \delta 12LEV +$ $\delta 13GROWTH + \delta 14BIG4 + \delta 15CHANGE + \delta 16UNQUALIFIED + IndFE +$ $YearFE + \epsilon.$

Notes: *LnAFEES* = the natural log of audit fees; *FVA* = dummy variable coded as 1 if the firm’s assets are reported in fair values, 0 otherwise. *FVA_TA* = firm’s total fair-valued assets deflated by total assets; *FVA1_TA*, *FVA2_TA*, *FVA3_TA* = firm’s total fair-valued assets using Level 1, Level 2 and Level 3 inputs deflated by total assets; *LnASSET* = the natural Log of a firm’s total assets; *SUBS* = the number of a firm’s subsidiaries; *LOSS* = dummy variable coded as 1 for firms with a net income less than 0, 0 otherwise; *ROI* = the net income by total assets; *LEV* = is the total debt divided by the total assets; *GROWTH* = the current year sales to last year sales; *BIG4* = dummy variable coded as 1 if the audit firm is one of the Big 4 audit firms (PwC, KPMG, Deloitte, and E&Y), 0 otherwise; *CHANGE* = auditor tenure of three years, coded 1 if the audit firm did not change, 0 otherwise; *UNQUALIFIED* = dummy variable coded 1 if the firm receives an unqualified opinion, 0 otherwise; *IndFE* = Industry fixed effects; *YearFE* = Year fixed effects; ϵ = Error term.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 3 summarises the descriptive statistics of the research’s variables (pooled for years 2005–2018). The dependent variable is the natural log of audit fees (*LnAFEES*). *LnAFEES* has a mean (median) value of 9.127 (9.048) with a low standard deviation of 1.009. Audit fees ranged from 12.412 to 6.908, suggesting that any variation in audit fees amongst Jordanian listed firms is in fact modest. With respect to the independent variables, the presence of FVD, *FVA* has a mean (median) value of 0.775 (1.00) with a relatively low standard deviation of 0.418. The result shows that almost 78% of Jordanian firms are fair value-oriented. The proportion of total fair-valued assets, *FVA_TA* has a mean (median) value of 0.096 (0.024) whereas the average values ranged from 0.804 to 0.00. The outcomes suggest that the magnitude of fair-valued assets in Jordanian firms is almost 10% of total assets, which is lower than those reported by Ettredge et al. (2014) at 17% in the US and Alexeyeva and Mejia-Likosova (2016) who reported 31% in the EU.

These nations’ capital markets vary substantially from the small and developing countries’ markets like Jordan. Regarding the proportion of total fair-valued assets through the three level hierarchy inputs *FVA1_TA*, *FVA2_TA*, and *FVA3_TA*, the variables have mean (median) values of 0.072 (0.006), 0.008 (0.000), and 0.002 (0.000), respectively. The analysis confirms that

Level 1 assets constitute the overwhelming type of fair-valued assets held by Jordanian businesses with 7% of the total proportion of fair-valued assets, followed by Level 2 and lastly Level 3 which do not constitute more than 1%. Hierarchy average values are close to the values reported in research by Alexeyeva and Mejia-Likosova (2016), Lin et al. (2017) and Huang et al. (2020). The statistics also reveal that 1.2% of Jordanian firms in the current study sample do not fully comply with the fair value hierarchy disclosure requirements, which echoes to some extent Alexeyeva and Mejia-Likosova (2016). The GFC variable, that is, pre-crisis (*PRECRISIS*) has a mean (median) value of 0.214 (0.00). Conversely, post-crisis (*POSTCRISIS*) has a mean (median) value of 0.643 (1).

Table 3
Descriptive statistics

Variable	Mean	Median	S.D.	Min	Max
Experimental Variables (Obs = 3,108)					
<i>LnAFEES</i>	9.127	9.048	1.009	6.908	12.412
<i>FVA</i>	0.775	1.000	0.418	0.000	1.000
<i>FVA_TA</i>	0.096	0.024	0.163	0.000	0.804
<i>FVA1_TA</i>	0.072	0.006	0.136	0.000	0.663
<i>FVA2_TA</i>	0.008	0.000	0.033	0.000	0.220
<i>FVA3_TA</i>	0.002	0.000	0.010	0.000	0.072
<i>PRECRISIS</i>	0.214	0.000	0.410	0.000	1.000
<i>POSTCRISIS</i>	0.643	1.000	0.479	0.000	1.000
Control Variables (Obs = 3,108)					
<i>LnASSET</i>	17.145	16.918	1.724	13.185	22.076
<i>ROI</i>	1329	1319	756.705	29.000	2590
<i>LEV</i>	1378	1358	811.801	32.000	2763
<i>GROWTH</i>	1.405	1.002	0.926	-2.865	22.530
<i>LOSS</i>	0.368	0.000	0.482	0.000	1.000
<i>SUBS</i>	1.841	1.000	0.828	0.000	17.000
<i>Big4</i>	0.368	0.000	0.482	0.000	1.000
<i>CHANGE</i>	0.545	1.000	0.498	0.000	1.000
<i>UNQUALIFIED</i>	0.847	1.000	0.360	0.000	1.000

Notes: All continuous variables are winsorised at the 1% and 99% levels each year to remove the potential influence of outliers.

