Earnings quality and cost of debt: evidence from Portuguese private companies

Abstract

Purpose: The purpose of this paper is to test the relationship between earnings quality and the cost of debt for private companies in a "code-law" country (Ball et al., 2000). The analysis controls for company size, debt level and audited information.

Design/methodology/approach: The paper uses the ordinary least squares regression technique to test the relationship between earnings quality and the cost of debt.

Findings: The collected empirical evidence shows a negative relationship between earnings quality and the cost of debt, and controls for company size and debt level. Such a relationship is stronger when the company information is audited.

Research limitations/implications: Like other studies, this paper has two main limitations. There was no access to specific data on the interest rates charged on bank loans, implying that the cost of debt is measured by the ratio of the interest expense to interest-bearing debt. The research only uses earnings quality measures based on abnormal accruals.

Practical implications: The collected evidence suggests that earnings quality have economic consequences for private companies, by affecting their cost of debt, similar to those observed in previous studies for listed companies. This evidence can be seen as an incentive for private companies increase of their financial information quality. For debt providers, namely financial institutions, the findings can be of interest to help them price properly the loans they make available to private companies. In general, the findings of this research can be of interest for company managers and financial institutions in countries with an institutional environment similar to that of Portugal.

Originality/value: The relation between earnings quality and the cost of debt has been so far studied for listed companies in "common law" countries. This paper provides new and complementary evidence about such relation for private companies and "code-law" country.

Keywords: earnings quality, cost of debt, private companies, accruals, information risk, Portugal.

Article classification: research paper

1. Introduction

In this paper we test the relationship between earnings quality and the cost of debt, in a sample of Portuguese private companies. Our sample includes 10.283 firm-year observations and covers the period 2001 to 2007. We use abnormal accruals to measure earnings quality, adopting the model proposed by Dechow and Dichev (2002), with the modification introduced by McNichols (2002), to quantify abnormal accruals. Following previous studies (e.g. Francis et al., 2005; Noguer and Muñoz, 2007; Gray et al., 2009), since information on the interest rates charged on bank loans is not available we use the ratio of interest expense to interest-bearing debt as proxy for the cost of debt. The relationship between earnings quality and the cost of debt is tested with a regression model that controls for other cost of debt determinants.

Portugal is a small country. About 99% of Portuguese companies are micro, small and medium sized entities, as defined by Recommendation 2003/361/CE (CCE, 2003). The stock exchange lists less than one hundred companies, meaning that most of Portuguese companies are private and the bank system is their main source of funding. Only listed and larger private companies are legally required to prepare audited financial statements[1].

Moreira (2006) points out three main determinants of private Portuguese companies' reporting incentives over the period studied: i) there is a strong alignment between ownership and management, which means that most of the companies are managed by the owners and thus are not affected by agency problems; ii) companies raise their financial funds directly from banks, and

are not constrained by formal debt covenants; iii) the legal environment is structured as "code-law", in the sense described by Ball et al. (2000), and there is a close alignment between the accounting and tax systems.

In this institutional setting earnings quality tend to be determined by two main incentives (Baralexis, 2004; Othman and Zeghal, 2006; Mayoral and Segura, 2009): minimization of income tax, which motivates companies to make earnings decreasing choices; and the need to signal to banks a good economic and financial condition in order to obtain funds at a reasonable cost, which motivates companies to make earnings increasing choices.

Another important feature of the Portuguese economic and financial context is that credit granted by banks is still based in informal and personal relationships, leading to more information being privately communicated which may reduce the importance of financial reporting in assessing companies' credit risk. In a similar context, more precisely for a sample of Spanish private companies, Noguer and Muñoz (2007) find a negative relationship between earnings quality and the cost of debt only for larger companies, concluding that for smaller companies those informal relationships, leading to a "relationship lending" according to Berger and Udell (2006), tend to replace financial statements information in the reduction of information asymmetries and assessment of default risk.

