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Audit quality, debt financing, and earnings management: Evidence from Jordan[☆]

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ABSTRACT

This paper presents the initial evidence regarding the relationship between audit quality, debt financing, and earnings management in Jordan. The study used the cross-sectional version of the modified Jones model, in which discretionary accruals were employed as a proxy for earnings management. Generalised least squares regression was employed to examine the influence of audit quality and debt financing on earnings management using a sample comprising 72 industrial companies during the selected period from 2006 to 2012. The results suggested that audit quality (auditor tenure, size, specialisation, and independence) and debt financing (low debt) diminish the potential of earnings management, and, in turn, enhance the financial reporting quality. Invariably, high debt would raise earnings management risk. This research raises probable implications for policy-makers in Jordan and other countries to consider in formulating a more comprehensive and reliable audit system.

1. Introduction

Earnings management is of considerable interest to company stakeholders, especially when earnings are frequently deemed to be suitable forecasters of financial reporting quality (FRQ), since accounting accruals are instructive around FRQ. Nevertheless, accruals might also perform as unreliable forecasters of FRQ due to possible bias and manipulation. Audit quality plays an important role in reducing earnings management since auditors perform a certification task concerning financial statement credibility. Moreover, since debt influences managerial inducements and reporting selections, the association between debt and FRQ relies on accruals.

This paper presents an investigation into relations among three widely researched areas, namely audit quality, debt financing, and earnings management. Even though only a few researchers empirically investigated whether audit quality and debt financing are related to earnings management, there have been other studies that assume that such an association occurs. For example, [Lin and Hwang \(2010\)](#) specified that audit quality has a significant negative association with earnings management, while [Arens, Beasley, and Alvin \(2010\)](#), and [Messier, Glover, and Prawitt \(2008\)](#) contended that the audit function helps to alleviate the information asymmetry and conflict of interest that occur amid shareholders and managers. On the other hand, [Pope \(2003, p. 281\)](#) stated that “the balance between debt and equity financing will produce demands for accounting information and may explain differences in disclosure patterns”. Likewise, [O'Brien \(1998, p. 1253\)](#) postulated that “if financial reporting exists to serve the needs of external capital providers, then we should expect differences to coincide with differences in the arrangements for providing capital”.

As suggested by agency theory, the monitoring mechanisms are assumed to align shareholders' and managers' interests and diminish conflict of interest as well as any ensuing opportunistic behaviour. In this sense, [Jensen and Meckling \(1976, p. 323\)](#) described the audit task as a vital mechanism in companies that “serves more closely to identify the manager's interests with those of

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the outside equity holders". Consequently, audit quality is assumed to perform as a monitoring mechanism that would assist in deterring managers to manipulate earnings. Contracting Theory proposes that private debt-holders force strict accounting-based restraints for restricting manipulation of fortune through these managers. This strictness is anticipated to give rise to debt. Consequently, at higher debt, there is a trade-off between advantages from reporting higher FRQ as well as for avoiding contract violations. The management is further likely to utilise accounting selection to manipulate earnings related to contract restrictions since the costs for breaching debt agreements are great when dealing with higher debt. The utilisation of accounting choice for avoiding contract breaches depresses earnings as accruals are noisy predictors for FRQ. Hence, a rise in capital market entrant monitoring is expected to guide the accruals that are further considered to be informative about the FRQ.

Jordan is a good study subject to examine for the effectiveness of audit quality and debt financing, as it has displayed immediate concerns in enhancing the pillars of corporate governance to improve FRQ. Moreover, unlike some of the other developed countries, Jordan is characterised by high ownership concentration. Due to its small capital market, Jordan depends significantly on foreign capital. Furthermore, a less liquid and small market produces more risk to foreign investors. Its geographic seclusion makes it a high probability for information asymmetry as well as rising agency costs for investors. Finally, in Jordan, higher management-ownership companies provide the management chances to isolate minority stockholders.

This study particularly examined aspects of audit quality and debt financing in Jordan associated with the earnings management relationship. There are a number of motives that sparked and drove this research. First, recent contemporary global accounting has turned into a theme attracting growing attention because of globalisation in economics and accounting criteria. Variances in country-specific attributes must be considered to induce further accounting harmonisation efficiently. Second, even though there have been studies that examined earnings management in the US setting (Ronen & Yaari, 2008); Leuz, Nanda, and Wysocki (2003) proposed that the practices of earnings management vary between countries. Therefore, supplementary international evidence can beneficially contribute to elucidate these variances. Third, this study selected the period after the Shamayleh Gate crisis (2003), as it created the need to consolidate the foundations and principles of corporate governance in the Jordanian economy. The main purpose of Reports on the Observance of Standards and Codes was to enforce the mechanisms needed to improve FRQ in Jordan (ROSC, 2005). The recommendations by the Amman Stock Exchange (ASE) to meet the challenges of corporate governance that will be facing the kingdom are expected to improve its chances for growth as well as materialised investment (ASE, 2007). Finally, the interest about FRQ and its association with audit quality is growing over time, subsequent to the scandal of particular companies due to accounting manipulation through management. Indeed, investors and regulators frequently criticise external auditors for performing minimal work as the audited financial statements had been verified as being misleading and false in several contemporary accounting collapses. Consequently, whether external auditors lead to reduced earnings management is still an open issue. Given these interests, it is imperative to examine the relationship of audit quality and debt financing with earnings management, which might possibly influence FRQ.

This research comprised an investigation of numerous aspects of the effectiveness of audit quality and debt financing with regard to earnings management. Using a sample of Jordanian quoted industrial companies for the period from 2006 to 2012; the study found evidence showing that audit quality (auditor tenure, size, specialisation and independence) has a negative influence on discretionary accruals. Such findings extend previous literature contributions, which usually documented that audit quality affects FRQ. Regarding the unique double role of debt, it is proposed that the interface of debt effect (positive and negative) will eventually decide FRQ. At lower debt, companies have the tendency to decrease debt cost through reporting high FRQ. Concurrently, companies are less likely to manipulate earnings as the hazard of a covenant violation is either less or non-existent. Thus, at lower debt, FRQ and debts are positively related as the positive debt impact controls the negative impact. On the other hand, for higher debt, FRQ and debts are negatively related, as a negative effect controls the positive impact. Since the hazard of violating a contract is greater for extremely leveraged companies, earnings are likely to be managed to evade contract breaches. Therefore, as soon as the contract breaching costs reach a certain threshold, the management would be willing to be penalised for the inferior borrowing cost of reporting high FRQ to avoid even more expensive contract breaches.

This study produced a stimulating insight. First, this research result adds to the literature on the association between audit quality and FRQ (Balsam, Krishnan, & Yang, 2003; Gul, Fung, & Jaggi, 2009; Lin & Hwang, 2010; Srinidhi & Gul, 2007) through showing that the auditor (tenure, size, specialisation, and independence) has a role to play in reducing earnings management and improving FRQ. Although this result would contribute greatly, it still does not wholly support that audit quality will constantly increase FRQ. Second, some research highlighted the FRQ role in decreasing the external financing cost (Francis, LaFond, Olsson, & Schipper, 2005; Ghosh & Moon, 2010). Although this finding proposed that companies that depend deeply on debt financing might be agreeable to greater borrowing costs for minimal FRQ, the benefits of evading possible debt contract breaching override the greater borrowing costs. Third, contrary to most earnings management research that investigated the major incentives to manage earnings, this paper directly presents the ownership structure effects on earnings management magnitude. Moreover, this research is a preliminary attempt to empirically test the impact of audit quality (tenure, size, specialisation, and independence) and debt financing (low debt and high debt) on earnings management among Jordanian listed companies. Fourth, limited studies (Fung & Goodwin, 2013) controlled for the mechanisms of corporate governance; possibly an essential correlated variable omitted in this category of research. Ashbaugh-Skaife, Collins, and LaFond (2006) documented that a company's corporate governance quality should be positively different to its associated high credit worthiness, maturities, and debt level. Finally, the results may provide beneficial information for shareholders and regulators, particularly concerning whether audit quality and debt financing facilitate earnings management and improve FRQ.

2. Literature review and hypothesis development

2.1. Earnings management

There are numerous definitions related to earnings management. Healy and Wahlen (1999, p. 368) specified that “earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”. Ronen and Yaari (2008, p. 27) defined earnings management as “a collection of managerial decisions that result in not reporting the true short-term, value-maximising earnings as known to management”.

Previous studies provide evidence that managers managed earnings for diversified motives (see, for example, Baker, Collins, & Reitenga, 2009; DeFond & Jiambalvo, 1994; Healy & Wahlen, 1999). Practitioners, as well as policy-makers, are anxious about earnings management, such as the associated asymmetric information problem, and the possible effects on shareholders' fortune, which may be diminished (Levitt, 2007).