Univariate Analysis

The *t*-test analysis presented in *Panel A* of Table 4 is conducted by splitting the sample into two sub-samples: fair value sample and cost model sample using the *FVA* variable. Based on the analysis, the total fair value-oriented firms is 172 compared to 50 firms that follow the HC model. The mean difference of audit fees between the two sub-samples is highly significant (*t*-value = -20.31). According to agency theory, this outcome confirms the fact that higher risks of inherent uncertainties emerged following the application of the FVA caused by management bias. Therefore, auditors respond on this greater complexity and risk in auditing fair values by spending extra time and effort, ultimately demanding higher audit fees (Sangchan et al., 2020; Goncharov et al., 2014). Panel B presents the significance of the mean difference of audit fees with reference to fair value hierarchy disclosure amongst the sample using the *HIERARCHY* variable. Clearly, 139 out of 222 firms fully comply with fair value hierarchy disclosure requirements. Statistically, the mean difference between the two sub-samples is found to be significant (*t*-value = -19.10). Clearly, the results of the *t*-test indicate that companies with fair value hierarchy disclosures are more likely to bear expensive audit fees relative to firms that do not. The further expansion of fair value application leads to greater audit fees being paid as auditors, who in this case, are more cautious when auditing the controversial fair values to provide accurate financial information for stakeholders and maintain their reputation (Alexeyeva & Mejia-Likosova, 2016; Ettredge et al., 2014).

Table 4
Univariate analysis

Dependent variable	Mean		<i>t</i> -value (sig.)
Panel A: fair value model vs cost model	<i>FVA</i> = 1 N = 172 firm	<i>FVA</i> = 0 N = 50 firm	
LnAFEES	9.33	8.47	-20.31***
Panel B: hierarchy disclosure vs. non-hierarchy disclosure	<i>HIERARCHY</i> = 1 N = 139 firm	<i>HIERARCHY</i> = 0 N = 83 firm	
LnAFEES	9.40	8.70	-19.10 ***

Notes: *, ** and *** denote 0.10, 0.05 and 0.01 significance, respectively.

FVA = dummy variable coded as 1 if firm's assets are reported in fair values, 0 otherwise; HIERARCHY = dummy variable coded as 1 if firm has fair value hierarchy levels disclosure, 0 otherwise.

Correlation Analysis

Table 5 presents the Pearson and Spearman correlation matrix results for the dependent and independent variables in order to examine the bivariate association between the sample variables. The test for multicollinearity confirms there is no correlation problem between the independent variables used in each model. As shown in Table 5, the bivariate analysis confirms that the correlation coefficients of *LnAFEES* with all fair value variables (*FVA*, *FVA_TA*, *FVA1_TA*, *FVA2_TA*, *FVA3_TA*) are significant and positive. The analysis also confirms that both crisis proxies employed in this study are significantly associated with the magnitude of audit fees. The correlation coefficient between the independent variables used in each model confirms that the independent variables are generally not correlated. Moreover, the mean of the VIF test does not show any potentially serious multicollinearity problem, where the mean of VIF of each model is below 3.

Regression Analysis

Table 6 presents the OLS regression results for the tested models where the dependent variable is the natural log of audit fees (*LnAFEES*). The independent variables of interest are the presence of FVD (*FVA*), the proportion of fair-valued assets (*FVA_TA*) and fair value inputs (*FVA1_TA*, *FVA2_TA*, *FVA3_TA*). The moderating variables are the GFC variables; pre-crisis (*PRECRISIS*) and post-crisis (*POSTCRISIS*). As shown in Table 6, the *P*-value of the tested models (1–7) is highly significant at the 0.01 level ($Prob.>F = 0.000$) with reasonable explanatory power of each model ranging from 59% to 63% similar to Sangchan et al. (2020).