Our study links three extensively researched areas: earnings quality, cost of capital and debt contracting. For managers of companies using debt as a source of capital, it is important to know the factors that determine its cost in order to make decisions leading to its minimization. However the factors that determine the cost of debt are a "black box" to researchers since the lenders, especially financial institutions, do not make explicit the lending model used. Previous empirical studies suggest that earnings quality play a role in reducing the cost of debt, by documenting a negative relationship between earnings quality and such a cost. These studies are mainly undertaken for listed companies' samples and in "common law" countries (e.g. Francis et al.,

2005; Bharath et al., 2008; Gray et al., 2009; Aldamen and Duncan, 2013). An exception is the aforementioned work of Noguer and Muñoz (2007), but their results are not completely illustrative about the role of financial reporting in debt contracting, in the context of such companies. Their study does not clarify how the legal, cultural and business environment in which a company operates can influence the cost of debt. Thus, taking the limitations of their study as a motivation, our study extends the analysis by focusing particularly on the effect of companies' size, debt level and audited information on the relationship between earnings quality and the cost of debt.

Our results show that this relationship is negative for Portuguese private companies, and it holds regardless the companies' size and debt level. The results also show that earnings quality has an increased effect on the cost of debt in companies having audited financial statements. This evidence suggests that, in the Portuguese context, banks price earnings quality, and private companies could reduce their cost of debt by providing better earnings quality.

This evidence contributes to the extant literature about the relationship between earnings quality and the cost of debt, in particular in the context of private companies and "code-law" countries (e.g. Noguer and Muñoz, 2007), by showing that banks price earnings quality, regardless of companies' size and debt level. By showing that audited information enhance that relationship and its impact on the cost of debt, not only when auditing is a voluntary option (Minnis, 2011), but also when it is legally imposed, as it is the case in Portugal, this study makes a contribution. Finally, it also adds to the literature by showing that earnings quality has economic consequences (Zeff, 1978) in the case of private companies, similarly to previous evidence for listed companies (e.g. Francis et al., 2005; Bharath et al., 2008; Gray et al., 2009; Aldamen and Duncan, 2013). These consequences can be an incentive private companies have to prepare better quality financial information, given that financial institutions price such a quality. This research can be of interest for companies' managers and financial institutions in countries with an institutional environment similar to that of Portugal.

The remainder of the paper is structured as follows. In Section 2 we introduce the earnings quality concept. In Section 3 we review the relevant literature and formulate the research hypotheses. In Section 4 we discuss the research design, presenting the model, the empirical proxies, the sample and descriptive statistics. In Section 5 we report and discuss the results of the study. In Section 6 we describe the sensitivity tests. Finally, in Section 7 we summarize the main results and discuss the implications for future research.

2. Earnings quality

Earnings are a summary measure of firm performance produced under accounting accrual basis (Dechow, 1994) and the premier source of firm specific information provided in financial statements (Lev, 1989). Earnings are used in many stakeholders' decisions. In predicting future performance, investors prefer earnings to other measures as dividends or cash flows. Equity valuation models incorporate earnings as predictors of future cash flows. Management performance and compensation tend to be stated in terms of earnings. In debt contracting earnings are used to assess credit risk in rating and scoring models, impose debt covenants thresholds or establish performance-pricing provisions.

The definition of earnings quality depends on the decision maker's objectives and on the role earnings play in the decision model (Dechow et al., 2010). In general, earnings quality is associated with relevant attributes like the magnitude of accruals, persistence, predictability, smoothness, value relevance, timeliness and conservatism (Schipper and Vincent, 2003; Dechow and Schrand, 2004; Christensen et al., 2005; Dechow et al., 2010).

Moreover, earnings quality also depends on the financial reporting model and on the business environment. On the one hand, the flexibility of accounting rules and the presence of reporting incentives could lead to earnings management and, in turn, to a poorer earnings quality. On the other hand, firms with complex transactions, firms in volatile business environments, or

high-growth firms, may not provide earnings numbers that are good indicators of future cash flows, even in the absence of earnings management, and this may wrongly be taken as a sign of poor earnings quality.

