Direct and mediated associations among earnings quality, book-tax differences and the audit quality

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Abstract

Purpose – The purpose of this paper is to investigate the direct and indirect links between book-tax differences (BTDs) and audit quality using accounting conservatism (proxy of earnings quality). Hence, this paper seeks to extend prior audit quality research.

Design/methodology/approach – This study uses a sample of Tunisian listed firms on the Tunis Stock Exchange and operating in the industrial and commercial sectors during 2005-2012. This investigation is motivated by structural equations system models that specify both a direct link and an indirect link that is mediated by information reflected in BTDs.

Findings – The results show that for the Tunisians companies, firms with large BTDs are associated with higher audit quality implies that such BTDs represent an observable proxy for earnings quality that affects auditor decisions. The authors find statistically an indirect link between abnormal BTDs and audit quality that is mediated by earnings quality. The current study also provides evidence that information reflected in BTDs can improve audit quality.

Practical implications – The findings may be of interest to the academic researchers, practitioners and regulators who are interested in discovering the informational value of BTDs in the audit process.

Originality/value – This paper extends the existing literature by examining the mediation effect of information reflected in BTDs on relationship between BTDs and audit quality.

Keywords Earnings quality, Audit quality, Abnormal book-tax differences, Book-tax differences

Paper type Research paper

1. Introduction

Book-tax differences (BTDs) play an important role in explaining the earnings quality in firms. BTDs and earnings quality have been studied by many researchers using different reasons. Previous studies have reported the importance of information on BTDs for investors (Lev and Nissim, 2004; Hanlon, 2005), analysts (Weber, 2009) and credit rating agencies (Ayers *et al.*, 2010). Recently, researchers have shown an increased interest in relationship between BTDs and auditor. Hanlon *et al.* (2006) investigate whether BTDs are associated with higher audit fees, more modified audit opinions, and greater auditor turnover. Recently, Hanlon *et al.* (2012) found that large BTDs explain higher audit fees implies that such differences indicate greater audit risk, complementing existing capital market and tax research. BTDs contain not only information about divergent reporting requirements for book and tax purposes but also information about opportunistic book and tax reporting.

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However, the question of whether abnormal book-tax differences (ABTDs) influence the auditor's decision has largely been unexplored. No previous study has investigated relationship between ABTDs and audit quality. According to Tang and Firth (2012), ABTDs reflect the differences that are more likely to be caused by earnings management and tax avoidance as well as their interaction. Tang and Firth (2012) show a negative and significant association between ABTDs and earnings persistence.

In the literature on BTDs, the relative importance of audit quality has been subject to considerable debate. Bell *et al.* (2001), Gul *et al.* (2003) link lower earnings quality or the risk of earnings management with higher audit risk and higher audit fees. The risk of earnings management is of increases the risk of misstatements or restatements, and thus, the inherent risk and the overall audit risk are higher (Krishnan and Visvanathan, 2008). Thus, the risk of earnings management allows auditor to spend more time and effort in auditing financial statements.

This paper will examine the existence and importance of both the direct link and the indirect link between ABTDs and audit quality. The major objective of this study was to investigate the mediating effect of earnings quality on the relationship between ABTDs and audit quality.

Data for this study were collected using a sample of Tunisian listed firms on the Tunis Stock Exchange (TSE) and operating in the industrial and commercial sectors during 2005-2012. Our investigation is motivated by structural equations system models that specify both a direct link and an indirect link that is mediated by information reflected in BTDs.

This study aims to contribute to this growing area of research by exploring the mediating effect of accounting conservatism (proxy of earnings quality) on the association between ABTDs and audit quality. The central question in this research paper asks how accounting conservatism (proxy of earnings quality) mediates association between ABTDs and audit quality.

This paper has been divided into seven sections. Section 2 is designed to describe accounting-tax system and audit regulation in Tunisia. Section 3 presents a theoretical framework of this current study. Section 4 is designed to develop hypotheses. Section 5 includes a description of BTDs, the study selected sample, variable measurement as well as the applied empirical tests. Section 6 presents the results' discussions and Section 7 concludes.

2. Accounting-tax system and audit regulation in Tunisia

2.1 Accounting and tax system in Tunisia

Accounting and taxation are two independent disciplines that serve different purposes. Accounting involves the preparation of information for the purposes of control and decision-making. It aims also at determining the principles and rules of assessment of taxable earnings. The main purpose of taxation is usually to raise revenue, but it is also used as an instrument of government economic and social policy. The adoption of Law No. 69-112 created a conceptual autonomy of accounting; accounting is a fully fledged legal branch (Ben Othman and Zéghal, 2006).

Accounting and taxation are two disciplines that, although independent, have an important common area. Tunisian corporate taxation has developed with close relation to financial reporting. In fact, the starting point in calculating the income tax is always the accounting income. Taxable income is determined on the basis of regular accounting results. When there are discrepancies between fiscal rules and accounting principles, adjustments are made to the accounting results. The fiscal balance sheet is only a table which includes the integrations and deductions of some items forced by tax law to calculate the taxable

income. Tunisian legislation gives companies a number of tax options and tax benefits (the investment incentive code of law No. 93-120 of December 27, 1993) such as the income reinvestment abatement. These incentives give to the manager the opportunity of tax optimization (Dridi and Boubaker, 2015).

The specificities of the Tunisian context are characterized by an accounting system that provides some flexibility in the choice of accounting policies and by a flexible tax legislation characterized by a tax benefits system offering a wide latitude in terms of tax management that creates a favorable ground for discretionary earnings and tax management practices, which creates discrepancies in earnings (Boumediene *et al.*, 2016).

2.2 Audit regulation in Tunisia

The auditor is defined as "the one who attests at his own responsibility, sincerity and regularity of accounts' company under the laws and regulations in force[1]". The auditor may be an individual or a corporation, is a professional invested with a legal task of accounts' certification in compliance with legal and regulatory provisions in force[2].

The auditor must intervene systematically and in limited companies that make or not public offering. He is likewise necessarily designated in the limited liability companies and other corporations subject to certain conditions set by the Tunisian code of commercial companies[3]. The same code provides for the mandatory appointment of auditor in all corporations regardless of their shape. In addition, the auditor is appointed by the general meeting and, in case of deficiency, through the courts for a term of three years renewable terms by tacit agreement. The appointing body can revoke the auditor before the expiration of their term unless it is established that he has committed a serious fault in the performance of their missions.

In Tunisia, as in Europe or the Anglo-Saxon countries, the external auditor incurs three types of liability, i.e. civil liability, criminal liability and disciplinary liability.