As expected, the regression results shown in Model (1) of Table 6 confirm that *FVA* has a significant positive coefficient at the 0.01 level (Coeff. = 0.485, $t = 18.79$), which confirms the fact that the presence of FVD by Jordanian firms' is positively significantly associated with audit fees. This result is consistent with the univariate analysis discussed in Panel A of Table 4 above implying that audit fees paid by fair value-oriented firms are statistically higher than those paid by historical cost-oriented firms in Jordan (Abdullatif, 2016). This conclusion is in line with Sangchan et al. (2020) who came to the same conclusion. However, this finding is inconsistent with Goncharov et al. (2014). The inconsistent findings, in this respect, could be caused by the difference in the nature of fair valued accounts examined by the current study (financial assets) and by previous studies (non-current assets). Furthermore, the results also may be driven by the nature of the real estate industry in the developed

Table 5
Correlation matrix

No.	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	LnAFEES	1	0.352**	0.012	0.001	0.115**	0.074**	-0.062**	0.038*	0.718**	0.235**	-0.186**	0.421**	-0.051**	0.271**	0.487**	0.096**	-0.027
2	FVA	0.366**	1	0.318**	0.286**	0.135**	0.121**	0.000	0.000	0.165**	0.131**	-0.069**	0.098**	0.041*	0.105**	0.093**	0.009	-0.019
3	FVA_TA	0.209**	0.728**	1	0.862**	0.404**	0.215**	0.110**	-0.108**	-0.132**	0.036*	-0.006	-0.084**	0.062**	-0.027	-0.037*	-0.002	-0.067**
4	FVA1_TA	0.210*	0.577**	0.807**	1	0.179**	0.125**	0.132**	-0.128**	-0.175**	0.030	-0.003	-0.058**	0.063**	-0.020	-0.054**	0.005	-0.074**
5	FVA2_TA	0.269**	0.340**	0.426**	0.434**	1	0.133**	-0.005	-0.003	0.089**	0.026	-0.010	0.031	0.004	-0.004	0.107**	0.032	0.024
6	FVA3_TA	0.252**	0.195**	0.179**	0.143**	0.209**	1	-0.015	-0.002	0.038*	-0.029	0.039*	0.003	0.011	0.090**	0.047**	-0.019	-0.005
7	PRECRISIS	-0.105**	0.000	0.098**	0.079**	-0.057**	-0.081**	1	-0.701**	-0.045*	0.097**	-0.122**	-0.079**	0.079**	-0.104**	-0.138**	-0.361**	-0.120**
8	POSTCRISIS	0.079**	0.000	-0.112**	-0.090**	0.044*	0.091**	-0.701**	1	0.030	-0.094**	0.118**	0.083**	-0.076**	0.109**	0.113**	0.355**	0.149**
9	LnASSET	0.609**	0.152**	-0.017	-0.065**	0.141**	0.200**	-0.055**	0.033	1	0.278**	-0.263**	0.417**	-0.040*	0.325**	0.455**	0.097**	0.001
10	ROI	0.222**	0.131**	0.075**	0.036*	0.052**	0.029	0.097**	-0.093**	0.257**	1	-0.576**	0.110**	0.039*	-0.108**	0.148**	0.028	-0.139**
11	LOSS	-0.169**	-0.069**	-0.036*	-0.022	-0.030	-0.004	-0.122**	0.118**	-0.233**	-0.576**	1	-0.086**	-0.042*	0.091**	-0.096**	-0.062**	0.192**
12	LEV	0.376**	0.098**	0.004	0.043*	0.184**	0.077**	-0.078**	0.082**	0.349**	0.111**	-0.086**	1	-0.008	0.013	0.191**	0.086**	0.041*
13	GROWTH	0.081**	0.070**	0.024	0.045*	0.061**	0.009	0.130**	-0.133**	0.126**	0.274**	-0.292**	0.097**	1	-0.007	-0.046*	-0.046*	-0.037*
14	SUBS	0.319**	0.117**	0.038*	0.054**	0.087**	0.194**	-0.135**	0.141**	0.387**	-0.073**	0.085**	0.061**	-0.032	1	0.140**	0.058**	0.191**
15	Big4	0.487**	0.093**	0.017	0.020	0.171**	0.165**	-0.138**	0.113**	0.430**	0.149**	-0.096**	0.190**	0.038*	0.167**	1	-0.048**	-0.017
16	CHANGE	0.101**	0.009	-0.024	-0.003	0.007	-0.010	-0.361**	0.355**	0.099**	0.029	-0.062**	0.086**	-0.055**	0.050**	-0.048**	1	-0.013
17	UNQUALIFIED	0.009	-0.019	-0.075**	-0.099**	-0.017	0.014	-0.120**	0.149**	0.038*	-0.140**	0.192**	0.041*	-0.113**	0.224**	-0.017	-0.013	1

Notes: This table presents both Pearson (upper catercorner) and Spearman (lower catercorner) correlation matrix results amongst the dependent and independent variables. All continuous variables are winsorized at the 1% and 99% levels each year to reduce the potential influence of outliers. ** and * represent that correlation is significant at the 0.01 and the 0.05 levels (2-tailed), respectively.

economies where most operating firms are fair value-oriented. In this case, auditors have been well-prepared through auditing fair value accounts for a long time; thus, higher audit fees in such contexts might not be driven mainly by the fact of auditing complexity and risk of fair values.