Management have two primary methods to manipulate earnings. They can either do it in accrual based earnings management through selecting accounting strategies and assessing accruals (Holland & Ramsay, 2003; Jones, 1991; McNichols & Wilson, 1988), or they can engage in real earnings management through changing the nature and/or the level of economic activities, such as advertising, research and development, and training, to attain income objectives (Roychowdhury, 2006). In the current research, the study concentrated on the association between audit quality and debt financing, and earnings management (accruals-based), as the financial distress theory is normally benchmarked as opposed to earnings management, which is accruals-based.

2.2. Audit quality and earnings management

Ownership and control separation is associated with agency problems, and asymmetry of information among shareholders and management, which generate the requirement for external auditors. External auditors are in charge of confirming that the statements of a financial report are impartially specified according to GAAP, and revealing the firm's operating outcomes and accurate economic condition. Therefore, the confirmation of the external auditors enhances the integrity of the firm's financial statements.

A number of former studies reported a relationship between higher quality auditor measures (such as auditor tenure, auditor size, auditor specialisation, and auditor independence) and higher FRQ (Balsam et al., 2003; Ghosh & Moon, 2005; Gul et al., 2009; Krishnan, 2003; Lin & Hwang, 2010; Myers, Myers & Omer, 2003). This association depends on the justification that high auditor quality requires further effectual monitoring, which is supplementary, probably due to the doubtful accounting performance and falsifications through management more so than low auditor quality.

2.2.1. Auditor tenure

Myers et al. (2003) defined auditor tenure as the period (number of years) that the company is maintained by an auditor. According to this definition, there are three clarifications that have been produced for that particular association. First, auditors with short-tenure lack particular client information, which is essential for carrying out higher audit quality. Second, auditors demand minimum audit fees for acquiring and preserving novel clients and subsequently anticipate regaining losses in following periods from audit appointments (DeAngelo, 1981). Third, companies with higher FRQ can possibly maintain the current high auditor quality, or high auditor quality is the result of leaving problematic clients with diminished FRQ, which could reduce auditor quality thereafter (Gul, Jaggi, & Krishnan, 2007).

Contemporary auditing studies recommended that auditors with longer tenure are related to higher FRQ. For example, Johnson, Khurana, and Reynolds (2002) authenticated more unanticipated accruals as soon as auditor tenure is shortened (two to three years) and averaged (four to eight years), while they did not find evidence that longer auditor client association (nine years or higher) is related to less unanticipated accruals. Geiger and Raghunandan (2002) indicated a significantly higher audit reporting failure in the earlier years of the auditor client association than when auditors have served the same clients for longer tenure periods. Myers et al. (2003) showed that a longer auditor client association is related to a smaller dispersal in the current and discretionary accrual distributions as well as more constraints on discretionary accruals (income-decreasing and income-increasing). Ghosh and Moon (2005) highlighted that companies through lengthier auditor tenure are related to sturdier earnings response coefficients, thereby signifying that stakeholders observing the FRQ of companies with lengthier auditor tenure are relatively superior compared to the FRQ of companies with smaller auditor tenure.

Moreover, Gul et al. (2007) showed a positive relationship between non-audit fees (NAF) and auditor independence (proxied by discretionary current accruals) for companies with short auditor tenure (not more than three years). These results proposed that NAF can impair auditor independence as soon as auditor tenure is short and not once when auditor tenure is long. Furthermore, prior studies indicated that longer audit tenure is related to less discretionary accruals, signifying higher FRQ (Chen, Lin, & Lin, 2008; Gul et al., 2009; Lin & Hwang, 2010).

Carcello and Nagy (2004) did not find evidence concerning the efficiency of audit firm rotation to prevent fraudulent financial reporting. Al-Thuneibat, Issa, and Baker (2011) found a positive association between auditor tenure and discretionary accruals (proxy for audit quality). They concluded that audit firm tenure and discretionary accruals are positively associated, which signifies that the lengthier the auditor tenure, the greater the discretionary accruals, and, therefore, the lower the audit quality.

In Jordan, it has been extensively perceived that most companies maintain the same audit firm for extended periods of appointment through a common propensity for dependability, and more so in the case of achieving high quality audit reports by big

audit firms. The aforementioned studies claimed that as auditor tenure rises, the auditor is considered superior in evaluating hazards from material misstatements through gained experience and having greater insights into the client's operations and firm policies, in addition to internal monitoring on financial reporting. This leads to the following hypothesis:

H1. For Jordanian quoted companies, auditor tenure has a negative association with earnings management.

2.2.2. Auditor size

Previous studies concentrated mainly on variances among big audit and non-big audit firms. This is because higher audit firms have a higher tendency to identify and detect manager misreporting since the company may be efficiently monitored further by higher audit firms (Watts & Zimmerman, 1986), and they have a greater possibility to lose more as soon as an audit failure takes place (Bauwhede, Willekens, & Gaeremynck, 2003). Accordingly, for defending their reputation as well as for evading juristic responsibility (Behn, Carcello, Hermanson, & Hermanson, 1997), the big auditor firms will be conservative and thus curb clients from using discretionary accruals. In this sense, much previous research recommended that big audit firms diminish the magnitude of earnings management (Alzoubi, 2016a, 2016b; Gul, Tsui, & Dhaliwal, 2006; Tendeloo & Vanstraelen, 2008).

Becker, DeFond, Jiambalvo, and Subramanyam (1998), and Francis, Maydew, and Sparks (1999) debated that Big 6 audit firms are superior in identifying earnings management due to their greater knowledge, and perform with the aim of minimising earnings management to safeguard their reputation. Similarly, Krishnan (2003) argued that, in addition to additional expertise and resources to reveal earnings management, the large audit firms are more inclined to defend their reputation because of their large client base. According to Rusmin (2010), Big 4 audit firms have greater experience, human resources, technology, and capital that permit them to produce higher quality audits. Moreover, they normally have a larger client base and are globally known brand names, and, therefore, they have more motivation to maintain greater audit quality. Lin and Hwang (2010) reported a significant and negative association in the employment of the Big 6/5/4 audit firms and earnings management. Prior studies documented that a lower level of earnings management is constrained to the clients of Big 4 auditors (Francis & Wang, 2008; Francis & Yu, 2009).

In contrast, other studies document no significant association among Big 6/5/4 auditors and earnings management (Bédard, Chtourou, & Courteau, 2004; Davidson, Goodwin-Stewart, & Kent, 2005). Piot and Janin (2007) recognised that the existence of Big 5 auditors creates no variance concerning earnings management levels. Some other research found a positive relationship between big auditor firms (6/5/4) and earnings management (Alves, 2013; Antle, Gordon, Narayanamoorthy, & Zhou, 2006; Lin, Li, & Yang, 2006). These studies revealed that companies audited by big auditor firms report higher earnings management than companies audited by non-big auditor firms. Rahman and Ali (2006) documented an insignificantly positive association between Big 5/4 auditor firms and absolute discretionary accruals.

The Jordanian market trend sees companies taking advantage of international experts, which is evident by their tendency to hire big audit firms. Taken altogether, prior studies proposed that big auditor firms contribute to a decrease or increase in earnings management. Under the presumption that higher auditor quality serves as a restraint to earnings management, the next hypothesis is proposed:

H2. For Jordanian quoted companies, auditor size has a negative association with earnings management.

2.2.3. Auditor specialisation

A number of previous studies stated that client companies with industry specialists are related to higher FRQ (Balsam et al., 2003; Gul et al., 2009; Krishnan, 2003). These results are in line with the theory that auditor specialisation is a factor in different industries for attaining product distinction and producing high audit quality (Dunn & Mayhew, 2004).

High audit quality through industry specialists is associated with the reality that they operate seamlessly with the physical facilities, personnel, technologies, and organisational monitor system, which allow them to reveal misrepresentations and irregularities (Simunic & Stein, 1987). The capability to produce higher audit quality originates from the expertise in serving clients in a similar industry and frequent involvement with audit exercises within the industry (Dunn & Mayhew, 2004).

The majority of previous studies showed that clients of specialised auditors report lower discretionary accruals as compared to that documented through clients of non-specialised auditors (Balsam et al., 2003; Habbash, 2010; Krishnan, 2003; Lin & Hwang, 2010). Stanley and DeZoort (2007) specified that industry-specialised auditors are negatively associated with the probability of restatement. This finding is in agreement with other documentation that showed that decreased audit specialisation was a factor, because of the absence of client-specific information. Lim and Tan (2008) reported that specialised industry audit is more concerned about the loss of reputation and litigation exposure than non-specialists, and they take advantage of knowledge spill-overs from non-audit services provision.