3. Theoretical framework

BTDs involves various aspects, mainly the motives for these differences, the potential conflicts of interest generated from the standpoint of agency theory and the quality of the information disclosed to the market. Jensen and Meckling (1976) define an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent. The literature on this theory showed that managers have major initiations to manipulate the book income and the tax income. These manipulations generate differences between book income and taxable income.

Taking the case of the agency relationship between the managers (the agent) and the tax authorities (the principal) that was biased by information asymmetry governing the relationship between these two stakeholders. The managers try to reduce tax expenses contrary to the tax administration that tries to maximize the public finances. This information asymmetry between managers and tax administration causes enormous agency costs. In this case, monitoring costs are supported by the tax authority when it implements the means of control to ensure the financial statements' reliability and limit thus the opportunistic behaviors' leaders. Also, the bonding expenditures by the agent try to ensure financial informations' quality. The introduction of external auditor as a "trusted guardian" will be important in particular to reduce those agency costs and ensure the financial informations' reliability. External audit is a governance mechanism that limits the monitoring costs. Their mission is to identify anomalies and intentional disconcordances and reveal them to the different stakeholders.

4. Literature review and hypotheses development

4.1 Link between book-tax differences and audit quality

In recent years, there has been an increasing amount of literature on the relation between BTDs and audit quality. Previous research has indicated that various BTDs indicators have a positive impact on audit quality. Hanlon *et al.* (2006) investigated an interesting point between auditing and tax research examining the association between BTDs, audit fees, modified audit opinions and auditor turnover. They indicated that BTDs reflect information that represents a higher risk of earnings management which increases auditors' efforts and time spent on the audit. Hanlon *et al.* (2012) found a positive relationship between BTDs and attributes of audit quality. They showed that large BTDs are associated with more modified audit opinions and a greater incidence of auditor turnover. Hanlon *et al.* (2006) interpret this evidence as being consistent with the BTDs reflecting information about possible earnings management and with auditors examining and using this information in auditing and opinion on the firms' financial statements. They reasoned thus their study by using previous research that links large BTDs with poor earnings quality, and argues that this link must show with auditors:

- to spend more time and efforts to audit companies' financial statements having large differences between their book income and taxable one;
- change their opinions frequently for companies having large BTDs; and
- to resign as often auditing for companies with large differences.

Hanlon *et al.* (2012) argue that large differences between book and taxable incomes are another indication that earnings quality is low which, in turn, affect audit risk. In fact, when the audit risk increases, the auditor tends to provide more effort to minimize this risk and give a reliable opinion on the regularity of financial statements. Empirically, these researchers found that there is a positive and significant relationship between BTDs and audit fees proxy of audit quality. Martinez and Lessa (2014) found a positive association between audit fees and the aggressiveness of tax avoidance which is measured by BTDs. Their results show that independent auditor consider the level of tax avoidance in pricing their service, indicating acceptance of the hypothesis which companies with more aggressive tax planning pay higher audit fees than those that are less tax aggressive:

H1. There is a positive relationship between BTDs and audit quality.

4.2 Link between book-tax differences and earnings quality

The link between BTDs and earnings quality was discussed and explained by several previous studies. In addition, Blaylock *et al.* (2012) have examined whether investors appear to use BTDs to help interpret the persistence of earnings and accruals. They found that large positive book-tax temporary differences arise predominantly as a result of earnings management, earnings and accruals persistence is significantly lower than in cases where either tax avoidance or fundamental firm characteristics are the primary source of large positive BTDs. Also, Hanlon (2005) found that firms with large temporary BTDs have lower pre-tax earnings persistence than firms with small temporary BTDs.

Prior studies argue that large BTDs reflect earnings management, which can also be reflected in large discretionary accruals. In addition, Tang and Firth (2012) have investigated whether the regulatory and opportunistic information impounded in BTDs deferentially influences earnings persistence and the earnings-returns relation. They found

that firms with large positive and negative ABTDs exhibit less earnings persistence compared to firms with small ABTDs.

Lev and Nissim (2004) have determined that firms with large BTDs have lower future after-tax earnings growth than firms with smaller differences. Guenther *et al.* (2013) investigated why large BTDs are associated with lower persistence of pre-tax financial accounting earnings. In fact, they have found that:

- earnings are less persistent for firms managing earnings regardless of the size of their BTDs; and
- large BTDs are related to persistence even after controlling for earnings management.

Also, prior research has linked BTDs to earnings management activity. Mills and Newberry (2001) present evidence that firms with earnings management incentives have greater differences between book and taxable income[4]. Also, Joos *et al.* (2000) have shown that large BTDs are associated with lower earnings response coefficients.

Several studies have proposed to measure the differences between the book income and the taxable one through deferred tax, dubbing them temporary differences. Yet, total differences include the entirety of components (temporary, permanent, normal and abnormal), involving vast information content regarding information quality. In this respect, Heltzer (2009) has examined, the usefulness of the BTDs' contained information to show the extent of conservatism prevailing in financial statements. In fact, she has shown that the relationship between BTDs and accounting conservatism depends highly on several factors. Indeed, she suggests that this relationship varies depending on the persistence of either large positive BTDs and/or negative ones. Firms with large positive BTDs tend to exhibit the same conditional and unconditional conservatism of financial statements and a higher level of conservatism in regard of taxable income as compared to other firms in the sample. In contrast, firms with large negative BTDs tend to display a higher conditional and unconditional conservatism on the book income and a lower conservatism level of taxable income in respect of other firms in the sample.

Based on the entirety of these cited findings, one may well predict that the BTDs' information content appears to help largely indicate the earnings quality (Jackson, 2015; Huang and Wang, 2013). Information on BTDs plays an important role in firm by helping different stakeholders to take the best decisions.

All these studies showed that BTDs have a negative impact on earnings quality regardless of their attributes.

H2. There is a negative relationship between BTDs and earnings quality.

4.3 The mediation effect of earnings quality

Our tests are investigating whether BTDs have a low quality of outcome indicator and if auditors use them in their audit process.

Several studies focus on the sources of the information reflected in BTDs, namely, tax management (Mills, 1998; Manzon and Plesko, 2002; Desai and Dharmapala, 2006). Other studies examine earnings management as a source of such differences between book and taxable incomes. Phillips *et al.* (2003) indicate a relation between book and tax reporting and firms' incentives to engage in earnings management activities (Mills and Newberry, 2001). They documented that firms with earnings management incentives have greater BTDs. In

the same way, Lev and Nissim (2002) and Hanlon (2005) provide evidence that large BTDs are associated with lower earnings quality.