In the real estate industry, the major audit risk is driven by the complex depression and impairment tests, obligated by the HC model, which requires additional time, effort and experience from auditors, ultimately leading to more expensive audit fees (Goncharov et al., 2014). Referring to theory, the regression outcome is aligned with the integration of both agency and signalling theories, suggesting that the adoption of FVD results in raised agency costs since audit fees are considered to be an agency cost. Auditors came under additional burden to provide an assurance of fair values prepared by managers to eliminate the information asymmetry problem (Griffith, 2020). Thus, they are acting as a monitoring tool that sends signals to stakeholders for the purpose of decision-making. Consequently, auditors ask for expensive audit fees to compensate for their extra effort to assess reputational risks, and the time spent confirming FVEs (Oyewo et al., 2020; Oyewo, 2020). Hence, H1 is accepted.

Model (2) of Table 6 confirms that the association between the proportion of fair-valued assets and audit fees is highly significant at the 0.01 level (Coeff. = 0.219, $t = 3.28$). This result is in line with other studies (Ettredge et al., 2014; Yao et al., 2015). With the passage of FVA, greater disclosures are required; thus, further time and effort to consider the inherent risks and complexity is correspondingly required from the auditors. The result supports the agency theory notion in that auditors in the context of applying FVDs are the main party responsible for diminishing the risk of assets overestimated caused by the agency conflict. Contrarily, this result is inconsistent with Alexeyeva and Mejia-Likosova (2016), Sangchan et al. (2020) and Goncharov et al. (2014). Specifically, Alexeyeva and Mejia-Likosova (2016) failed to find a significant relationship between the proportions of fair-valued assets on audit fees. In the meantime, Sangchan et al. (2020) and Goncharov et al. (2014) confirmed there is a significant association with a negative sign. The main cause of the ambiguous results is that such analyses used differently structured fair-valued assets from those employed in the current study. The regression result indicates that auditors in Jordan expend more time and effort in evaluating fair-valued assets due to the complexity and risks they face. Furthermore, the result supports Abdullatif and Al-Rahahleh's (2020) argument who asserted that fair value is aggressively used by Jordanian firms to serve managers' interests due to the agency problem. Since the most controversial aspect of IFRSs is FVA (Ball, 2016; Khelif & Achek, 2016), this finding is

similarly consistent with Abu Rishah and Al-Saeed's (2014) conclusion who confirmed that the audit fees paid by Jordanian firms are significantly associated with the application of IFRS. Thus, H2(a) is accepted.

With respect to the nature of the relationship between reporting different levels of fair-valued assets and audit fees, the analysis results presented in Model (3) of Table 6 confirm that fair value Level 1 input is highly significant with a positive sign at the 0.01 level (Coeff. = 1.400, $t = 1.31$), and fair value Level 3 inputs are also highly significant with a positive sign at the 0.05 level (Coeff. = 0.639, $t = 7.87$). However, the analysis failed to find a significant relationship between the proportion of total fair-valued assets using Level 2 and audit fees with a positive coefficient (Coeff. = 0.024, $t = 0.07$). Outcomes are consistent with the univariate analysis results discussed above in Panel B of Table 4 and greatly aligned with the recent evidence reported by Huang et al. (2020). They confirmed the significant role of both Level 1 and Level 3 assets on accounting restatement. Likewise, Lin et al. (2017) concluded that reporting the less reliable fair value levels (Level 3) of financial assets causes significant risks of managerial manipulation and errors which subsequently leads to accounting restatement.

Contrary to the US banking industry evidence provided by Ettredge et al. (2014) where most complex and risky fair-valued asset input level is Level 2, the current study finds that the total portfolio of fair-valued assets is dominated by Level 1 which is in line with Alexeyeva and Mejia-Likosova (2016). Following Ettredge et al. (2014), fair value input level with a higher mean is more likely to have a strong explanatory power regarding audit fees. Consistently, the result means that Jordanian firms using Level 1 raises audit fees and the descriptive statistics above demonstrates that the mean of Level 1 is higher than both Level 2 and Level 3. Consistent with other research (Alexeyeva & Mejia-Likosova, 2016; Ettredge et al., 2014; Goncharov et al., 2014; Sangchan et al., 2020), fair-valued assets Level 3 emerge as significant with a positive sign. However, the finding in relation to Level 2 fair-valued assets is quite similar to Alexeyeva and Mejia-Likosova (2016).