Kwon, Lim, and Tan (2007) examined the auditor industry-specialised role in the international setting among 28 countries. They highlighted that clients of industry specialist auditors have less discretionary accruals as well as higher earnings response coefficients. Gul et al. (2009) perceived that the relationship among lower FRQ and shorter auditor tenure is weaker for companies audited through industry-specialists than non-specialists.

DeBoskey and Jiang (2012) reported a positive association between earnings (before provision) and loan loss provision, proposing that management banks should utilise loan loss provision for earnings smoothing in the post-SOX period. Nevertheless, that association is significantly moderated through auditor industry experience, producing strong evidence that industry expertise restrains income smoothing. In an additional test, they showed evidence that specialised auditors have a higher influence in decreasing earnings management (income-increasing). Sun and Liu (2012) indicated that the interaction of auditor industry-specialist and board

independence is significantly negative with earnings management. The findings indicated that auditor industry specialisation might be an accompaniment instead of replacement to board independence in enhancing FRQ. However, in contrast, [Johl, Jubb, and Houghton \(2007\)](#) observed a non-significant association between industry-specialised auditor and abnormal accruals.

Thus, it is rational to contemplate that auditor industry specialisation has a positive increasing influence on FRQ as compared to a non-specialist auditor. Prior studies proposed that both users and companies can take advantage when employing industry-specialist auditors, since a specialist auditor improves auditing quality as well as accounting. This discussion led to the following hypothesis:

H3. For Jordanian quoted companies, auditor specialisation has a negative association with earnings management.

2.2.4. Auditor independence

Previous studies suggested that higher fees paid through a firm to external auditors improves the economic bond among auditors and clients, and, therefore, the fees can impair auditor independence ([Frankel, Johnson, & Nelson, 2002](#); [Li & Lin, 2005](#)). The affected independence causes lower quality audit and permits more earnings management, which leads to poor FRQ.

In terms of audit fees (AF), [Bédard and Johnstone \(2004\)](#) revealed that auditors increase efforts as well as billing rates for clients, accompanied by earnings manipulation. Their finding showed a significant positive association among billing rates and elevated corporate governance problems as well as earnings manipulation. The results indicated that auditors evaluate circumstances concerning insufficient corporate governance and earnings management, and that there is an association between those valuations and AF. [Abbott, Parker, and Peters \(2006\)](#) showed that a lower AF is negatively associated with discretionary accruals, while a higher AF is positively related to discretionary accruals. Furthermore, previous literature showed a significant positive relationship between AF and discretionary accruals, indicating that an increase in AF causes an increase in discretionary accruals ([Antle et al., 2006](#); [Lin & Hwang, 2010](#); [Lin et al., 2006](#)).

[Stanley and DeZoort \(2007\)](#) specified that AF was significantly negatively associated with restatement probability. This finding was in agreement with decreased audit quality because of the absence of client particular knowledge and lower AF on novel audit appointments. [Srinidhi and Gul \(2007\)](#) contended that the auditing market is well-regulated compared to the non-auditing market since the auditing of listed companies is mandatory. They emphasised that AF was a probable factor in revealing auditing efforts that sequentially provide improved FRQ. [Alzoubi \(2016a, 2016b\)](#) and [Habbash \(2010\)](#) showed a significant negative association between AF and earnings management, proposing that, as the AF produced through client rises, the magnitude of earnings management reduces.

Certain study findings appeared to be in accordance with the view that when auditors produce a good quality audit, as revealed in more AF, earnings management is less likely. Therefore, the next hypothesis is formulated as follows:

H4. For Jordanian quoted companies, auditor independence (AF) has a negative association with earnings management.

[Larcker and Richardson \(2004\)](#) proposed that, if an independent auditor (measured by NAF) is considered separately from substitute mechanisms of corporate governance, it would provide a lack of examination of FRQ. They determined that, if a company has sturdy governance, at that time, there will be no or minimal association between NAF and earnings management. In their study, [Antle et al. \(2006\)](#) stated that NAF reduces abnormal accruals in both their UK and US samples. [Srinidhi and Gul \(2007\)](#) revealed that expected and unexpected NAF is negatively related to accruals quality. This finding suggested that NAF causes economic bonding as well as results in a decrease in quality audit. [Cahan, Emanuel, Hay, and Wong \(2008\)](#) showed that NAF is negatively related to earnings management in particular regressions. They also documented that significant growth in NAF leads to lower discretionary accruals. [Choi, Lee, and Jun \(2009\)](#) documented evidence of a negatively significant association among tax services type NAF and earnings management, and proposed that auditors' tax services provision restricts practices of aggressive accounting.

In contrast, [Frankel et al. \(2002\)](#) exposed significant and positive relationships between NAF and the level of income-increasing and income-decreasing discretionary accruals. Moreover, prior studies ([Habbash, 2010](#); [Lin & Hwang, 2010](#)) found that NAF is significantly and positively related to earnings management, and proposed that, as the level of NAF produced through a client rises, the magnitude of discretionary accruals rises.

[Ashbaugh, LaFond, and Mayhew \(2003\)](#) did not reveal a significant relationship between NAF and companies meeting analysis predictions. [Chung and Kallapur \(2003\)](#) found no significant relationship between NAF and earnings management. Therefore, they revealed that auditor independence is not reduced through NAF. Likewise, [Raghunandan, Read, and Whisenant \(2003\)](#) found no evidence supporting that NAF unsuitably affected the financial statement audit, which was afterwards restated. [Kinney, Palmrose, and Scholz \(2004\)](#) did not reveal a significant association between NAF and financial restatements.

In Jordan, auditors are permitted to afford non-audit services to clients, and these clients are requested to disclose the auditor fees amount in the financial statements. In spite of the conflict between the aforementioned studies, this study proposes the following hypothesis:

H5. For Jordanian quoted companies, auditor independence (NAF) has a positive association with earnings management.

2.3. Debt and earnings management

Firstly, a contracting proposal is proposed for a positive relationship between debt and FRQ. Debt holders request high information quality and particularly earnings for evaluating the continual borrowers' credit worthiness ([Grossman & Hart, 1982](#)). As soon as the earnings forecast FRQ precisely, creditors have minimum risk since they may assess further exact risk (bankruptcy,

liquidity, and solvency). Moreover, debt bond managers, pre-commit to higher information quality due to the reduced cost of borrowing (Diamond, 1991). As debt decreases different agency conflicts, management have few motives to disguise economic execution by employing accounting options (Harris & Raviv, 1991). Hence, debt positively impacts FRQ out of its influence on discretionary accruals, and earnings are superior forecasters of FRQ (Feltham, Robb, & Zhang, 2007).

Jensen and Meckling (1976) stated that in widely prevalent public companies, the management have a propensity to seize wealth from bondholders and shareholders. Atomistic shareholders have little desire to control management activities since the controlling costs are high while the welfare costs are nil. In contrast, a private debt-holder has the motive to control and restrict possible managerial fortune seizure. Private lenders comprising commercial banks need to be able to constantly monitor client companies through the maturity time and request higher information quality as a consequence of the requirement to evaluate their loan risks (Slovin, Sushka, & Hudson, 1990). Diamond (1991) stated that, in markets with restricted capital, companies have tendency to provide high information quality to decrease borrowing cost. Grossman and Hart (1982) deemed debt as an example of a bonding or pre-commitment mechanism. Debt bond management performs to the shareholders' advantage as a result of the motivation to evade insolvency that sequentially raises market value. Likewise, Jensen (1986) cited that debt was a disciplinary instrument. Since contractual debt payments are absorbed by free cash flows as well as decreased internal cash flows obtainable for inconvenient investing, management are incapable of transforming surplus fund cash into negative net present value schemes.

Myers (1977) proposed reducing debt maturity to ease under investment trouble. As soon as management have beneficial private information, they are expected to avoid involvement in debt financing for long-term debts as well as selected short-term debts, which is related to a drop in agency cost (Diamond, 1991). In addition, short-maturity debt monitoring was emphasised by Datta, Iskander-Datta, and Raman (2005) who contended that in the non-existence of objective alignment among shareholders and managers, further self-interest management would opt for long-term debt. Datta et al. (2005) documented that managers with additional share ownership in their companies utilise further short-maturity debt, which was argued as being in accordance with managers readily exposing themselves as well as their companies to additional monitoring. Companies that select short-maturity debts are probably associated with lower agency costs, and, consequently, these companies are less involved in earnings management. Gul and Goodwin (2010) indicated that investment grade companies with further short-maturity debt have lower audit fees, which they considered as being in line with lenders' monitoring; thus, decreasing the financial misrepresentation risk, and resulting in a decrease in fees.