Revsine *et al.* (2005) state that a widening BTDs represent a potential danger signal that should be investigated, because it might be an indication of deteriorating earnings quality. This allows us to show the importance of the information contained in BTDs. Hanlon *et al.* (2006) investigate both whether BTDs are a proxy for low earnings quality and whether auditors use proxies for earnings quality in conducting audits. They state that If auditors use the information reflected in BTDs in assessing earnings quality then large BTDs should indicate the necessity for auditors to exert more effort so a high audit quality. Also, in their studies, Hanlon *et al.* (2006) explained the relation between large BTDs and audit opinions. They said that if auditors utilize the information reflected in BTDs to assess earnings quality and then communicate this to the market, we would expect to see a positive relation between the absolute value of BTDs and modified audit opinions.

In fact, hypothesis, which large BTDs can indicate earnings quality problems, allows Hanlon *et al.* (2012) to derive a positive and significant association between temporary BTDs and different attributes' audit quality. They interpret this as evidence consistent with larger BTDs reflecting information that represents a higher risk of earnings management, a low earnings quality causing auditors to spend more time on the audit.

In short, the above discussion indicates that BTDs affects negatively earnings quality (measured by accounting conservatism) which in turn affects positively audit quality. This argument is presented in Figure 1: the effect of BTDs on audit quality (relation c') through a role of earnings quality "mediation" [relation (a × b)]. The relation (c) represents the direct effect of BTDs on audit quality. The mediating variables' role generates a decomposition of the total effect (c) of the independent variable (X: BTDs) on the dependent variable (Y: audit quality) into a direct effect (c') and an indirect effect (ab).

H3. Earnings quality mediates relationship between BTDs and audit quality.

According to Figure 1, the mediating effect exists when both variations' level of the dependent variable influences significant variations in the mediating variable (a), and variations' level thereof affect significantly the dependent variable (b).

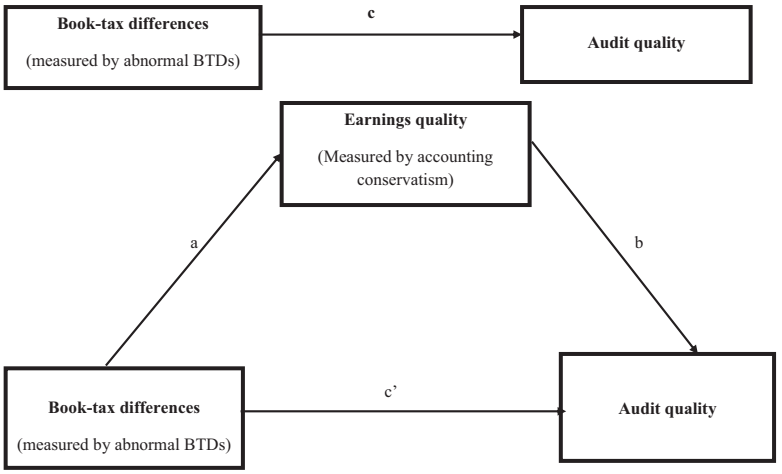

Figure 1.
Relationship between ABTDs, accounting conservatism and audit quality

5. Research methodology, sample description and empirical measures

5.1 Research methodology

The aim of this study is essential to investigate the mediating effect of earnings quality on the relationship between BTDs and audit quality. To test hypothesis of mediation, we adopt two approaches. The first is provided by Baron and Kenny (1986), Kenny *et al.* (1998). The second is a test of Sobel (1982) would be a more statistically rigorous method to test mediation (Preacher and Hayes, 2004).

Baron and Kenny (1986) define a mediator as a variable to the extent that it accounts for the relation between the independent variable and the outcome variable. They have discussed four steps in establishing mediation:

> *Step 1*: Show that the initial variable is correlated with the outcome (Model Y =X).
>
> *Step 2*: Show that the initial variable is correlated with the mediator (Model M = X).
>
> *Step 3*: Show that the mediator affects the outcome variable (Model Y = M X).
>
> *Step 4*: To establish that M completely mediates the X–Y relationship, the effect of X (IV) on Y (DV) controlling for M should be zero (estimate and test path c'). The effects in both Steps 3 and 4 are estimated with the same regression equation.

If all four of these steps are met, then the data are consistent with the hypothesis that variable M completely mediates the X–Y relationship, and if the first three steps are met but the Step 4 is not, then partial mediation is indicated. Sobel's (1982) test of significance is performed to determine the extent to which a mediator contributed to the total effect on the outcome variable.

In our case, the variables X, M and Y are as follows:

- X: ABTDs;
- M: earnings quality; and
- Y: audit quality.

Econometrically, we estimate Models 1-3 testing the direct and indirect relationship between discretionary BTDs and audit quality:

$$AUDQ_{it} = \beta_0 + \beta_1 ABTDs_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (1)$$

$$C - Score_{it} = \beta_0 + \beta_1 ABTDs_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 \Delta REV_{it} + \varepsilon_{it} \quad (2)$$

$$AUDQ_{it} = \beta_0 + \beta_1 ABTDs_{it} + \beta_2 C - Score_{it} + \varepsilon_{it} \quad (3)$$

Regression analysis was used to predict the direct and indirect links between BTDs and the audit quality. We use the structural equation modeling (SEM) with Stata 12 to analyze structural equations. This method has two advantages, namely, the models taking account with multiple dependent variables over the specification of the relationship between these variables. Thus, an independent variable can affect a dependent variable directly and/or indirectly via another mediating variable. Also, the SEM technique allows the inclusion of measurement errors in both dependent and independent variables.

5.2 Sample description

In Table I, we present the composition of our sample firms as well as in Table II the industry composition of all firms during our sample period. The sample of this study includes Tunisian firms that are listed on the TSE during eight years ranging from 2005 to 2012. The initial obtained sample contains 77 Tunisian-listed firms. A small sample was chosen because of the expected difficulty of obtaining a favorable framework to study the relation between BTDs and audit quality and by the choice of study variables (including earnings quality). From the initial sample, we have eliminated first the financial firms. This exclusion is justified by the fact that they are governed by a special legislation in the preparation of their financial statements and by specific sector accounting standards.

Second, we have chosen to remove firms with missing necessary data to work on a balanced panel. Hence, 28 firms and 224 observations remain in our sample.

Data for this study were retrospectively collected from published financial statements on the TSE and Financial Market Council.