As pointed out by Yee (2006), defining earnings quality involves considering two aspects of reported earnings: first, the fundamental attribute and second, the financial reporting attribute. Fundamental earnings is the accounting performance measure for assessing the company's ability to generate future cash flows. Reported earnings are the imperfect signal of fundamental earnings announced by the company. Thus, earnings quality depends on how quickly and precisely reported earnings reveal fundamental earnings.

In this paper we use accruals to measure earnings quality. Accruals are a financial reporting attribute with an important role in assessing earnings quality. The use of accrual accounting makes earnings a better indicator of firm performance and future cash flows than does information about current cash receipts and payments (FASB, 1980, §44). This is because accruals mitigate timing and mismatching problems in measuring cash flows over short time intervals, and management can use accruals to signal their private information about firms' cash generating ability (Dechow, 1994; Dechow et al., 1998). Nevertheless, accruals may make earnings less informative than cash flows due to estimation errors (Dechow and Dichev, 2002) or if they are used to opportunistically manipulate earnings (Schipper, 1989; Healy and Wahlen, 1999).

Using accruals as a measure of earnings quality requires to split them into two components: normal (or non-discretionary) accruals and abnormal (or discretionary) accruals. Normal accruals are meant to capture adjustments that reflect the company's fundamental performance, while the abnormal accruals capture estimation errors and earnings management. To the extent that abnormal accruals represent a distortion in the accrual process, earnings quality is negatively associated with the magnitude of this component of accruals. In empirical research, the split of accruals into those components is performed by a linear regression model that represents the

generating process of normal accruals and takes the estimation errors as abnormal accruals. The absolute value or the standard deviation of the residuals tend to be taken as an inverse measure of earnings quality. The model we will use to measure the abnormal component of accruals will be addressed in more detail in Section 4.

3. Literature review and hypotheses development

The Agency Theory states that debt contracting is characterized by the presence of potential conflicts of interest and information asymmetries between the owners-managers (the agent) and the lenders (the principal), giving rise to the agency costs of debt (Jensen and Meckling, 1976).

Financial information can fulfill an important role in reducing information asymmetries and agency conflicts between owners-managers and lenders (Armstrong et al., 2010; Shivakumar, 2013). When defining the contractual terms of a loan, financial information is used to reduce adverse selection problems, by helping to assess the performance and financial position of the borrower. During the term of the loan, moral hazard problems, like risk-shifting or dividend overpayment (Jensen and Meckling, 1976; Smith and Warner, 1979), can be reduced by including accounting-based covenants that limit the owners-managers' actions such as paying out dividends, and trigger the lenders' right to recall or renegotiate the loan in case of violation.

Even in the absence of formal accounting-based covenants, as it tends to happen in Portugal, financial information plays a role in lending decisions, since banks assess the company's default risk based on that information, in particular on earnings. In this context, earnings quality is seen as a feature that enables lenders to assess more accurately the company's default risk, being related to its ability to assist lenders in forecasting the company's future earnings and cash flows. Thus, as we mentioned above, it seems natural that lenders value (price) such quality, reflecting it on the cost of debt, because higher earnings quality is expected to reduce lenders' information risk.

Information risk represents the likelihood that firm-specific information that is pertinent to financing decisions is not available (asymmetric information), or is of poor quality (inaccurate information)[2]. As with default risk, information risk can lead financial institutions not to lend, lend at higher interest rates or require the provision of guarantees.

If information risk is reflected in interest rates, firms with poorer financial information quality tend to bear a higher cost of debt than firms with better financial information quality. That is, it is expected a negative relationship between financial information quality and the cost of debt. This relationship has been documented empirically in studies that address information risk through different features of financial information, namely: earnings quality (e.g. Francis et al., 2005; Noguer and Muñoz, 2007; Bharath et al., 2008; Gray et al., 2009; Aldamen and Duncan, 2013); the submission of financial statements to voluntary external audit (e.g. Blackwell et al., 1998; Allee and Yohn, 2009; Minnis, 2011; Kim et al., 2011a; Dedman and Kausar, 2012); external audit quality (e.g. Pittman and Fortin, 2004; Karjalainen, 2011; Kim et al., 2013); and disclosure quality (e.g. Mazumdar and Sengupta, 2005; Kim et al., 2011b).