Ahn and Choi (2009) documented lower earnings management for financially healthy companies for bank loans. They argued that bank monitoring is the basis of that relationship. Ghosh and Moon (2010) mentioned that total debt is significantly negatively related to earnings management for a low debt company sample; however, extremely high levels of credit worthiness are related to higher discretionary accruals. They contended that lender monitoring was the probable reason for the negative association, and that financial distress would lead to manipulated earnings being greater than lender monitoring, since credit worthiness is quite high. Fung and Goodwin (2013) reported a positive relationship between short-term debt and earnings management, which is in line with the financial distress theory for less credit-worthy companies. Moreover, they showed that the relationship is significantly weak with higher credit-worthy (investment grade) companies in accordance with the monitoring theory.

Both the agency and bonding arguments propose that the motives to document high FRQ are stronger in private debt cases as compared to public debt cases since private lenders are more likely to become controlling as well as bonding agents. Hence, management are less likely to utilise their discretion to deceive shareholders about the company's economic worth as companies have private debt; and, consequently, they have a higher tendency to dedicate their efforts to maximising the company's worth. This argument leads to the following hypothesis:

H6. For Jordanian quoted companies, low debt has a negative association with earnings management.

The second contracting proposal is that FRQ is negatively affected by debt. Since debt is comparatively high, management have a strong inclination to conceal accounting selections and documenting resolutions that decrease the probability of potential debt contract violations (DeAngelo, DeAngelo, & Skinner, 1994; DeFond & Jiambalvo, 1994). Consequently, as soon as debt is high, accounting numbers cannot be regarded realistically as the fundamental economic performance, due to the defiant utilisation of accruals with manipulated earnings, with the intent of avoiding contract violations (Klein, 2002).

As a consequence of different agency conflicts among bondholders and managers, debt holders make use of contractual preparations—a number of which are related to financial ratio—towards decreasing the appropriation of wealth by managers (Watts & Zimmerman, 1986). Bond contracts are contract preparations that protect the lender as well as constrain borrower activities. Bondholders probably depend further on the usage of contracts as being credit-worthy, thus alleviating agency conflicts. Because the defaulting debt is high, managerial opportunism has a motive to employ accounting procedures that ease the possibility of debt managers, which is anticipated to rise because of financial leverage, since previous studies produced results that indicated that leverage is related to the proximity for debt restrictions on earnings, retained earnings, working capital, and tangible net worth (Begley & Freedman, 2004; Billett, King, & Mauer, 2007).

Meanwhile, from the debt contract viewpoint, manipulating the accounting level is expected to raise the level of debt since companies attempt to evade possible contract violations. Moreover, previous research reported that the loan contracts are stricter in terms of private debt compared to public debt (Bharath, Sunder, & Sunder, 2008; Ghosh & Moon, 2010). The low cost of renegotiation produces private lenders who are more inclined to write comprehensive as well as perfect contracts and rigorous covenants (Bharath et al., 2008). Therefore, private debt companies would probably employ accounting options to evade contract violations as soon as the debt is higher (Dichev & Skinner, 2002).

As stated by DeAngelo et al. (1994), problematic corporations have sizable negative accruals associated with contractual renegotiations that produce motives to diminish earnings. Becker et al. (1998), and Saleh and Ahmed (2005) showed that debt is

significantly negatively associated with earnings management, thereby indicating that contractual renegotiations in companies with higher debt creates a motive to decrease earnings. Particular research reported a significant negative relationship between earnings management and debt (Rodríguez-Pérez & Hemmen, 2010; Zhong, Gribbin, & Zheng, 2007). This indicated that firms with high levels of debt face better monitoring through creditors and bankers, hence constraining the practice of discretionary accruals. For extremely indebted companies, it can be effectual in the case of banks for sustaining monitoring costs so as to evaluate the actual debtor quality. This is called the control hypothesis of debt limiting opportunism behaviour (Jensen, 1986). Feltham et al. (2007) proposed that earnings quality increases the debt as debt is higher and companies deliberately violate debt contracts. Nevertheless, debt has less influence on earnings quality and company worth, irrespective of whether it is extremely low or extremely high, when compared with debt covenant thresholds. Wang and Lin (2013) predicted that the funding benefits of internal capital markets from business associates with vague solvency problems result from higher leverage for individual companies with a group that sequentially alleviates their motive for earnings management.

The key implication is that FRQ reduces as private debt becomes extremely high since management opts for accounting selections that do not reveal the company's implicit economic standing. An elevated extent of managerial interference with regard to accounting selections, if it is income-decreasing or income-increasing, corrodes accruals as well as FRQ, since accruals are noisy forecasters of FRQ.¹ Thus, when debt is high, the relationship between debt and FRQ is negative. This guides the research to the following hypothesis:

H7. For Jordanian quoted companies, high debt has a positive association with earnings management.

3. Research design

3.1. Sample selection

This study population included 79 industrial companies listed on the ASE from 2006 to 2012. This period was selected based on the recommendation by the ROSC (2005) to investigate mechanisms that enhance FRQ. The industrial sector is vital for economic development. Consequently, understanding earnings management characteristics in this sector is significant for improving FRQ. Data were collected manually from the company's annual reports issued by the ASE. Furthermore, companies with insufficient audit quality,² debt, corporate governance, and financial data were excluded from this study sample. The final sample consisted of 72 companies (504 firm-years observation), which were involved in the analysis. These companies were then categorised into six industry groups, and, in line with previous studies, there was a minimum of eight firms in each type of industry. Therefore, this study combined some of the industry types to reach the minimum of eight firms.

3.2. Measurement of earnings management

Along with prior studies (McNichols, 2001), this study categorised the study scheme of earnings management studies into three classes: first, the utilised discretionary accruals (Dechow, Sloan, & Sweeney, 1995; Jones, 1991), second, the utilised specified accruals (McNichols & Wilson, 1988), third, the study of statistical attributes of earnings for indicating thresholds (Glaum, Lichtblau, & Lindemann, 2004). This research employed discretionary accruals by way of the most important proxy for earnings management.

Earnings management study has been influenced by research that accompanied the common framework of discretionary accruals, which was put forward by McNichols and Wilson (1988). The frame dividing accruals into discretionary and non-discretionary parts, which points to the supposition that an elevated magnitude of discretionary accruals (DAC) indicates that a company is involved in earnings management. A foremost regularly employed technique for decomposing accruals is the modified Jones model, which was suggested by Dechow et al. (1995). The model presumes that the non-discretionary part for the total accruals (NDAC) is the reason for the difference in revenue, regulated by the difference in receivables, as well as the magnitude of property, plant, and equipment that drive depreciation charges and working capital requests, respectively.

This research employed the modified cross-sectional Jones model version (Becker et al., 1998; Davidson et al., 2005; DeFond & Jiambalvo, 1994). Treated under this model, the magnitude of DAC of a specified company was computed as the variance among the company's total accruals as well as its NDAC, as assessed for Eq. (1):

$$NDAC_{ijt} = [\hat{\alpha}_j [1/A_{ijt-1}] + \hat{\beta}_{1j} [\Delta REV_{ijt} - \Delta REC_{ijt}/A_{ijt-1}] + \hat{\beta}_{2j} [PPE_{ijt}/A_{ijt-1}] \quad (1)$$

where $\hat{\alpha}_j$, $\hat{\beta}_{1j}$, and $\hat{\beta}_{2j}$ are industry-specified coefficients assessed from the subsequent cross-sectional regression with every two-digit

¹ Particularly, managerial judgment examples regarding accounting choices and decisions that contain estimates for uncollectible receivables, write-offs, useful life of assets, and choice of inventory method.

² As auditor industry specialisation is not able to be observed, previous research (Francis, Reichelt, & Wang, 2005) that depended upon the size of auditor in the industry as a proxy for industry expertise, relied on the supposition that the industry specialisation auditor increases according to their investment and market stocks. Since Big 4 auditors are ultimately bigger in size compared to other audit firms in nearly all industries, employing industry size as a proxy for auditor expertise will make non-Big 4 auditors non-specialised, even though those non-Big 4 auditors are certainly specialised in particular industries. Consequently, industry size should be a superior proxy for auditor's industry specialisation within big accounting companies (Francis, Reichelt, et al., 2005; Gul et al., 2009).