5.3 Empirical measures

5.3.1 Dependent variable: audit quality. Audit quality is not a new concept in the audit area. However, until now, it does not always universal definition that researchers can agree unanimously. By examining recent studies issued by the regulatory bodies of research on audit quality, we classify the different terms defining the audit quality in two major categories of direct and indirect definition. Previous studies have measured audit quality based on criteria that determine the quality perceived by the market as audit firm size, audit fees, reputation, specialization and audit adjustment (Chadegani, 2011; DeAngelo, 1981;

Table I.
Sample selection

Sample	No. of firms
Initial sample	77
Financial firms	(47)
Firms with insufficient data	(2)
Final sample	28
Duration of study	8
Total observations	224

Table II.
Distribution of the sample according to sectors' type

Sector	Observations
Industrial sector	
Agro-food industry	32
Construction material	48
Chemicals	40
Various industries	16
Total industrial firms	136
Commercial sector	
Total commercial firms	32
Service sector	
Total service firms	56
Total observations	224

Becker *et al.*, 1998; Francis, 2004; Deis and Giroux, 1992; Ghosh and Moon, 2005). For this study, we chose to use the method adopted by Lajmi and Gana (2011) for measuring audit quality. Indeed, they proposed a new measure taking into account four proxies of audit quality and calculated an index called index audit quality. In a more precise way, four attributes are using, i.e. big 4, co-statutory auditors, big 4/co-statutory auditors and audit fees. In addition, index of audit quality is calculated by simple summation of the notes obtained at each of the companies. The index calculated is based on the addition and the approach of non-weighting of items. This approach to additive and unweighted scoring was used and validated by several studies (Eng and Mak, 2003). In our case, we follow the same approach as these authors but based on eight attributes. The selection of these attributes is explained by the availability of information in the Tunisian context. The selected attributes are presented in the following Table III:

where: Audit quality index = number of attributes for the company i/total attributes (eight attributes).

5.3.1.1 Auditor size. Auditor size is used to proxy for audit quality because large auditors are expected to have stronger incentives and greater competencies to provide high audit quality (DeAngelo, 1981). Following DeAngelo's study, many other studies empirically examine and confirm that firm size is closely associated with audit quality (Krishnan and Schauer, 2000; Al-Ajmi, 2009; Lawrence *et al.*, 2011). Big N auditors are thought to be more independent than smaller audit firms because they:

(1) suffer greater reputational risk should they be negligent;

(2) rely less on an individual client's revenues and hence less likely to be swayed by an individual client; and

(3) their larger revenue base exposes them to higher litigation risk (Skinner and Srinivasan, 2012; Koh *et al.*, 2013; DeFond and Zhang, 2014).

Attributes	Symbols	Measures
Auditor size	BIG	A dummy variable coded 1 if the firm is audited by Big 4 auditor and 0 otherwise
Co-statutory	COS	A dummy variable coded 1 if the firm is audited more by another auditor (non Big4) and 0 otherwise
Audit opinion	AUDOPIN	A dummy variable coded 1 if the firm receives a modified audit opinion and 0 otherwise
Audit lag	AUDLAG	This variable can be defined as a number of days from fiscal year end of the date of the audit report
Audit specialization	AUDSPEC	A binary variable coded 1 if the author is a specialist and 0 otherwise
Auditor size and Co-statutory	BIG and COC	A dummy variable coded 1 if the firm is audited more by Big 4/co-statutory auditor and 0 otherwise
Audit tenure	AUDTEN	A binary variable coded 1 if there was a rotation after three years, 0 otherwise
Experience	EXP	A binary variable coded 1 if it is in the audit for at least three years and 0 otherwise

Table III.
Selected attributes

5.3.1.2 Co-statutory auditors. On the first point, the existence of two external auditors would confront opinions and to give greater weight to the audit opinion (Guedas, 2007). Moreover, the presence of two additional professional seems to provide better expertise due to own diverse skills each cabinet. The co-statutory auditors seem thereby enrich the judgment of auditors and give more quality to the opinion emitted. On the second point, the use of co-statutory auditors allow to sit a theoretical component of the audit quality, namely, auditor's independence (DeAngelo, 1981). The independence is strengthening because collusion between managers and auditors becomes less easy when the company is faced with two auditors (Piot and Schatt, 2010). The likelihood that irregularities are revealed is mechanically increased.

5.3.1.3 Auditor specialization. Krishnan (2003) considers that industry specialization auditors are to be another proxy for audit quality. The expertise of the auditor plays an important role in improving audit quality (Hussein and Hanefah, 2013). It is expected that specialists would provide high-quality services. Moreover, Krishnan (2003) suggested that auditors with skills and expertise are associated with less earnings management. Industry leaders have greater expertise, resources and market-based incentives that enable them to detect irregularities and misrepresentations more easily (Kanagaretnam *et al.*, 2010).

The specialization of the auditor may be a good attribute to measure audit quality because the audit quality is positively related to specialization and industry expertise (Lowensohn *et al.*, 2007).

5.3.1.4 Audit tenure. Several researchers have shown a relationship between audit tenure and audit quality (Jackson *et al.*, 2008; Chi *et al.*, 2012). In fact, the nature of this relationship is not perfect for all researchers. Cameran *et al.* (2016) suggested that long auditor tenure may cause a relationship to be established between the auditor and the issuer, which in turn possibly may compromise the auditor's independence and objectivity. The relationship that existed between Enron and Anderson is the best example to prove the importance of audit tenure (Arel *et al.*, 2005). In contrast, other literature on auditor tenure has concluded that long auditor tenure does not impair audit quality. The argument against mandatory audit firm rotation is that new auditors lack client specific information which could lead to increases in audit failures (Myers *et al.*, 2003). This would decrease the audit quality.

5.3.1.5 Audit opinion. The auditor's opinion is the most important part of the audit report as it summarizes the findings of their mission. If auditors show that company financial statements contain a material misstatement and are not in accordance with generally accepted accounting principles (GAAP), they are then forced to change their opinion and give an opinion with reserve. In theory, the probability for the auditor to give a modified opinion is low when the independence of the auditors is impaired DeAngelo (1981).

5.3.1.6 Audit lag. The audit lag indirectly used to measure audit quality (Knechel and Payne, 2001; Payne and Jensen, 2002; Knechel and Sharma, 2012). The rapidity with which the audit opinion and the financial statements are revealed to the public is an important element of capital markets' efficiency.

5.3.2 Independent variable: abnormal book-tax differences. Manzon and Plesko (2002) conducted an investigation of the major differences noticeable between book income and the taxable income. Actually, they identify four activity types likely to affect book-tax income spread, namely:

(1) demand controls for tax favored investment and financing action;

(2) direct investment sources' related timing differences;

(3) permanent differences; and

(4) noise factors.

Graham *et al.* (2012) found that the determinants of BTDs include tax planning, earnings management, general business conditions, changes in financial accounting rules, changes in firm-level sales and the level of property, plant and equipment in a given firm. In this study, we adopt the approach developed by Tang and Firth (2011) and isolate the BTD information related to regulatory differences and the BTD information related to opportunistic differences. They regress total BTDs on non discretionary items that are known to cause NBTDs but are less likely to reflect earnings or tax manipulations. These items are changes in sales, gross property, plant and equipment, non-goodwill, intangible assets, net operating loss and tax rate differences.