In order to test H2(b), an F -test has been undertaken following Alexeyeva and Mejia-Likosova (2016) and Ettredge et al. (2014), in order to identify whether there is a significant difference in the three fair value levels coefficients. As shown in Table 6, the F -test confirms the highly significant difference between the coefficients of the three levels of fair value (p -value = 0.000). This result is in line with Alexeyeva and Mejia-Likosova (2016) and Ettredge et al. (2014). It means that low and highly uncertain fair-valued

assets exert a different impact on audit fees. Similar to Alexeyeva and Mejia-Likosova (2016) and Ettredge et al. (2014), the *F*-test below confirms that the coefficients on *FVA1_TA* and *FVA2_TA* are not different (p -value = 0.4290). However, the coefficient on *FVA3_TA* is greater than either of the other two coefficients Level 1 and Level 2 where the p -value = 0.0446 and 0.000, respectively.

Overall, it can be concluded that the regression results are in line with agency theory where using highly uncertain and subjective fair values, such as Level 3 leads to rising agency costs, resulting in greater auditor effort and time spent in auditing FVEs. This situation leads to auditors bearing additional costs and litigation risks (Bratten et al., 2013; Sangchan et al., 2020). In Jordan, the risk of auditing fair values is becoming higher, particularly for Level 3 fair value inputs which results in increasing auditors' burden and eventually drives audit prices up (Abdullatif, 2016). Hence, H2(b) is accepted.

As shown in models (4–5) of Table 6, the significant negative (positive) effect of the pre-crisis (post-crisis) period on the relationship between the proportion of fair-valued assets and audit fees is confirmed at the 0.01(0.10) level Coeff. = -0.405 , $t = -2.84$ (Coeff. = 0.229 , $t = 1.77$). Specifically, this means that the relationship between fair value and audit fees weakens at the time before the crisis begins (pre-crisis); however, the relationship strengthens following the crisis period (post-crisis) due to the criticism of the FVA model. In this respect, some commentators stated that most of the GFC-related problems were caused by the sheer complexity and ambiguity of financial instruments following the adoption of *IAS 39* (Allen & Carletti, 2008a; Plantin et al., 2008). This subsequently weakened supervision of auditors and managers following this controversial model's application (Huang et al., 2016). The result confirms the arguments that using the mark-to-market accounting practices led to escalating the effect of the credit crisis through increasing market earnings volatility (Haswell & Evans, 2018). This was due to assets whose values had fallen dramatically. The regression analysis result may be driven by the fact that following the GFC the global accounting institutions and regulatory authorities' rules continued to include FVA projects.

For the purpose of reducing the information asymmetry problem and as a response to the crisis, new accounting and auditing standards were developed by the IASB and FASB. For example, in 2009, the *ISA 540 – Auditing Accounting Estimates and Related Disclosures* were enacted by the International Auditing and Assurance Standards Board (IAASB) (IAASB, 2009). ISA 540 increased the responsibilities of external auditors and underlines the typical

audit approach for auditing FVEs. Later, IFRS 13 was issued to improve fair value application and emphasise the hierarchy disclosures (IAS Plus, 2020). The effort in updating IFRS 13 and the continuous emphasis of IFRS over the development of FVA with important related issues of FVM in the absence of an active market has not ended the debate against the fair value model (Huang et al., 2020). Therefore, the requirements regarding ‘fair value hierarchy’ multiplied the complexity of FVEs which also continued to raise concerns and correspondingly increase the audit prices. More time and effort are needed to ensure the validity of fair value figures to curtail the agency problem (Griffith, 2020). Hence, the analysis rejects the null H3(a) and H3(b).