SIC industry groups³:

$$TAC_{ijt}/A_{ijt-1} = \alpha_j[1/A_{ijt-1}] + \beta_{1j}[\Delta REV_{ijt} - \Delta REC_{ijt}/A_{ijt-1}] + \beta_{2j}[PPE_{ijt}/A_{ijt-1}] + \varepsilon_{ijt} \quad (2)$$

where TAC_{ijt} is the total accruals for company i in industry j in year t , ΔREV_{ijt} is the change in revenue for company i in industry j between year $t - 1$ and t , ΔREC_{ijt} is the change in receivables for company i in industry j between year $t - 1$ and t , PPE_{ijt} is the gross property, plant, and equipment for company i in year t , A_{ijt-1} is the total assets for company i in industry j at the end of the prior year, and ΔREC_{ijt} is the change in receivables for company i in industry j among the year $t - 1$ and t .

The expected β_1 sign (ΔREV) is positive, as ΔREV is predictable and positively associated with variations in working capital accounts. The predictable β_2 coefficient (PPE) is negative, since the magnitude of fixed assets is anticipated to drive deferred taxes as well as depreciation expenses (Davidson et al., 2005; Klein, 2002).⁴ Having assessed NDAC (Eq. (1)), the DAC amount for company i in industry j for year t was computed as the residual value (Eq. (3)):

$$DAC_{ijt} = TAC_{ijt} - NDAC_{ijt} \quad (3)$$

This research employed a cash-flow method for assessing total accruals since this is considered to be better than the balance sheet method (Hribar & Collins, 2002). This method includes subtracting the operating cash flow from the net income amount (before extraordinary items).

Consistent with prior studies, this research applied the absolute value of DAC as a measure for the level of earnings management, which showed that the quality of research findings does not inflict any direction or sign on the anticipation of earnings management (Davidson et al., 2005; Klein, 2002).

3.3. Control variables

The study included a number of control variables that prior literature recommended as possibly having an effect on earnings management. The control variables were divided into two groups, namely, corporate governance mechanisms and firm characteristics.

One vital corporate governance function is to make certain the process of FRQ. The board of directors was identified as being the most significant management monitor mechanism (Fama & Jensen, 1983). Agency theory suggests that board capability to perform as an active monitor of the management on the domain of financial reporting depends on its independence from management. Previous studies documented a significant and negative relationship between increased board independence and earnings management (Davidson et al., 2005; Lin & Hwang, 2010). Nevertheless, Park and Shin (2004) did not reveal any significant association. Board financial expertise may have a closer relationship concerning the ways earnings may be manipulated and how to assemble essential procedures to restrain earnings management. Limited previous studies (Lin & Hwang, 2010; Park & Shin, 2004) documented a significant and negative association between increased financial expertise of board and earnings management; however, another study showed an insignificant and negative association (Xie, Davidson, & DaDalt, 2003).

A prevalent anticipation is that a higher independent audit committee would produce further monitoring of the process of financial reporting, as well as ensuring improved FRQ documentation through restricting aggressive earnings management (Lin et al., 2006). Some studies documented that the independence of the audit committee is significantly and negatively related to earnings management (Lin & Hwang, 2010; Piot & Janin, 2007), while others, such as Lin et al. (2006) and Xie et al. (2003), did not find such a significant association. Bédard et al. (2004) and Xie et al. (2003) found a significantly negative relationship between earnings management incidence and audit committee financial expertise, while others did not report any significant association (Lin et al., 2006; Rahman & Ali, 2006).

Agency theory dictates that lower levels of insider ownership indicate a defective alignment of interests among shareholders and management (Jensen & Meckling, 1976); specifically, managers have a tendency to manipulate earnings. Insider ownership may be perceived as a means to limit the managerial opportunism behaviour; thus, the magnitude of earnings management is anticipated as being negatively related to insider ownership (Klein, 2002). In contrast, the entrenchment hypothesis suggests that higher insider ownership levels can be ineffective in encouraging insiders to create value-maximising resolutions that can cause an increase in earnings management (Cornett, Marcus, & Tehrani, 2008). Agency theory proposes that monitoring throughout institutional ownership may be an imperative mechanism of corporate governance. The efficient monitoring hypothesis also proposes that institutional investors relate to superior monitoring and management actions, while decreasing the aptitude of managers to manage earnings. In this vein, much research reported that institutional ownership alleviates earnings management (Cornett et al., 2008). In contrast, certain prior studies (Sundaramurthy, Rhoades, & Rechner, 2005) documented that institutional ownership enhances managerial motives to become involved in discretionary accruals (passive hands-off hypothesis). Foreign institutional investors are normally mutual funds or additional institutional investors (Dahlquist & Robertsson, 2001). The knowledge spill-over hypothesis suggests that higher foreign ownership may restrain earnings management. This is supported

³ Adjusted for receivables, a variation was used in the anticipation model. For estimating the industry specified coefficient regression in Eq. (2), the study applied the Jones model (Davidson et al., 2005; Dechow et al., 1995).

⁴ Variables in the accruals anticipation model (Eq. (2)) were scaled through lagged assets for diminished heteroscedasticity, since it was presumed that lagged assets are positively related to disturbance term variance (Davidson et al., 2005; Jones, 1991).

by prior studies (Alzoubi, 2016a, 2016b; Chung, Ho, & Kim, 2004), as they found that companies with greater foreign ownership are less involved in earnings management. However, Ji, Ahmed, and Lu (2015) found no significant relationship between foreign ownership and earnings quality.

Firm size is forecasted as being negatively related to earnings management since higher companies could possibly have a further internal operational control system, as well as face supplementary scrutiny of the market (Ghosh & Moon, 2010; Gul et al., 2009). Conversely, other studies stated that firm size is positively associated with earnings management (Saleh & Ahmed, 2005; Wang, 2014). Firm growth is probably related to opportunism behaviours, and, therefore, a positive association with earnings management is anticipated (Gul et al., 2009; Myers et al., 2003). Jaggi, Leung, and Gul (2009) showed a negative relationship between firm growth and earnings management. Firm age is utilised to control for the variance in earnings management of companies with various life cycles (Gul et al., 2009). Gul et al. (2009) revealed that firm age and discretionary accruals are negatively correlated, whereas Wang (2014) showed a positive association.

Numerous studies, including Kothari, Leone, and Wasley (2005), specified that not employing company performance as a controlled variable in the study of earnings management can cause an invalid model and recommended that return on assets is a favourable proxy for the improvement of a company's value. Ashbaugh et al. (2003) and Habbash (2010) found a negatively significant association between return on assets and earnings management, while Ahn and Choi (2009) revealed no association in their study. For seizure performance variances in companies throughout the different industries, as well as to monitor the effect of economic activity on discretionary accruals, the current research controlled the influence of cash flow from operations. Becker et al. (1998) and Gul et al. (2009) indicated that the earnings management manipulation is less likely to take place as a firm has a strong operating cash flow execution. Similarly, Dechow et al. (1995) highlighted that the earnings management level is affected by operating cash flows in further cases.

3.4. Regression model

This research assessed the relationship between audit quality, debt financing, and earnings management by estimating the following regression:

$$\begin{aligned} DAC = & \alpha + \beta_1AUDTENU + \beta_2AUDSIZE + \beta_3AUDSPCIAL + \beta_4AUDINDAF + \beta_5AUDINDNAF + \beta_6DEBT \\ & + \beta_7DEBT^2 + \beta_8BRDINDP + \beta_9BRDFINEXP + \beta_{10}ACINDP + \beta_{11}ACFINEXP + \beta_{12}INSDOWN \\ & + \beta_{13}INSTOWN + \beta_{14}FOROWN + \beta_{15}FRMSIZE + \beta_{16}FRMGRWTH + \beta_{17}FRMAGE + \beta_{18}ROA + \beta_{19}CFO + \varepsilon \end{aligned} \quad (4)$$

The variables are as defined in Table 1.

Table 1
Operationalization of the variables.