In this study, we use factors related to differences in Tunisian tax and accounting rules to explain non discretionary differences. We regress total BTDs in factors of changes in sales, gross property, plant and equipment, profitability and lagged BTDs.

The estimation equation is:

$$\boldsymbol{BTDs_{it}} = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1 \Delta \boldsymbol{REV}_{\boldsymbol{it}} + \boldsymbol{\beta}_2 \boldsymbol{PROF}_{\boldsymbol{it}} + \boldsymbol{\beta}_3 \Delta \mathbf{INV}_{\boldsymbol{it}} + \boldsymbol{\beta}_4 \boldsymbol{LagBTD}_{\boldsymbol{it}} + \boldsymbol{\varepsilon}_{\boldsymbol{it}} \quad (4)$$

Where BTDit: total BTDs for the firm i in year t obtained from the difference between pretax book income and taxable income; ΔREVit: the change in revenue from year t-1 to year t; Δ INVit: the change in investment in gross property, plant and equipment from year t-1 to year t; PROFit: is a binary variable equal to one if the firm reports positive pre-tax income and zero otherwise and LagBTDs: reported BTDs in year t-1.

To control for firm size, all variables are scaled by average total assets at year t except for PROF. NBTDs are the fitted values from equations (4) and the residuals are ABTDs.

5.3.3 Mediating variable: earnings quality. We measure earning quality by using a proxy of accounting conservatism. Accounting conservatism was measured according to the procedure used by Khan and Watts (2009). The model of Basu (1997) can be written as:

$$\boldsymbol{X}_{\boldsymbol{i},\boldsymbol{t}} / \boldsymbol{P}_{\boldsymbol{i},\boldsymbol{t}-1} = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1 [\boldsymbol{D}_{\boldsymbol{it}}] + \boldsymbol{\beta}_2 [R_{it}] + \boldsymbol{\beta}_3 [\boldsymbol{R}_{\boldsymbol{it}} \boldsymbol{D}_{\boldsymbol{it}}] + \boldsymbol{\varepsilon}_{\boldsymbol{i},\boldsymbol{t}} \quad (5)$$

where $X_{i,t}$ is the earnings per share for firm i in fiscal year t, $P_{i,t-1}$ is the price per share at the beginning of the fiscal year, R_{it} is the return on the firm i over the period 9 months before the fiscal year-end t to three months after fiscal year-end t, D_{it} is a dummy variable equal to 1 when Rit < 0 and equal to 0 otherwise and $\varepsilon_{i,t}$ is the residual. The good news timeliness measure is $\beta 2$. The measure of incremental timeliness for bad news over good news, or conservatism, is $\beta 3$ and the total bad news timeliness is $\beta 2 + \beta 3$.

Watts (2003) suggests that conservatism varies with four factors: contracts (including debt and compensation contracts), litigation, taxation and regulation. Previous research (Watts, 2003; Guay, 2008; Zhang, 2008; Gao, 2013) has documented the role of debt covenants and conservative financial accounting in addressing agency conflicts between lenders and borrowers.

Khan and Watts (2009) introduced in the Basu model the following variables: the market-to-book ratio, firm size and firm leverage to generate C-Score, which estimates the level of conservatism. Khan and Watts (2009) find that conservatism is a linear function of the Market-to-Book Ratio, size and leverage. The specifications of C−Score are:

$$\mathbf{C-SCORE_{it}} = \beta 3 = \lambda 0 + \lambda 1 (\mathbf{SIZE})_{\mathbf{it}} + \lambda 2 (\mathbf{M/B})_{\mathrm{it}} + \lambda 3 (\mathbf{LEV})_{\mathrm{it}} \quad (6)$$

Where SIZE: stands for the natural log of equity market value; M/B: represents the market-to-book ratio and LEV: is leverage, defined as long-term and short-term debt, deflated by equity market value.

Replacing β_3 in equation (5) by equation (6) yields the following empirical regression model:

$$\begin{aligned} X_{i,t}/P_{i,t-1} = {} & \beta_0 + \beta_1 D_{i,t} + R_{i,t}(\mu 1 + \mu 2 SIZE_{it} + \mu 3 MTB_{it} + \mu 4 LEV_{it}) \\ & + D_{it} R_{i,t}(\lambda_0 + \lambda_1 SIZE_{i,t} + \lambda_2 MTB_{i,t} + \lambda_3 LEV_{i,t}) + (\delta 1 SIZE_{it} \\ & + \delta 2 MTB_{it} + \delta 3 LEV_{it} + \delta 4 D_{it} SIZE_{it} + \delta 5 D_{it} MTB_{it} \\ & + \delta 6 D_{it} LEV_{it}) + \varepsilon_{i,t} \end{aligned} \quad (7)$$

To estimate the level of conservatism concerning each company, we adopt the following approach Gao (2013), Francis *et al.* (2013), André *et al.* (2014): we begin by estimating λ_i, i = 0 to 3 in the equation (7), then we introduce the estimated parameters in the equation (6) of C-Score. We interpret a higher value of $C\text{-}Score_{it}$ as accounting information with a higher level of conservatism.

5.3.4 Control variables. We add other variables in the regression [equation (1)] to control for size, leverage and performance.

5.3.4.1 Firm size. Several previous studies have focused on the relationship between firm size and audit quality. According to DeFond (1992), firm size explains significantly the choice an auditor big. Piot (2004) showed that is a positive and significant relationship between firm size and audit fees. Thus, according to the audit approach, Simunic (1980) exhibited that a company which contains many assets, inventories and receivables demands more diligence of auditor. We expect a positive association between firm size and audit quality.

5.3.4.2 Leverage. The recourse to debt establishes a link between shareholders and creditors. The risk for creditors is that shareholders take advantage of their management autonomy to make transfers of wealth to their detriment. In this case to ensure the credibility of financial information, the designation of qualified professional is important. However, Simunic and Stein (1987) have shown a negative association between leverage and audit quality. But Lee *et al.* (2003) and Hay and Davis (2004) support the predictions of agency theory, such as a high level of debt of the firm increase the probability of the demand for better audit quality to reduce agency costs. We suppose a positive association between leverage and audit quality.

5.3.4.3 Performance. Skinner and Srinivasan (2012) have shown a positive association between performance and audit fees proxy of audit quality. Also, Lajmi and Gana (2011) found a significant positive association between performance and audit quality index. There is a positive relationship between performance and quality audit.