In this study information risk is addressed through earnings quality that is measured through abnormal accruals. Previous studies have been focused mainly in common law countries and listed companies, and document a negative relationship between earnings quality and the cost of debt. However, a study conducted on a sample of Spanish private companies by Noguer and Muñoz (2007) shows that this relationship does not hold for small private companies in a bank-based financial system. In this context it seems that banks, when deciding interest rates for small companies, tend to solve their information asymmetries problems replacing financial statement information with informal information disclosed by managers, putting extra emphasis on the personal relationship. The financial decision on the loan concession becomes a "relationship lending" (Berger and Udell, 2006).

Given that in the Portuguese context companies' size tend to be smaller compared to the Spanish one, we expect that earnings quality may affect the cost of debt irrespective of company size, because the lending relationship seems not to be sufficient for financial institutions overcoming potential inaccurate information that financial reports may contain, namely those that are not audited. Such type of information tends to be captured by abnormal accruals, our measure of earnings quality. This intuition is translated in our first hypothesis that follows:

H1: The cost of debt of Portuguese private companies is negatively related to its earnings quality, regardless of the company's size.

Minnis (2011) examines the effect of voluntary external audits on the cost of debt, for U.S. private companies. The results show that companies with audited financial information have a significantly lower cost of debt and that lenders place more weight on audited financial information when setting the interest rate because they consider that audits increase the quality of earnings. As explained in the previous section, in Portugal the preparation of audited financial statements by private companies is a legal obligation required only to larger companies. Because auditing increases the quality of financial information, helps to reduce agency conflicts and information asymmetry and, hence, helps to decrease the cost of debt (e.g. Pittman and Fortin, 2004; Karjalainen, 2011), we expect audited information affects the relationship between earnings quality and the cost of debt. This intuition is expressed next as our second hypothesis:

H2: The effect of earnings quality in reducing the cost of debt of Portuguese private companies tends to be higher when they have audited financial statements.

Martins and Moreira (2009) examine the relationship between the level of companies' bank debt and earnings quality for Portuguese private companies. They find that such relationship is not linear, being positive for low levels of bank debt, and negative for high levels of bank debt. Likewise, Ghosh and Moon (2010) and Valipour and Moradbeygi (2011) analyze the relationship between total debt and earnings quality, and find evidence that debt can either create incentives to

manage earnings or improve their quality in order to influence financing conditions, particularly the cost of debt. The most indebted companies are more prone to manage earnings to hide their true economic and financial condition to debt holders, trying to avoid an increase in the cost of debt. The less indebted companies have incentives to increase earnings quality in order to provide debt holders better information about future cash flows, reducing information risk and thereby reducing agency conflicts. Acting that way they expect to decrease the cost of debt. In the current study we also test such an expectation, to see whether the level of debt can influence the relationship between earnings quality and the cost of debt. However, we have a different expectation. If more indebted companies manage their earnings to hide from creditors their real financial and economic situation, the earnings quality measure will pick up that information. Therefore, it is not expected that the relationship between such quality and the cost of debt changes because of debt level. This intuition is reflected in our third hypothesis:

H3: The cost of debt of Portuguese private companies is negatively related to its earnings quality, regardless of the level of debt.

4. Research design

4.1 Regression model specification

In line with previous studies (e.g. Francis et al., 2005; Noguer and Muñoz, 2007; Bharath et al., 2008; Gray et al., 2009; Aldamen and Duncan, 2013), the relationship between the cost of debt and earnings quality is tested using an Ordinary Least Squares regression model that includes also a set of variables in order to control for the effect of other determinants of the cost of debt, as follows:

$$INT_{i,t} = \beta_0 + \beta_1 EQ_{i,t-1} + \beta_2 IC_{i,t-1} + \beta_3 LIQ_{i,t-1} + \beta_4 COL_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 SIZE_{i,t-1} + \sum_{k=01}^{74} \beta_l IND_k + \sum_{n=2001}^{2007} \beta_j YEAR_n + \varepsilon_{i,t} \quad [1]$$