Variables	Acronym	Operationalization
Discretionary accruals	DAC	The absolute value of the discretionary accruals measure
Auditor tenure	AUDTENU	Dichotomous with 1 if the auditor has audited the company's financial statements for at least 5 years, 0 otherwise
Auditor size	AUDSIZE	Dichotomous with 1 if the auditor is a Big 4 firm (Arthur Andersen, Deloitte Touche Tohmatsu, KPMG, Ernst and Young) and 0 otherwise
Auditor specialisation	AUDSPCIAL	Dichotomous with 1 if the companies audited through auditor whose market shares is maximum in term of clients' total asset for every industry group and 0 otherwise
Auditor independence (audit fees)	AUDINDAF	The ratio of audit fees to total fees
Auditor independence (non-audit fees)	AUDINDNAF	Dichotomous with 1 if the auditor gives additional service (consultations) and 0 otherwise
Debt	DEBT	The ratio of total debt (long-term + short-term) to total assets
Board independence	BRDIND	The proportion of outside directors (non-executive) on the board
Board financial expertise	BRDFINEXP	Dichotomous with 1 if at least one member with accounting and finance expertise and 0 otherwise
Audit committee independence	ACIND	The portion of independent (non-executive) directors on the audit committee
Audit committee financial expertise	ACFINEXP	Dichotomous with 1 if at least one member with accounting and finance expertise and 0 otherwise
Managerial ownership (insider)	INSDOWN	The proportion of the total shares owned through directors (executive) divided by the total shares
Institutional ownership	INSTOWN	The proportion of shares held through institutional investors
Foreign ownership	FOROWN	The proportion of shares owned by foreign investors
Firm size	FRMSIZE	The natural logarithm of the total assets of the company
Firm growth	FRMGRWTH	The market-to-book ratio
Firm age	FRMAGE	The natural logarithm of the company's listing years on the ASE
Return on assets	ROA	The net income divided by total asset
Cash flow from operations	CFO	The ratio of operating cash flows to total assets

4. Results and discussion

4.1. Descriptive statistics

Table 2 shows the descriptive statistics for the variables employed in this study containing the mean, minimum, maximum, median, standard deviation, skewness, and kurtosis. The information in Table 2 was produced from the pooled data sample. The mean of the absolute discretionary accruals (DAC) is 8.9%, which is higher than related studies (Balsam et al., 2003; Cahan et al., 2008; Ghosh & Moon, 2010; Gul et al., 2009), but lower than Davidson et al. (2005) who found it to be 15.6%.

The average percentage of audit tenure is 88%, indicating that most Jordanian companies are willing to preserve the same auditor for five years because of the familiarity with the company accounts and quality of work. Almost 51 companies (around 73%) are audited by Big 4 audit firms. On average, 72% of companies hire specialist rather than non-specialist auditors. The average percentage audit fees paid by the companies is 90%, indicating that most fees paid by companies are high, while 70% of the sample companies paid for additional services, such as tax consultation.

The mean of debt ratio is 18.5%. With respect to the board of directors' variables, about 61% are independent, and 83% have an accounting or finance background. Almost 65% of audit committees are independent, and only 67% have accounting and finance expertise. Regarding ownership structure, on average, insider ownership is 13% of the capital held by the manager and directors of the company, institutional ownership indicated an average value of 30% of the capital held by social security and financial institutions, whereas foreign ownership shows an average value of 15% of the capital being held by foreign institutional investors.

Firm size, on average, is 5.610 million. The average firm growth is 1.53, suggesting that the average company in the sample has good opportunity for growth. The average firm age is almost 22 years. Moreover, on average, the return on assets is 27%. Finally, these companies produce slight amounts (8%) of operative cash flow.

In order to evaluate the capability of the modified Jones model to distinguish between non-discretionary and discretionary accruals, Table 3 displays the statistical attributes of the model's coefficients. The β_1 (ΔREV) coefficient is anticipated to be positive and the β_2 coefficient (PPE) negative. Consequently, it seems that the model is particularly satisfactory and provides reasonable assessments for dividing total accruals into non-discretionary and discretionary elements (Davidson et al., 2005). The β_1 coefficient varies between 0.153 and 0.224, through a 0.004 standard deviation, and plurality observations are positive. The β_2 coefficient is correspondingly distributed, varying between -0.021 and 0.011 , with a 0.002 standard deviation, and the majority of the observations are negative.

The correlation matrix was used in this study, as shown in Table 4. None of the correlations among variables, which are proxy distinctive constructs, are adequate or extremely correlated (> 0.90) to constitute a problem with multicollinearity (Gujarati, 2003). Moreover, this study executed the variance inflation factor (VIF) test and asserted that none of the VIFs exceed 10—the threshold at which multicollinearity may be a problem (Gujarati, 2003).

4.2. Multivariate analysis

The statistical approaches for examining data are categorised into two comprehensive classifications: parametric and non-parametric. Gujarati (2003) recommended four crucial suppositions (normality, linearity, homoscedasticity, and independence of error terms) that should be considered prior to employing parametric analyses. Judge, Griffiths, Hill, and Lutkepohl (1985) stated that, as a general rule, parametric analyses are strong when all suppositions are met, and when the variables under analysis are

Table 2
Descriptive statistics ($N = 504$).

Variable	Mean	Min.	Max.	Median	Std. dev.	Skewness	Kurtosis
DAC	0.089	0.000	0.648	0.057	0.099	2.283	9.636
AUDTENU	0.887	0.000	1.000	1.000	0.317	-2.446	6.983
AUDSIZE	0.726	0.000	1.000	1.000	0.446	-1.015	2.029
AUDSPCIAL	0.718	0.000	1.000	1.000	0.450	-0.970	1.942
AUDINDAF	0.902	0.600	1.000	1.000	0.159	-1.113	2.366
AUDINDNAF	0.698	0.000	1.000	1.000	0.459	-0.865	1.748
DEBT	0.185	0.000	0.480	0.174	0.178	0.280	1.554
BRDIND	0.615	0.333	0.857	0.636	0.151	-0.529	2.363
BRDFINEXP	0.831	0.000	1.000	1.000	0.375	-1.770	4.132
ACIND	0.650	0.250	1.000	0.750	0.323	-0.172	1.327
ACFINEXP	0.667	0.000	1.000	1.000	0.472	-0.707	1.500
INSDOWNR	0.129	0.050	0.650	0.071	0.087	0.890	4.411
INSTOWN	0.304	0.075	0.450	0.305	0.110	-0.270	1.536
FOROWN	0.149	0.000	0.985	0.065	0.163	2.510	11.681
FRMSIZE	5.610	1.009	9.860	1.510	1.130	4.606	30.702
FRMGRWTH	1.531	0.130	6.540	1.250	1.031	1.623	6.196
FRMAGE	21.952	2.000	61.000	17.500	13.251	0.970	3.335
ROA	0.267	-7.811	8.841	0.053	1.820	1.031	15.812
CFO	0.088	-6.535	6.909	0.056	1.369	0.497	15.432

Table 3
Descriptive statistics for estimated regression coefficients ($N = 504$).

Cash-flow approach	Mean	Min.	Max.	Median	SD
α_j coefficient	-0.244	-80.000	-0.068	-0.085	3.556
β_1 coefficient	0.178	0.153	0.224	0.178	0.004
β_2 coefficient	-0.005	-0.021	0.011	-0.005	0.002

deliberated on an interval scale. Furthermore, Ordinary Least Squares (OLS) regression was contemplated, being a strong mechanism as the model implicates the continuous and dummy variables (Hutcheson & Sofroniou, 1999), as seen in this current research. Nonetheless, if some of the formerly aforementioned suppositions are contravened through the data essence, non-parametric analyses can be employed to make them further applicable (Balian, 1982).

Non-parametric statistical approaches may be deemed to be a substitute for the parametric methods to avoid the necessity for assembling a lot of suppositions or presumptions (parametric procedures). Non-parametric techniques are considered to be distribution free because they make no supposition concerning the distribution of scores in the population. In addition, non-parametric procedures do not require the data to be measured using an interval scale, or necessitate data being subject to strict supposition from the homogeneity and normality of variance required for the parametric techniques (Habbash, 2010; Judge et al., 1985; Zhang & Liu, 2009).

This research employs skewness and kurtosis for checking the normality supposition (Habbash, 2010). In Table 2, it may be perceived that skewness and kurtosis for specific variables display higher values. Data are deemed to be normal if the skewness is within ± 1.96 , and the kurtosis is ± 2 (Rahman & Ali, 2006). Certain variables are not normally distributed. The absence of normality of the DAC (dependent variable) is anticipated as this research intentionally does not remove the variable outliers, since companies with the highest values of earnings management could possibly produce the observations that constitute great positive accruals or great negative accruals that can indeed constitute managers' discretion. By excluding the highest observations of discretionary accruals, the research may remove those earnings management cases that are the focus of this study. Hence, normality is not considered. Rahman and Ali (2006) stated that this is anticipated in this type of research. Moreover, Kao and Chen (2004) advocated that OLS regression is not suitable as soon as the dependent variable (earnings management) is the absolute value of the discretionary accruals, which is restricted to exclusively positive values.