We also add other variables in the regression [equation (2)] to control for performance, size, sales growth and leverage. Previous studies suggest a negative association between performance (ROA) and accounting conservatism. Ahmed *et al.* (2002) argue that the mechanical, negative association between accounting conservatism and ROA dominates the positive association between accounting conservatism and profitability. We expect a negative relationship between ROA and accounting conservatism. Khan and Watts (2009) suggest that small firms exhibit high accounting conservatism level than large firms. Also, Watts and Zimmerman (1986) propose that large firms have high political costs, resulting in high accounting conservatism. In this case, we expect a positive relationship between firm size and accounting conservatism.

We include also leverage to control for the effect of bondholder-shareholder conflicts over dividend policy on accounting conservatism (Ahmed *et al.*, 2002). We expect a positive association between leverage and accounting conservatism.

According to Ahmed *et al.* (2002), sales growth is likely to affect conservatism for the following reasons. Sales growth is likely to influence positively accruals and negatively conservatism.

Table IV shows the exogenous, endogenous and control variables' measurements.

6. Analysis and results' discussion

6.1 Descriptive statistics

Table V shows the summary statistics for the dependent variable, the independent variable and the mediating variable.

Table V provides summary statistics for accounting conservatism, audit quality and ABTDs.

With regard to our main conservatism measure, *C-score*, we find that the mean value is 2.610, and the median value is 2.481. Our results are higher than those of Khan and Watts (2009) (mean = 0.105 and median = 0.097). Two reasons are possible. The first is relative to difference between contexts. Second, our *C-score* is only for 2005-2012, but Khan and Watts measure *C-score* from 1963 to 2005. Francis *et al.* (2013) found also that results of the *C-score* are higher than those of Khan and Watts (2009), and the value is much closer to that of Khan and Watts (2009).

Variables	Symbols	Measures	Authors
Dependent variable			
Audit quality	AUDQ	Number of attributes for the company i/total Mediating variable	Lajmi and Gana (2011) attributes (eight attributes)
Accounting conservatism	C-score	The level of conservatism of the firm i in year t measured by the model of Khan and Watts (2009)	Khan and Watts (2009), Gao (2013), Francis *et al.*, (2013), Jarboui (2013), André *et al.*, (2014)
Independent variables			
ABTDs	ABTDs	The residual estimated from equation (4) (The difference between BTDs and NBTDs)	Tang and Firth (2012)
Control variables			
Returns on asset	ROA	The ratio of earnings per share to total assets	Khan and Watts (2009)
Size	SIZE	Ln (total assets)	Khan and Watts, (2009), Watts and Zimmerman, (1986)
Leverage	LEV	Total debts/total assets	Ahmed *et al.*, (2002), Dichev and Skinner, (2002), DeFond and Jiambalvo, (1994), Zmijewski and Hagerman (1981)
Growth opportunities	ΔREV	Calculated in terms of current year net sales, as reported on the income statement, minus the previous year net sales	Ahmed *et al.* (2002)

Table IV.
Statutory variables definitions and measurements

The average ABTDs level is 0.4 per cent with minimum ABTDs of −13 per cent and a maximum of 11.6 per cent. The discrepancy between the minimum and maximum values is considerably high, denoting large heterogeneity in the firms' reporting gap.

The analysis of control variables shows that leverage (LEV) owns on average 50.2 per cent in the capital of Tunisian firms. It reveals that most Tunisian listed companies have a high level of debt. Performance (ROA) attains an average rate of 5.6 per cent of total assets. Our firms have a mean (median) value for size (Ln of assets) of 17.959 (18.112).

6.2 Results of structural equation model

6.2.1 Step 1: check the relationship between abnormal book-tax differences and audit quality. Step 1 is to show a significant relationship between ABTDs and audit quality:

$$\boldsymbol{AUDQ_{it} = \beta_0 + \beta_1 ABTDs_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \varepsilon_{it}} \quad (1)$$

The results of the correlation analysis are presented in Table VI.

Further analysis showed that there is no problem of multicolinearity because VIF is less than 2. We show, also, the existence a relationship between audit quality index and discretionary differences. This leads us to infer a primary significant relationship between the two variables.

It was hypothesized that a positive association between ABTDs and audit quality. Table VII presents the results of estimating equation (1) to test our *H1*. As predicted, large

Variables	Mean	Minimum	Maximum	Standard deviation	Median
AUDQ	0.431	0.125	0.875	0.228	0.375
ABTDs	0.0004	−0.130	0.116	0.041	−0.002
C-score	2.610	2.134	5.283	0.483	2.481
SIZE	18.112	15.489	21.197	1.008	17.959
LEV	0.502	0.081	0.977	0.200	0.524
ROA	0.056	−0.316	0.179	0.067	0.055

Table V.
Descriptive statistics

Correlation matrix	AUDQ	ABTDs	LEV	SIZE	ROA	VIF
AUDQ	1					
ABTDs	0.100	1				1.19
	0.133					
LEV	0.064	−0.205	1			1.44
	0.334	0.002***				
SIZE	0.179	−0.068	0.427	1		1.24
	0.007***	0.304	0.000***			
ROA	−0.002	0.342	−0.389	−0.028	1	1.37
	0.970	0.000***	0.000***	0.668		

Table VI.
Correlation matrix

Notes: AUDQ: audit quality index; ABTDs ABTDs residual estimated from equation (4); ROA is the ratio of earnings per share to total assets; SIZE is calculated as a logarithm of total assets; LEV is calculated as the ratio of total debt to total assets; *** denote significant differences from zero at 0.01 levels

ABTDs are positively associated with higher audit quality ($\beta 1 = 0.073$, significant at less than 0.01).

The findings of the current study are consistent with those of Hanlon *et al.* (2012) who found that large BTDs are positively associated with higher audit fees. We know that audit fees represent a proxy of audit quality. We interpret this as evidence consistent with large ABTDs reflecting information that represents a higher risk of earnings management, causing auditors to spend more time and effort on the audit.

In accordance with the present results, previous studies have demonstrated that a positive relationship exists between BTDs and audit fees, audit adjustment and audit opinion changed (Mills, 1998; Hanlon *et al.*, 2006; Hanlon *et al.*, 2012). External auditor provides more effort into firms with large BTDs.

This result may be explained by the fact that ABTDs are more likely driven by earnings and tax management activities (Tang and Firth, 2012). Then, the auditor uses information transmitted by ABTDs and spend more effort on the audit for reducing earnings management.

The results, as shown in Table VII, indicate that a positive and significant relationship between size (SIZE), leverage (LEV) and audit quality ($\beta 2 = 0.035$; $\beta 3 = 0.002$) at the level of 5 and 1 per cent. In summary, these results show that when firms with high leverage need the request of higher audit quality (Piot, 2003, 2005; Velury *et al.*, 2003). The size significantly explains the choice of an auditor belonging to an international network (Defond, 1992).