Models (6–7) of Table 6 present the regression results of the two crisis periods on the association between fair value hierarchy inputs and audit fees. *F*-test is also employed to identify whether there is a significant difference in the coefficients of the moderating role of the crisis periods (pre-and-post-crisis) among the three fair value levels. Model (6) confirms the significant negative effect of the pre-crisis period on the relationship between the proportion of fair-valued assets through Level 1, Level 2 and Level 3 and audit fees where Level 1 has Coeff. = -0.471 , $t = -2.81$, Level 2 has Coeff. = -1.303 , $t = -1.64$, and Level 3 has Coeff. = -2.516 , $t = -0.89$. The analysis confirms that there is a weak association between fair value inputs and audit fees during the period preceding the GFC. The *F*-test confirms that the coefficient of the interaction of the pre-crisis period with each hierarchy level is not equal (p -value = 0.0512). The test also finds that the coefficients on the interaction of the pre-crisis period with *FVA2_TA* cannot be differentiated from the interaction with Level 1 (Level 3) where: p -value = 0.1615 (p -value = 0.1754). The coefficient on *FVA3_TA* is significantly greater than the coefficients of Level 1 where p -value = 0.0442. Collectively, the *F*-test confirms that the association between the low and high uncertainty fair-valued assets and audit fees are affected in different ways by the pre-crisis period.

Model (7) confirms the significant positive effect of the post-crisis period on the relationship between the proportion of fair-valued assets through Level 1 and audit fees at the 0.05 level with Coeff. = 0.309 , $t = 1.96$. Conversely, it failed to find any significant effect of the post-crisis with a positive sign in relation to Level 2 where Coeff. = 0.662 , $t = 0.99$ and Level 3 where Coeff. = 0.758 , $t = 0.360$. This outcome is consistent with the fact that Level 1 assets constitute the overwhelming type of fair-valued assets held by Jordanian businesses. The *F*-test also confirms that the coefficient of the interaction term of the post-crisis period with each hierarchy level is not equal (p -value = 0.0032). The test also confirms that the coefficients on the interaction of the post-crisis

Table 6
OLS regression results

DV = <i>LnAFEES</i> Variables	Model (1) (Huber-White's S. estimator)	Model (2) (Huber-White's S. estimator)	Model (3) (Huber-White's S. estimator)	Model (4) (Huber-White's S. estimator)	Model (5) (Huber-White's S. estimator)	Model (6) (Huber-White's S. estimator)	Model (7) (Huber-White's S. estimator)
Intercept	2.746 (20.55)***	2.882 (20.65)***	2.798 (20.51)***	2.853 (20.47)***	2.896 (20.69)***	2.794 (19.86)***	2.754 (19.33)***
<i>FVA</i>	0.485 (18.79)***						
<i>FVA_TA</i>		0.219 (3.28)***		0.346 (4.41)***	0.092 (0.920)*		
<i>FVAI_TA</i>			1.400 (1.310)***			0.676 (6.62)***	0.353 (3.01)**
<i>FVA2_TA</i>			0.024 (0.070)			0.002 (0.000)*	0.691 (1.260)*
<i>FVA3_TA</i>			0.639 (7.87)**			1.266 (1.060)**	0.244 (0.150)
<i>PRECRISIS</i>				0.000 (0.000)		0.016 (0.270)	
<i>POSTCRISIS</i>					-0.032 (-0.540)		-0.045 (-0.760)
<i>PRECRISIS*FVA_TA</i>				-0.405 (-2.84)***			
<i>POSTCRISIS*FVA_TA</i>					0.229 (1.770)*		

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Table 6 (continued)

DV = <i>LnAFEES</i> Variables	Model (1) (Huber-White's S. estimator)	Model (2) (Huber-White's S. estimator)	Model (3) (Huber-White's S. estimator)	Model (4) (Huber-White's S. estimator)	Model (5) (Huber-White's S. estimator)	Model (6) (Huber-White's S. estimator)	Model (7) (Huber-White's S. estimator)
<i>PRECRISIS* FVAI_TA</i>						-0.471 (-2.81)***	
<i>PRECRISIS* FVA2_TA</i>						-1.303 (-1.640)*	
<i>PRECRISIS* FVA3_TA</i>						-2.516 (-0.980)**	
<i>POSTCRISIS* FVAI_TA</i>							0.309 (1.960)**
<i>POSTCRISIS* FVA2_TA</i>							0.662 (0.990)
<i>POSTCRISIS* FVA3_TA</i>							0.758 (0.360)
<i>LnASSET</i>	0.327 (41.16)***	0.335 (40.85)***	0.335 (40.07)***	0.329 (39.82)***	0.335 (40.77)***	0.342 (40.97)***	0.342 (40.94)***
<i>ROI</i>	0.000 (2.42)**	0.000 (4.66)***	0.000 (3.70)***	0.000 (4.86)***	0.000 (4.76)***	0.000 (4.36)***	0.000 (4.33)***
<i>LOSS</i>	0.049 (1.450)	0.090 (2.59)***	0.096 (2.74)***	0.101 (2.89)***	0.092 (2.63)***	0.092 (2.64)***	0.091 (2.61)***
<i>LEV</i>	0.000 (10.08)***	0.000 (10.53)***	0.000 (11.74)***	0.000 (10.87)***	0.000 (10.57)***	0.000 (10.73)***	0.000 (10.65)***