where $INT_{i,t}$ represents the cost of debt of firm *i* in year *t* estimated as the ratio of interest expense of year *t* to the average interest bearing debt in the beginning and end of year *t*; $EQ_{i,t-1}$ is the measure of earnings quality of firm *i* in year *t-1* proxied by the symmetrical of the absolute value of abnormal accruals ($-|\varepsilon_{it}|$) and will be explained in more detail in the next Section; $IC_{i,t-1}$ is the interest coverage ratio of firm *i* in year *t-1* estimated as earnings before interest, taxes, depreciation and amortization (EBITDA), divided by interest expense; $LIQ_{i,t-1}$ is the liquidity ratio of firm *i* in year *t-1* estimated as current assets divided by current liabilities; $COL_{i,t-1}$ is a proxy for assets that can be pledged as collateral by firm *i* in year *t-1* and is calculated as property, plant and equipment (PPE) divided by total assets; $LEV_{i,t-1}$ is the leverage ratio of firm *i* in year *t-1* and is calculated as total debt divided by total assets; $SIZE_{i,t-1}$ is measured by the natural log of total assets of firm *i* in year *t-1*; IND_k and $YEAR_n$ are sets of dummy variables coded 1 if the observation belongs, respectively, to the industry or to the fiscal year, coded 0 otherwise, and are included in the model to control for potential industry-specific and time-varying macroeconomic effects on debt pricing. Industry is defined as the two-digit Portuguese Standard Industrial Classification (Revision 2.1). All explanatory variables are lagged one year because it is assumed that the definition of the contractual terms of a bank loan, as interest rate, are based on accounting information from the previous year (e.g. Noguer and Muñoz, 2007).

The estimated coefficient on *EQ* (β_1) captures the earnings quality effect on the cost of debt that is incremental to the control factors. All else equal, if lenders price *EQ* there will be a negative association between *INT* and *EQ*, thus β_1 will be negative. Concerning the control variables, we expect a negative association of *INT* with *IC*, *LIQ*, *COL* and *SIZE* (e.g. Noguer and Muñoz, 2007) and a positive association with *LEV* (e.g. Gray et al., 2009).

The first hypothesis stated assumes that the company's size does not influence the relationship between the cost of debt and earnings quality. To test this premise, we introduce in model [1] a dummy variable, *DSize*, that takes the value 1 when the company's total assets are

above the sample median and 0 otherwise, as well as an interaction variable between size and earnings quality, *DSize*EQ*, giving rise to the model [2] shown below.

$$INT_{i,t} = \beta_0 + \beta_1 DSize_{i,t-1} + \beta_2 EQ_{i,t-1} + \beta_3 DSize_{i,t-1} * EQ_{i,t-1} + \beta_4 IC_{i,t-1} + \beta_5 LIQ_{i,t-1} + \beta_6 COL_{i,t-1} + \beta_7 LEV_{i,t-1} + \beta_8 SIZE_{i,t-1} + \sum_{k=01}^{74} \beta_l IND_k + \sum_{n=2001}^{2007} \beta_j YEAR_n + \varepsilon_{i,t} \quad [2]$$

We expect that the coefficient of variable *DSize* (β_1) to be negative indicating that larger companies bear, on average, a lower cost of debt, which is consistent with the expected relationship between *SIZE* and *INT* in model [1]. For the coefficient of variable *DSize*EQ* (β_3), as stated in hypothesis H1, we do not expect it to be significant at the usual levels of significance.