Table 4
Correlation matrix for variables ($N = 504$).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
DAC (1)	1.000									
AUDTENU (2)	-0.585***	1.000								
AUDSIZE (3)	-0.497***	0.343***	1.000							
AUDSPCIAL (4)	-0.717***	0.473***	0.436***	1.000						
AUDINDAF (5)	-0.727***	0.617***	0.367***	0.736***	1.000					
AUDINDNAF (6)	-0.001	0.052	0.110	-0.104	-0.055	1.000				
DEBT (7)	-0.535***	0.340***	0.234**	0.608***	0.551***	-0.157	1.000			
BRDIND (8)	-0.398***	0.177*	0.318***	0.446***	0.292***	-0.175*	0.250**	1.000		
BRDFINEXP (9)	-0.698***	0.659***	0.413***	0.590***	0.737***	-0.031	0.424***	0.287***	1.000	
ACIND (10)	-0.665***	0.423***	0.343***	0.705***	0.637***	-0.049	0.614***	0.358***	0.518***	1.000
ACFINEXP (11)	-0.705***	0.492***	0.453***	0.735***	0.715***	-0.052	0.558***	0.354***	0.581***	0.693***
INSDOWNR (12)	-0.243**	0.065	0.157	0.146	0.161	0.129	0.149	0.036	0.093	0.328***
INSTOWN (13)	-0.224**	-0.032	0.203**	0.187*	0.087	0.001	0.100	0.240**	-0.010	0.195**
FOROWN (14)	-0.161	0.062	0.065	0.053	0.073	0.070	0.054	0.015	0.051	0.064
FRMSIZE (15)	-0.035	-0.033	0.103	-0.053	-0.071	-0.037	0.046	0.032	-0.032	-0.005
FRMGRWTH (16)	-0.255**	0.238**	0.095	0.326***	0.302***	-0.082	0.364***	0.090	0.288***	0.333***
FRMAGE (17)	-0.114	0.102	0.136	0.102	0.042	-0.045	0.138	-0.064	0.029	-0.028
ROA (18)	-0.134	0.121	0.103	0.037	0.045	0.013	0.054	0.018	0.085	0.030
CFO (19)	-0.101	0.024	0.068	0.071	0.072	0.097	0.046	0.065	0.025	0.094
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
ACFINEXP (11)	1.000									
INSDOWNR (12)	0.140	1.000								
INSTOWN (13)	0.051	0.274***	1.000							
FOROWN (14)	0.124	0.372***	0.040	1.000						
FRMSIZE (15)	-0.070	0.096	0.028	0.110	1.000					
FRMGRWTH (16)	0.333***	0.069	-0.092	0.075	0.251**	1.000				
FRMAGE (17)	0.118	0.005	-0.114	0.092	0.351***	0.209**	1.000			
ROA (18)	0.166*	-0.035	0.045	-0.026	0.001	0.123	-0.020	1.000		
CFO (19)	0.058	0.096	0.021	0.064	-0.021	0.072	0.034	0.070	1.000	

Notes: ***, **, and * indicate significant at 0.01, 0.05 and 0.10 levels, respectively.

Table 5
Parametric and non-parametric regression results ($N = 504$).

DAC	Predicted sign	Random-effects GLS		Fixed-effects GLS		Fixed-effects OLS		Instrumental variables (2SLS)	
		Coef.	z-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
AUDTENU	–	–0.030	–2.97***	–0.030	–2.92***	–0.031	–2.97***	–0.030	–2.97***
AUDSIZE	–	–0.016	–2.56**	–0.016	–2.48**	–0.016	–2.56**	–0.016	–2.56**
AUDSPCIAL	–	–0.019	–1.87*	–0.019	–1.87*	–0.019	–1.87*	–0.019	–1.87*
AUDINDAF	–	–0.141	–4.98***	–0.141	–4.93***	–0.141	–4.98***	–0.141	–4.98***
AUDINDNAF	–	–0.008	–1.49	–0.008	–1.45	–0.008	–1.49	–0.008	–1.49
DEBT	–	–0.067	–2.39**	–0.071	–2.52**	–0.067	–2.39**	–0.067	–2.39**
DEBT ²	+	0.025	1.87*	0.027	1.97**	0.025	1.87*	0.025	1.87*
BRDIND	–	–0.046	–2.56**	–0.045	–2.49**	–0.046	–2.56**	–0.046	–2.56**
BRDFINEXP	–	–0.055	–5.39***	–0.055	–5.30***	–0.055	–5.39***	–0.055	–5.39***
ACIND	–	–0.038	–3.13***	–0.039	–3.18***	–0.038	–3.13***	–0.038	–3.13***
ACFINEXP	–	–0.027	–2.92***	–0.027	–2.91***	–0.027	–2.92***	–0.027	–2.92***
INSDOWNR	–	–0.034	–1.76*	–0.038	–1.87*	–0.034	–1.76*	–0.034	–1.76*
INSTOWN	–	–0.095	–4.04***	–0.097	–4.10***	–0.095	–4.04***	–0.095	–4.04***
FOROWN	–	–0.043	–2.81***	–0.043	–2.81***	–0.043	–2.81***	–0.043	–2.81***
FRMSIZE	?	–3.680	–1.76*	–3.610	–1.68*	–3.680	–1.76*	–3.680	–1.76*
FRMGRWTH	?	0.007	2.72***	0.007	2.65***	0.007	2.72***	0.007	2.72***
FRMAGE	?	–0.001	–2.36**	–0.001	–2.39**	–0.001	–2.36**	–0.001	–2.36**
ROA	?	–0.004	–2.94***	–0.004	–2.93***	–0.004	–2.94***	–0.004	–2.94***
CFO	?	–0.002	–1.15	–0.002	–1.20	–0.002	–1.15	–0.002	–1.15
Cons.		0.436	18.93***	0.438	18.69***	0.436	18.93***	0.436	18.93***
		R^2	0.748	R^2	0.748	F(19, 484)	75.640	F(19, 484)	75.640
		Wald chi2	0.000	F(19, 478)	72.390	Prob. > F	0.000	Prob. > F	0.000
		Prob. > chi2	0.000	Prob. > F	0.000	R^2	0.748	R^2	0.748
						Adj. R^2	0.738	Adj. R^2	0.738
						Root MSE	0.051	Root MSE	0.051

Notes: *Significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level.

Under the normality violation, OLS regression estimations are of no use. The standard errors assessed are biased and incompatible, and, therefore, the analyses of statistical findings are biased as well as incompatible. So long as coefficients are consistent over time, assessing employed pooled regression becomes more effective. Moreover, pooled assessment is an easy method to test the result sensitivity to substitute specifications. A main benefit for the pooled regression above a cross-section is that it permits more resilience in modelling variances into sample-specified behaviour. The second is that it causes the partiality for the generalised least squares (GLS) regression above pooled OLS regression because of the homoscedasticity with significant suppositions and no sequential correlation in pooled OLS. Owing to the estimator being considered to be constant and unbiased, pooled OLS needs the errors in every time period to be uncorrelated for the independent variables in a similar period. The GLS regression compensates for the bias of the omitted variable as well as the incidence of heteroscedasticity and autocorrelation in pooled time series data (Greene, 2007).

Two fundamental producers can be employed to explain the associations between or within each cross-section. Firstly, the OLS (fixed-effects) technique presumes that the individual consistent is a group specified consistent term in the regression model. Secondly, the GLS (random-effects) technique presumes that individual consistency is a group specified disturbance comparable to the error term, except for every group (Greene, 2007). There is a trade-off between the effectiveness of the random-effects technique and the constancy of the fixed-effects technique. The prevalent practice in economic study is to make the choice among the two techniques, depending on the Hausman (1978) assessment. The Hausman specification analysis enables the distinction between the x variables and the individual random-effects ϵ_i . The Hausman test examines for stringent exogeneity. If no correlation exists, the random-effects must be used, however if correlation occurs, the fixed-effects must be used. Accordingly, a critical supposition to choose the random-effects assessment is that unobserved heterogeneity must not be correlated for the independent variables.

The current research employed the Hausman assessment to inspect this supposition as well as to examine the suitability of indicating the random-effects estimate. The non-significant finding acquired from the Hausman check (χ^2 of 13.87, $p = 0.19$) indicates that the suppositions of the random-effects assessment are not contravened. Greene (2007) argued that the fixed-effects technique should be applicable to the cross-sectional companies in the examined sample, but that it may not be popularised external to the sample. Additionally, as the cross-sectional companies sample is drawn because of a sizable population, the individual specified consistent terms may be regarded as randomly distributed throughout the cross-sectional companies. The sample of this research is drawn from a sizable population, which contains 72 Jordanian listed companies over seven years; therefore, Greene's suggestion can be applicable. In those situations, this study employed the pooled random-effects GLS regression over a seven-year analysis period to investigate the proposed relationships. The statistical testing of the data was subsequently executed employing the STATA computer program.

The results of the random-effects GLS regression model of the total sample are shown in Table 5. The findings in this table indicate that the model is significant with a R^2 of 0.748. This finding is in accordance with other studies in comparable areas like Antle et al. (2006), DeBoskey and Jiang (2012), and Ghosh and Moon (2010). Furthermore, the lowest R^2 to be considered statistically significant

by six independent variables, with more than 400 sample observations, is 0.500 (Cohen & Cohen, 1983).