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Table 6 (continued)

DV = <i>Ln</i> <i>A</i> / <i>FEE</i> S Variables	Model (1) (Huber-White's S. estimator)	Model (2) (Huber-White's S. estimator)	Model (3) (Huber-White's S. estimator)	Model (4) (Huber-White's S. estimator)	Model (5) (Huber-White's S. estimator)	Model (6) (Huber-White's S. estimator)	Model (7) (Huber-White's S. estimator)
<i>GROWTH</i>	-0.008 (-2.11)**	-0.008 (-2.13)**	-0.007 (-1.930)*	-0.009 (-2.23)**	-0.008 (-2.10)**	-0.008 (-2.08)**	-0.008 (-2.11)**
<i>SUBS</i>	0.015 (3.96)***	0.018 (4.71)***	0.020 (5.12)***	0.018 (4.60)***	0.018 (4.72)***	0.017 (4.49)***	0.017 (4.47)***
<i>Big4</i>	0.401 (16.65)***	0.415 (16.79)***	0.426 (17.34)***	0.418 (16.72)***	0.416 (16.79)***	0.411 (16.59)***	0.414 (16.69)***
<i>CHANGE</i>	0.069 (2.99)***	0.080 (3.36)***	0.086 (4.05)***	0.093 (3.88)***	0.080 (3.37)***	0.072 (3.02)***	0.072 (3.03)***
<i>UNQUALIFIED</i>	-0.079 (-2.66)***	-0.070 (-2.31)**	-0.099 (-3.28)***	-0.072 (-2.35)**	-0.067 (-2.19)**	-0.064 (-2.10)**	-0.064 (-2.10)**
Coefficient comparisons for Model (3)							
<i>FVA1_TA = FVA2_TA = FVA3_TA</i>	F-stat			p-value			
	(29.33)***			0.0000			
<i>FVA1_TA = FVA2_TA</i>	(00.63)			0.4290			
<i>FVA2_TA = FVA3_TA</i>	(03.11)**			0.0446			
<i>FVA1_TA = FVA3_TA</i>	(38.60)***			0.0000			

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Table 6 (continued)

Coefficient comparisons for Models (6–7), respectively		F-stat	p-value	F-stat	p-value
$FVA1_TA * PRE/POSTCRISIS = FVA2_TA * PRE/POSTCRISIS = FVA3_TA * PRE/POST$		(2.97)*	0.0512	(4.60)***	0.0032
$FVA1_TA * PRE/POSTCRISIS = FVA2_TA * PRE/POSTCRISIS$		(1.96)	0.1615	(0.65)	0.4200
$FVA2_TA * PRE/POSTCRISIS = FVA3_TA * PRE/POSTCRISIS$		(1.84)	0.1754	(2.23)	0.1075
$FVA1_TA * PRE/POSTCRISIS = FVA3_TA * PRE/POSTCRISIS$		(4.05)**	0.0442	(4.55)***	0.0106
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	3108	3108	3108	3108	3108
F-test	(25)***	(27)***	(26)***	(30)***	(30)***
Prob > F	0.000	0.000	0.000	0.000	0.000
R ²	63%	59%	58.99%	59.56%	59.44%
Mean VIF	1.76	1.77	1.87	1.82	2.10

Notes: ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test. This table presents the OLS regressions of log of audit fees (LnAFEEs) paid by Jordanian firms over the study period (2005–2018) on FVD, and the interaction of pre-crisis and post-crisis variables with the proportions of fair-valued assets (and by input Levels) controlled by year and industry fixed effects with Huber–White *t*-statistics to adjust for heteroscedasticity.

period with *FVA2_TA* are not differentiated from the interaction with Level 1 (Level 3) where: p -value = 0.4200 (p -value = 0.1075). The coefficient on *FVA3_TA* is greater than the coefficients of Level 1 p -value = 0.0106. This result is in line with several scholars (Alexeyeva & Svanström, 2015; Xu et al., 2013; Zhang & Huang, 2013) who found that the GFC led to greater market volatility which endangered the reliability of FVMs. The belief is consistent with Bratten et al. (2013) who stated that fair value audit risk became higher, particularly for Level 3 fair value inputs. Consequently, the auditors' burdens increased and eventually drove audit prices up (Xu et al., 2013). Hence, the analysis rejects the null H4(a) and H4(b). The coefficients of the control variables of all models have the expected magnitude and signs consistent with prior literature.