The second hypothesis predicts that the effect of earnings quality in reducing the cost of debt tends to be higher for companies with audited financial statements. To test this we introduce a dummy variable in model [1], *DAudit*, that takes the value 1 when the firm's financial statements are subject to audit, 0 otherwise, as well as a set of interaction variables between this one and the remaining variables, yielding the model [3] shown below.

$$INT_{i,t} = \beta_0 + \beta_1 DAudit_{i,t-1} + \beta_2 EQ_{i,t-1} + \beta_3 DAudit_i * EQ_{i,t-1} + \beta_4 IC_{i,t-1} + \beta_5 DAudit_i * IC_{i,t-1} + \beta_6 LIQ_{i,t-1} + \beta_7 DAudit_i * LIQ_{i,t-1} + \beta_8 COL_{i,t-1} + \beta_9 DAudit_i * COL_{i,t-1} + \beta_{10} LEV_{i,t-1} + \beta_{11} DAudit_i * LEV_{i,t-1} + \beta_{12} SIZE_{i,t-1} + \beta_{13} DAudit_i * SIZE_{i,t-1} + \sum_{k=01}^{74} \beta_l IND_k + \sum_{n=2001}^{2007} \beta_j YEAR_n + \varepsilon_{i,t} \quad [3]$$

In companies with unaudited financial statements (model [3], *DAudit*=0) the constant is β_0 and the coefficients of the variables are given by: β_2 for *EQ*; β_4 for *IC*; β_6 for *LIQ*; β_8 for *COL*; β_{10} for *LEV*; and β_{12} for *Size*. In companies with audited financial statements (model [3], *DAudit*=1) the constant is given by (β_0+β_1) and the coefficients of the variables are: (β_2+β_3) for *EQ*; (β_4+β_5) for *IC*; (β_6+β_7) for *LIQ*; (β_8+β_9) for *COL*; (β_{10}+β_{11}) for *LEV*; and (β_{12}+β_{13}) for *Size*. This model allows us to also test whether the effect of the remaining determinants of the cost of debt is different between companies with audited and unaudited financial statements and, thus, to compare our results to those of Minnis (2011).

In line with model [1] we expect the coefficient of *EQ* to be significantly negative both for audited (β_2+β_3) and unaudited companies (β_2). As stated in hypothesis H2, we expect the coefficient β_3 to be significantly negative indicating a higher effect of *EQ* on reducing the cost of debt for audited companies. Concerning the remaining variables, in line with model [1] we expect a negative association of *INT* with *IC*, *LIQ*, *COL* and *SIZE* and a positive association with *LEV*, both for audited and unaudited companies. In line with the results of Minnis (2011) we expect that the coefficients β_5, β_7 and β_9 to be significantly negative and β_{11} to be significantly positive, indicating that the ratios *IC*, *LIQ*, *COL* and *LEV* have a greater effect on the cost of debt when they are based on audited information.

The third hypothesis is intended to test whether the level of companies' debt influences the relationship between the cost of debt and earnings quality. To evaluate this hypothesis, we introduce in model [1] a dummy variable, *DLev*, that takes the value 1 when the debt (*LEV*) is below the median of the sample, 0 otherwise, as well as an interaction variable between this and the earnings quality, *DLev*EQ*, giving rise to the model [4] shown below.

$$INT_{i,t} = \beta_0 + \beta_1 DLev_{i,t-1} + \beta_2 EQ_{i,t-1} + \beta_3 DLev_{i,t-1} * EQ_{i,t-1} + \beta_4 IC_{i,t-1} + \beta_5 LIQ_{i,t-1} + \beta_6 COL_{i,t-1} + \beta_7 LEV_{i,t-1} + \beta_8 SIZE_{i,t-1} + \sum_{k=01}^{74} \beta_l IND_k + \sum_{n=2001}^{2007} \beta_j YEAR_n + \varepsilon_{i,t} \quad [4]$$

We expect that the coefficient of *DLev* (β_1) will be negative indicating that, on average, less indebted companies bear a lower cost of financing, which is consistent with the expected relationship between *LEV* and *INT* in model [1]. For the coefficient of variable *DLev*EQ* (β_3), as stated in hypothesis H3, we do not expect it to be significant at the usual levels of significance.