A positive correlation was found between performance (ROA) and audit quality. This result is significant at the $p = 0.026$ levels.

Then we check the first condition for the approach of Baron and Kenny (1986) and there is a positive and significant correlation (coefficient c) confirming *H1*.

6.2.2 Step 2: check the relationship between abnormal book-tax differences and accounting conservatism. Step 1 is to show a significant relationship between ABTDs and audit quality:

$$C - Score_{it} = \beta_0 + \beta_1 ABTDs_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 \Delta REV_{it} + \varepsilon_{it} \quad (2)$$

Variables	Step 1 (equation 1) Coefficient	Z	P > |z|
ABTDs	0.492	1.79	0.073*
SIZE	0.025	2.11	0.035**
LEV	0.192	3.08	0.002***
ROA	0.392	2.22	0.026**
Wald $chi^2(4)$		25.82	
Prob > chi^2		(0.000)***	

Notes: AUDQ: audit quality index; ABTDs ABTDs residual estimated from equation (4); ROA is the ratio of earnings per share to total assets; SIZE is calculated as a logarithm of total assets; LEV is calculated as the ratio of total debt to total assets; *, ** and *** denote significant differences from zero at 0.10, 0.05 and 0.01 levels, respectively

Table VII. Results' regression of the relationship between ABTDs and audit quality

Table VIII shows Spearman correlations between main variables used in our analysis. As expected, we find that ABTDs are significantly negatively correlated with the C-score.
We test for multicollinearity in the regressions by calculating variance inflation factors and condition indices. All of the VIFs are under 2, suggesting that multicollinearity does not appear to be a potential problem.

It was hypothesized that a positive association between ABTDs and audit quality. Table IX presents the results of estimating equation (2) to test our *H2*.

With respect to equation (2), Table IX shows that ABTDs affect negatively and significantly ($\alpha = -0.835$, $p = 0.014$) accounting conservatism. This result indicates that firms with large ABTDs are associated with lower accounting conservatism.

This finding supports previous studies which link ABTDs and earnings quality (Huang and Wang, 2013; Tang and Firth, 2012; Blaylock *et al.*, 2012; Hanlon, 2005). Huang and Wang (2013) found that firms with large temporary differences are associated with lower

Correlation matrix	C-score	ABTDs	SIZE	LEV	ROA	ΔREV	VIF
C-score	1						
ABTDs	−0.125	1					*1.21*
	0.062*						
ROA	−0.028	0.360	1				*1.51*
	0.673	0.000***					
ΔREV	0.042	0.105	0.205	1			*1.13*
	0.525	0.116	0.002***				
LEV	0.520	−0.213	−0.407	0.214	1		*1.67*
	0.000***	0.001***	0.000***	0.01***			
SIZE	0.743	−0.046	−0.046	0.084	0.442	1	*1.27*
	0.000***	0.490	0.493	0.208	0.000***		

Notes: C-score$_{it}$ designates the conservatism level of the firm i in year t; ABTDs ABTDs residual estimated from equation (4); ROA is the ratio of earnings per share to total assets; SIZE is calculated as a natural logarithm of total assets (without natural just as a logarithm); LEV is calculated as the ratio of total debt to total assets; ΔREV is calculated in terms of current year net sales, as reported on the income statement, minus the previous year net sales; * and *** denote significant differences from zero at 0.10 and 0.01 levels, respectively

Table VIII.
Correlation matrix

		Step 2 (equation 2)	
Variables	Coefficient	z	P > |z|
ABTDs	−0.835	−2.46	0.014**
SIZE	0.161	10.88	0.000***
LEV	0.371	4.95	0.000***
ROA	0.203	2.22	0.404
ΔREV	−0.076	−1.12	0.262
Wald chi^2(4)		205.73	
Prob > chi^2		(0.000)***	

Note: C-Score$_{it}$ (dependent variable) designates the conservatism level of firm i in year t; ABTDs ABTDs residual estimated from equation (4); ROA is the ratio of earnings per share to total assets; SIZE is calculated as a logarithm of total assets; LEV is calculated as the ratio of total debt to total assets; ΔREV is calculated in terms of current year net sales, as reported on the income statement, minus the previous year net sales; ** and *** denote significant differences from zero at 0.10 and 0.01 levels, respectively

Table IX.
Results' regression of the relationship between ABTDs and accounting conservatism

earnings persistence. In fact, whenever ABTDs increase, accounting conservatism tends to decrease, and subsequently, information asymmetry and earnings management would seem to increase. The findings of the current study are consistent with those of Tang and Firth (2012) who found that firms with large positive and negative ABTDs exhibit less earnings persistence compared to firms with small ABTDs.

This result may be explained by the fact that firms that engage in more earnings management and tax management exhibit less accounting conservatism level. There are, however, other possible explanations. Our context is characterized by an accounting system which offers maneuver for managers in the choice of accounting policies and a tax system that gives wide latitude in tax management. So, this negative correlation is explained by the existence of accounting manipulations which result lower accounting conservatism.

As for the control variables, Table IX shows that (SIZE) has a positive and significant effect on accounting conservatism. In fact, the large firms are assumed to be more conservative than small firms. The findings of the current study are consistent with those of (Lafond and Watts, 2008; Khan and Watts, 2009) who, affirming that according to the political costs hypothesis; large firms usually tend to implement accounting conservatism to a higher level than small firms. Table VIII indicates that (LEV) has a positive and significant effect on accounting conservatism. This result corroborates with Khan and Watts (2009) who established the existence of a positive association between leverage and accounting conservatism.

The results, as shown in Table IX, indicate that (ROA) has a positive effect on accounting conservatism. This result is significant at the $p = 0.01$ levels. There was a negative correlation between growth (ΔREV) and accounting conservatism. The results of this study indicate that growth firms are more susceptible having less informative accounting information. Similarly, Ahmed *et al.* (2002) found that growth opportunities affects negatively accounting conservatism because sales growth may positively affect either accruals or the market's expectation of future growth reflected in accounting conservatism (Sun and Liu, 2011).

6.2.3 Step 3: check the mediating effect of earnings quality on the relationship between abnormal book-tax differences and audit quality. We use in this step the SEM. This method allows us to check Steps 2 and 3 at the same time. In fact, Step 2 is to find a significant relationship (coefficient a) between the independent variable (ABTDs) and the mediating variable (C-score). Contrary, Step 3 is to test the relationship between ABTDs and audit quality to adding the mediator variable, namely, earnings quality.