In general these conclusions are in line with the triangulation of the agency, signalling and stakeholder theories. This was the case given that the auditing profession and accounting bodies emphasised to the contribution of FVA to the crisis. Expensive audit fees are linked with the further reforms released following the crisis to deal with the problem of huge market volatility. Such reforms have increased individual auditors' burdens. For this reason, additional time and effort is needed to ensure the validity of fair value figures to reduce the information asymmetry problem caused by agency conflict (Griffith, 2020; McDonough et al., 2020).

SENSITIVITY ANALYSIS

To improve the validity of the multivariate regression results, a number of robustness analyses and additional checks are carried out. First, Models (2–7) were re-tested excluding HC firms from the total sample. Untabulated regression results were not substantially different from ones reported in the main analysis. Second, following Alexeyeva and Mejia-Likosova (2016) and Goncharov et al. (2014), Model (3) has been re-tested using the aggregate Level 2 and Level 3 assets variable (*FVA23_TA*). *FVA23_TA* is the sum of the firm's total fair-valued assets using Level 2 and Level 3 inputs deflated by total assets. Untabulated results support the primary analysis outcome which documented a significant positive association between less verifiable fair-valued assets (*FVA23_TA*) and audit fees (Coeff. = 0.674, Robust t = 8.77). Third, Models (4–5) were re-tested using the *FVA* variable. Untabulated regression results confirm that the *PRECRISIS* interaction term is highly significant with a negative sign (Coeff. = -0.853, Robust t = -13.97), while the *POSTCRISIS* interaction term emerges as being highly significant with a positive sign (Coeff. = 0.800, Robust t = 14.57). Overall, the results are robust

with respect to this alternative specification of the independent variable and support the fact that the effect of the GFC varies across fair value-oriented versus the non-fair value-oriented firms. Fourth, following Alexeyeva and Mejia-Likosova (2016) and Goncharov et al. (2014), the hypotheses were re-tested after excluding the firm-year observations for the crisis year of 2008. Untabulated results remain consistent with the primary analyses. Fifth and finally, to account for the potential self-selection bias of Big 4 in the primary audit fees models, Heckman's two-stage estimator is conducted (Heckman, 1979). The *Big4* variable was included separately as the dependent variable in the probit regression model. Then, Models (1–3) are modified in the second stage of the Heckman test by adding the Inverse Mills Ratio variable (*INVMILLS*) computed from the probit regression. Untabulated findings of the second-stage estimation confirm that the sign and coefficients of the presence (Coeff. = 0.535, Robust $t = 17.84$) and the proportion of fair-valued assets (Coeff. = 0.306, Robust $t = 4.22$) and hierarchy disclosure variables (Level 1: Coeff. = 0.630, Robust $t = 7.96$, Level 2: Coeff. = 0.406, Robust $t = 1.460$ and Level 3: Coeff. = 2.347, Robust $t = 2.88$) remain unchanged after controlling for self-selection bias.

CONCLUSION

Using hand-collected data of 3108 firm-year observations from 222 Jordanian firms for the period 2005 to 2018, this article investigates the link between FVD and audit fees, and the effect of the GFC on this relationship. The findings confirmed the positive impact of the presence of FVD, and the proportion of fair-valued assets on audit fees. The analysis findings are consistent with the hypothesised scenario in which audit fees are higher for firms with larger ratios of less verifiable fair values (Level 3). The analysis, further, confirmed the significant negative (positive) effect of the pre-crisis (post-crisis) period on the association between fair-valued assets and audit fees. When the regression results were controlled by the potential endogeneity problem of auditor self-selection, the regression results still reveal the positive effects of FVD proxies and audit fees. Furthermore, the regression confirmed moderating pre-crisis exerted a negative impact on the hierarchy levels, whereas a positive impact of post-crisis is documented and significant only for Level 1.

Overall, the results support that fair value-oriented firms are more likely to have higher levels of audit complexity and risk which ultimately increases the amount of charged audit fees. The findings are valuable to academics, the audit profession, government agencies and regulatory authorities that monitor

and regulate the external audit profession in Jordan. This study's findings are generalisable to other contexts and in fact those ME countries with similar cultural and institutional characteristics, and the same accounting and auditing practices. It is worth extending the current FVA empirical evidence and considering the impact of further proxies of fair value accounts, corporate governance and ownership structure mechanisms on the auditing profession. Such considerations contribute to a comprehensive understanding of the post-implementation effects of FVA. It will also be interesting to extend this examination to wider a time frame so that the potential effect of economic volatility during the devastating COVID-19 pandemic is captured.

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