4.2 Earnings quality measure

As explained is Section 2, our measure of earnings quality is based on abnormal accruals. To separate the normal and abnormal components of accruals we use the model proposed by Dechow and Dichev (2002) with the modification introduced by McNichols (2002), as follows:

$$WCA_{i,t} = \alpha_0 + \alpha_1 CFO_{i,t-1} + \alpha_2 CFO_{i,t} + \alpha_3 CFO_{i,t+1} + \alpha_4 \Delta Sales_{i,t} + \alpha_5 PPE_{i,t} + \varepsilon_{i,t} \quad [5]$$

where $WCA_{i,t}$ are the working capital accruals defined as the change in working capital of company *i* in year *t*[3]; $CFO_{i,t-1}$, $CFO_{i,t}$ and $CFO_{i,t+1}$ are cash flows from operations in year *t-1*, *t* and *t+1,* respectively; $\Delta Sales_{i,t}$ is the change in sales; and $PPE_{i,t}$ is the plant and equipment. We compute *CFO* indirectly, by subtracting the accrual component from operating income, rather than directly as advocated by Hribar and Collins (2002), because companies included in our sample are not required to submit the statement of cash flows. All variables are deflated by average total assets of year *t* in order to avoid heterocedasticity problems.

Accruals are temporary adjustments that delay or anticipate the recognition of realized cash flows (normal accruals) plus an estimation error term (abnormal accruals). Regarding working capital accruals, the corresponding cash flow realizations generally occur within one year, and normal accruals are expected to be negatively related to current cash flows ($\alpha_2 < 0$) and positively related to past and future cash flows ($\alpha_3 > 0$ and $\alpha_4 > 0$). So, normal accruals are those that perfectly match with the cash flows from the previous, current and next year. The modification proposed by McNichols (2002) introduces in the model the variables $\Delta Sales_{i,t}$ and $PPE_{i,t}$ from the Jone's model (1991), in order to exclude from the residuals (abnormal accruals) those accruals induced by changes in economic fundamentals of the company (considered as normal accruals).

In line with previous studies, our cross-sectional regressions were performed with a minimum of 20 observations per year and industry (e.g. Francis et al., 2005; Noguer and Muñoz, 2007). Normal accruals are given by the fitted values, obtained by applying firm-year variables to the industry-specific parameters. Abnormal accruals are given by the firm-year residuals (ε_{it}).

Taking into account that the greater the magnitude of abnormal accruals, regardless of their sign, the lower the quality of earnings, this variable is measured as the symmetrical of the absolute value of abnormal accruals ($EQ_{i,t} = -|\varepsilon_{it}|$), so that larger $EQ_{i,t}$ values represent better earnings quality. We consider this an appropriate measure because it works better than the use of abnormal

accruals standard deviations in short time periods, and it does not require knowing beforehand the direction of earnings management or measurement errors (Francis et al., 1999; Maijoor and Vanstraelen, 2006).

4.3 Sample and descriptive statistics

The sample was collected from the SABI database for the period 1998-2007[4]. We restrict our analysis to companies having total assets larger than 1 million euros (M€) in order to eliminate smaller companies where the provision of personal guarantees by the owners is more common and could distort the analysis (Noguer and Muñoz, 2007). Furthermore, we exclude the financial, real estate and public institutions because they have fundamental differences in the accrual generating process. We also remove observations with negative equity because it indicates companies with severe financial constraints and could distort results because of different reporting incentives (e.g. Jaggi and Lee, 2002). This selection process generates an initial sample of 193.680 firm-year observations.

When the interest rate of bank loans is not directly observable, as it happens in the current case, researchers use the ratio of interest expense to the average interest bearing debt, to proxy for the cost of debt (Francis et al., 2005; Noguer and Muñoz, 2007; Gray et al., 2009; Ballesta and Meca, 2010; Minnis, 2011; Karjalainen, 2011). The use of the average interest bearing debt, that is, the mean value of the financial debt at the beginning and at the end of the year, aims to approximate the denominator of that ratio to the notional on which interest was calculated. However this procedure may introduce volatility on the estimated interest rates in the presence of large variations in debt (Minnis, 2011; Aldamen and Duncan, 2013). Also, establishing a relationship between the cost of debt and their determinants could be meaningless if companies have a low level of financial debt. For this reason, in the computation of the *INT* variable we only consider observations with average interest bearing debt greater than or equal to 5% of total assets

(Noguer and Muñoz, 2007), and we remove observations where interest bearing debt increases to more than double, or reduces to less than half, the beginning of the year debt (Minnis, 2011).