Step 3 in testing for the mediating effect needs to evaluate the original direct effect (c) and (c') as illustrated in Figure 1. The results, as shown in Table X, indicate that a negative and significant relationship between ABTDs and mediating variable (accounting conservatism). This result is significant at the $p = 0.000$ level. There was also a significant positive correlation between audit quality and accounting conservatism proxy of earnings quality ($p = 0.049$).

The result indicates that the independent variable (ABTDs) is significantly related to the dependent variable (AUDQ). However, the standardized coefficient of ABTDs is changed from 0.073 to 0.004, indicating that the effect of the independent variable (ABTDs) on the dependent variable (AUDQ) is mediated partially. Therefore, the *H3* is supported.

6.2.4 Step 4: check the mediated nature. The Sobel test is a method of testing the significance of a mediation effect. The last step in the process of Baron and Kenny, (1986) is to verify the partial or total nature of mediation in examining the significance of direct links between ABTDs and audit quality.

Table XI below shows that the link between ABTDs and audit quality remains significantly after the introduction of the mediating variable that the first step in the process of Baron and Kenny ($\beta = 1.126$; $p = 0.004$). Then, mediation by the earnings quality is partial. It must also ensure the significance of the mediating effect using the Sobel test. However, Kenny *et al.* (1998) recommend the use of Sobel test (1982) to calculate the standard error of the indirect effect. If this test determines the presence of indirect effects, Preacher and Hayes (2004) recall that the first condition of the test of Baron and Kenny (1986) must be completed to conclude mediation. The results' test indicate that the mediating effect of earnings quality is statistically significant for the links between ABTDs and audit quality ($p = 0.06$).

6.2.5 Discussion findings. The purpose of the study is to explore the mediating effect of accounting conservatism on the relationship between ABTDs and audit quality. Our findings have implications both for theory and for practice and they provide support for the inclusion of accounting conservatism. We have contributed to the debate about ABTDs and audit quality by investigating how accounting conservatism affects the relationship between ABTDs and audit quality. Extant research rarely investigated the mediating role of accounting conservatism on audit quality.

Consistent with our prediction, the findings of the study indicate that there is a positive relationship between ABTDs and audit quality. The evidence is in congruence with the agency theory, indicating that ABTDs is associated with audit quality positively. However, with the introduction of accounting conservatism (mediator variable and proxy of earnings quality), the effect of ABTDs on the audit quality increases. This finding confirms the association between ABTDs and higher audit quality. There are several possible explanations for this result. We interpret this evidence as indicating that the ABTDs reflect information that represents a higher risk of earnings management and a lower earnings quality which increase auditor's efforts and time spent on the audit. Information transmitted by BTDs can help auditors to verify for a thorough way financial reporting. These findings may help us to understand the

	Step 2 (equation 2)			Step 3 (equation 3)		
Variables	Coefficient	Z	P > |z|	Coefficient	Z	P > |z|
			C-score			
ABTDs	−4.306	−5.93	0.000***			
			AUDQ			
C-score				0.065	1.97	0.049**
ABTDs				1.126	2.90	0.004***
Log likelihood			276.135			

Table X.
Regression results of structural equation model

Notes: AUDQ: audit quality index; ABTDs ABTDs residual estimated from equation (4); C-Score$_{it}$ (mediating variable) designates the conservatism level of the firm i in year t; ** and *** denote significant differences from zero at 0.05 and 0.01 levels, respectively

Mediation	Relationship	$t_{indirect}$	*P*-value
C-score	ABTDs and AUDQ	1.856	0.063*

Table XI.
Results of sobel test

Note: AUDQ: audit quality index; ABTDs ABTDs residual estimated from equation (4); C-Score$_{it}$ (mediating variable) designates the conservatism level of the firm i in year t; * denote significant differences from zero at 0.10, 0.05 and 0.01 levels, respectively

role of information reflected by BTDs in the audit process. In firms with discretionary BTDs, leaders are an incentive to disclose the good news versus bad news. In this case, the auditor should provide more effort and time to audit the financial statements of these companies.

This study produced results which corroborate the findings of a great deal of the previous work in this field. Hanlon *et al.* (2012) found a positive association between temporary BTDs and audit fees. They interpret the results as suggesting that concerns about earnings management – unrelated to tax avoidance – are more responsible for the fee and effort increase.

7. Conclusion

The purpose of the current study was to determine the direct and indirect links between BTDs and audit quality.

We use a sample of 28 Tunisian listed firms on the TSE and operating in the industrial and commercial sectors during 2005-2012. We examine this relationship by using SEM that specify both a direct link and an indirect link that is mediated by information reflected in BTDs.

This study has found that there is a positive relationship between ABTDs and audit quality. These findings suggest that earnings quality measured by accounting conservatism mediates the relationship between ABTDs and audit quality. The auditor can use information reflected in ABTDs for auditing financial statements. The relevance of ABTDs is clearly supported by the current findings. With Sobel (1982) test , the result has indicated a partial mediation.

The study has confirmed the findings of Hanlon *et al.* (2012) which found that firms with large BTDs reflecting information that represents a higher risk of earnings management, a low earnings quality causing auditors to spend more time on the audit. The present study contributes additional evidence that suggests that opportunistic sources of BTDs affects positively and significantly audit quality. Also, the empirical findings in this study provide a new understanding of audit qualitys' measure.

The findings may be of interest to the academic researchers, practitioners and regulators who are interested in discovering the informational value of BTDs in the audit process. For academic researchers, we document that opportunistic sources of BTDs have different implications for the informativeness of earnings and audit quality. For practitioners, external auditor takes into consideration the importance of the information provided by discretionary BTDs and subsequently promotes more investigation on firms' financial statements. Using discretionary component of BTDs helps regulators better understand and assess the audit quality from different dimensions.

Several limitations to this pilot study need to be acknowledged. The sample size is small to generalize the results of this study. The current study has only examined one measure of earnings quality, namely, accounting conservatism.

This research has thrown up many questions in need of further investigation. Further work needs to validate our developed measure of the audit quality index. Another possible area of future research would be to investigate the relationship between tax management, tax risk and audit quality. Future investigation must be conducted, including all the companies listed in the TSE in all the sectors, and increasing the sample size, and make comparison between the results of the sectors.

Notes

1. According to the law 82-62 of June 30, 1982 modified later by the law 88-108 of 08/18/1988.
2. They include the provisions of the Commercial Companies Code, the Labour Code, the Code of Income Tax of Natural Persons and Corporate income tax (IRPP/IS), the accounting system of Tunisian companies as well as of standards of the profession.

3. Article 13 of Tunisian code of commercial companies.
4. Cited by (Phillips *et al.*, 2003)

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