For the test of the relationship between the absolute value of discretionary accruals and auditor tenure, the results show that the coefficient is significant and negative. The result supports previous research (Gul et al., 2009; Lin & Hwang, 2010), and shows that longer auditor tenure is associated with lower absolute discretionary accruals, thus signifying higher FRQ. This result is consistent with *H1*. The analysis results presented in Table 3 show that the coefficient is significantly negative between the use of Big 4 auditors and earnings management, which is consistent with the expectation. This result suggests that companies hire Big 4 audit firms to report lower earnings management as compared to companies that hire non-Big 4 audit firms. This result is consistent with *H2* and previous studies (Francis & Yu, 2009; Lin & Hwang, 2010).

The findings presented in Table 5 also show that the coefficient for auditor specialist is also significantly negative, signifying that the negative relationship between auditor specialist and discretionary accruals is weak for client companies audited by industry specialists. This result is in line with previous literature (Habbash, 2010) and *H3*. The results relating to audit fees show that a larger audit fee is negatively and significantly associated with earnings management. Habbash (2010) found a similar result. *H4* is also supported. Moreover, this study analysis found that the non-audit fees coefficient is insignificant and negative; suggesting that the non-audit fees do not affect the discretionary accruals. This finding is contrary to this research expectation; hence, *H5* is not supported. Chung and Kallapur (2003) found a similar result.

During multivariate regression, this study employed a non-linear specification, which comprised debt as well as debt squared in identical regression. As soon as debt was comparatively low, the coefficient is negative and significant, indicating that management is less likely to manage earnings once the probability of violating the contract is not high. This result is in line with previous studies, such as Ahn and Choi (2009), and Ghosh and Moon (2010), and supports *H6*. However, at high debt, the coefficient is significantly positive. This result is consistent with prior studies (Ghosh & Moon, 2010; Klein, 2002), and suggests that at higher levels of debt the hazard of violating a covenant becomes very high, making it worthwhile for the company to diminish FRQ to avoid the covenant violation rather than to continue providing dependable opinions of the company's future forecasts. Based on this result, *H7* is supported.

The results on the corporate governance mechanism control variables show that board independence is significantly negatively associated with earnings management, which is in line with prior studies (Davidson et al., 2005). The result shows that the board financial expertise has a significant negative relation with discretionary accruals. Lin and Hwang (2010) reported a similar relationship. The result for the independence of the audit committee is negative and significantly related to the absolute value of discretionary accruals, which is similar to the findings of Piot and Janin (2007). The coefficient of audit committee financial expertise is significantly negatively related to earnings management, which is consistent with evidence in prior research, such as by Bédard et al. (2004).

With regard to insider ownership, the relationship is significantly and negatively associated with discretionary accruals. A negative relationship has been observed in many prior studies (Klein, 2002). The analysis shows that institutional ownership and foreign institutional investors have a significant and negative association with discretionary accruals. This finding is similar to Cornett et al. (2008) and Alzoubi (2016a, 2016b).

The results on firm characteristic control variables show that larger firms are negatively related to earnings management, which is consistent with prior literature (Ghosh & Moon, 2010). Firm growth is positively related to discretionary accruals in accordance with evidence uncovered by previous research (Gul et al., 2009). Similar to Gul et al. (2009), this study finding reveals that firm age is significantly negatively related to earnings management. Meanwhile, return on assets is negatively related to discretionary accruals. Habbash (2010) found similar results.

4.3. Robustness tests

The foremost supposition of the OLS regression is the homogeneity of the residual variance. There must be no pattern to the residuals plotted opposed to the fitting values if a model is tight-fitting. If the residual variance is not consistent, the variance of the residual is assumed to be heteroscedastic. For the sake of heteroscedasticity, the most popular approach is the Robust Standard Error (RSE). RSE reports an error problem that is not identical or independently distributed. Although the use of RSE does not convert the coefficient assessments produced through OLS, it will convert the significance analyses and standard errors. Thus, RSE OLS regression is reliable for measuring the incidence of heteroscedasticity.

In the sensitivity test, the parametric analysis employing RSE OLS with fixed-effects was implemented as a robust inspection of core results (Habbash, 2010). Table 5 displays that there are no variances among the chief tests adopting the non-parametric analysis as well as the parametric analysis for the findings. The R^2 reveals the same value; the findings reveal a similar significance level as well as that the coefficients present similar directions for the complete variables. The result shows that by employing various pertinent statistical procedures the results of this study can be considered robust.

Another sensitivity test employed in the current research was the pooled analysis. To examine the sensitivity of results a pooled analysis was applied, which presumes that all the observations occurred at the same time. This test employs pooled data at the company-level with fixed-effects specification, which is presumed to deal with the issue of endogeneity (Lehn, Patro, & Zhao, 2009). The rationale for fixed-effects (industry) is that the control of a fundamental economic environment could also influence the structure of corporate governance (Lehn et al., 2009). Table 5 shows that the results of this study are robust with the pooled data analysis. The R^2 is comparable; the findings display identical coefficients, and the significance levels indicate identical directions for all the variables, except for board independence, for which the level of significance dropped from 1% to 5%, as well as firm growth with the level of significance dropping from 1% to 5%.

Even though earnings management studies use single-equation regression models, limited contemporary studies have recommended that a simultaneous equations technique could be further applicable, as models encompassing governance mechanisms bear endogeneity (McKnight & Weir, 2009). The current research employed an instrumental variable two-stage regression (2SLS) technique test as well as the endogenous variables lagged values as instruments. In this test, all the variables were considered to be endogenous. The Hausman analysis was employed to examine if there is an endogeneity bias of the independent variables (Greene, 2007). The result of the Hausman analysis shows non-significant evidence of endogeneity bias at the level of 5% ($w^2 \frac{1}{4} 3.136$, $p = 0.21$), which has two imperative imputations. Firstly, comparable findings must be acquired employing either 2SLS or OLS. Secondly, the independent variables lagged are able to be used as instrumental variables as they permit Hausman analysis. Table 5 presents the 2SLS findings, which are consistent with the OLS findings documented previously. Accordingly, endogeneity does not appear to excessively impact the findings of this research.

Moreover, this study also investigated the influence of several discretionary accruals estimates (e.g., total accruals and current accruals) to derive the earnings management dependent variable. Utilizing these estimations provides findings that are largely qualitatively comparable. Finally, so as to control for the possible bias in the discretionary accruals estimation in the modified Jones model, this study used alternative accruals decomposition models; for example, the Jones model (1991), and DeFond and Park (2001). The results from the estimation of the modified Jones model depend on the alternate discretionary accruals valuation, which produce findings that are qualitatively similar to the findings presented in Table 5.

5. Summary and conclusion

This research tested the relationship between audit quality and debt financing, and earnings management in Jordan; a small capital market with governance features and distinctively institutional. This study generated the following contributions. Firstly, the research contributed to the literature by highlighting that the relationship between audit quality and debt financing, and earnings management, which are widely found in bigger markets, such as the US and UK, are actually embraced in a small market like Jordan. Secondly, the research adds to the scant literature on audit quality and debt financing through reporting associations between auditor tenure, size, specialist, and independence, as well as debt financing (low and high) on FRQ. Thirdly, the research has essential implications for pertinent regulatory bodies in Jordan, which might need to consider that modifications to the audit quality and debt financing are required, particularly high debt enforcement and guidelines. The findings indicate that audit quality (auditor tenure, size, specialist, and independence) and debt financing (low debt) diminish earnings management, and that certain features of both audit quality and debt financing may need to be enforced. Furthermore, future research should employ various measures of audit quality and debt maturity. This can also be applied to different countries with similar settings.

Regarding the corporate governance mechanisms, the results show that the governance mechanisms are efficient for reducing earnings management. Future research is required to determine the influence of different characteristics, such as board of directors, audit committees, and ownership structures, on earnings management after the introduction of the Jordanian Corporate Governance Code in 2009.

As for being a guide for another study, this research has possible limitations. The measurement error, which is critically problematic for earnings management research, is one such limitation. Therefore, this research is subject to all the limitations of the modified Jones model. As Jordanian companies do not publicly disclose the prevalence of modified audit opinion and financial restatements, this study is perhaps not comprehensive enough to employ empirical indicators like FRQ proxy. Finally, the findings of this study depend on a small sample that is not predictable for the setting of a small country. Nevertheless, as further audit quality and debt financing data become obtainable in Jordan, future studies can be reproduced for this research and include variables restricted through data unavailability.

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