After removing observations with missing data and imposing additional requirements associated with the estimation of the variables cost of debt (*INT*) and earnings quality (*EQ*), we obtain 12.569 observations. The final sample, after computing the remainder variables of model [1] consists of 10.283 observations, for the period 2001-2007. The sample selection process is presented in more detail in Table 1.

[Insert Table 1]

Table 2 discloses the main descriptive statistics for the variables of the model [1].

[Insert Table 2]

The mean (median) value for the cost of debt (*INT*) is about 11,1% (8,68%), which seems to be consistent with the level of interest rates banks tended to charge in the period. The average value is above the median, reflecting slightly positive skewness of this variable, which reveals the existence of observations with very high values for the cost of financing. The liquidity ratio (*LIQ*) is above the unit for more than half of the observations, which reveals that most companies seem to be able to meet its short-term commitments and have positive working capital fund. On average, earnings before interest, taxes, depreciation and amortization covers interest expense (variable *IC*). The mean and median values for *COL* indicate that about 29% of total assets are property, plant and equipment and that about half of the firms have collateral ratios above 25%. The mean and median values of *LEV* demonstrate the importance of lenders and creditors in the financial structure of the firms analyzed.

Table 3 shows the matrix of Pearson correlations.

[Insert Table 3]

The Pearson correlations between independent variables are not high (the highest value is -0,33 for the correlation between *LEV* and *LIQ*), suggesting that multicollinearity is not likely to be

a problem. The correlation between *EQ* and *INT* is negative and statistically significant, suggesting that there is a linear relationship between those variables, and supporting our expectations. The remaining variables, except *LIQ*, present significant correlations with *INT* suggesting the linear relationship expected between those variables.

5. Results and discussion

Table 4 displays the results of OLS estimation of models [1] and [2].

[Insert Table 4]

The estimation of model [1] shows, as predicted, a negative and statistically significant coefficient for the variable *EQ*. This result corroborates the existence of a negative relationship between earnings quality and the cost of debt for Portuguese private companies, similar to that found in previous studies (e.g. Francis et al., 2005; Bharath et al., 2008). In the estimation of model [2] the coefficient of the variable *DSize*EQ* is not statistically significant at less than 5%, which suggests that the effect of the *EQ* on *INT* is not statistically different between smaller and larger companies. The difference between the coefficients of the variable *EQ* in larger companies ($\beta_2+\beta_3$) and smaller companies (β_2), tested using the Wald test, is not statistically significant, as expected. This evidence supports the first research hypothesis, which predicts that cost of debt of Portuguese private companies is negatively related to its earnings quality, regardless of a company's size.

It should be emphasized that these results are different from those observed by Noguer and Muñoz (2007) for Spanish companies. These authors only find the existence of a negative relationship between the cost of debt and earnings quality for larger companies and conclude that, for smaller companies, relationship lending seems to replace the financial statement information in the assessment of default risk.

Regarding the control variables, the results support the expected association between the cost of debt and their determinants, except for leverage (*LEV*) that presents an unexpected negative coefficient indicating a negative relationship between *INT* and *LEV*[5].

Both models show a *F* statistic significantly different from zero, allowing us to conclude that each of them fit the data, despite an adjusted R^2 somehow small. The White test rejects the null hypothesis of homocedasticity for all the models, and the Breusch-Godfrey test rejects the null hypothesis of no serial correlation in residuals for all the models. To obtain a robust estimation to heterocedasticity and dependence of residuals we followed the procedure proposed by Petersen (2009), addressing cross-sectional dependence parametrically, with time dummies, and for time-series dependence we estimated standard errors clustered by firm. Thus, the coefficients and their level of significance are strong and allow us to draw conclusions on testing the hypothesis[6].

Table 5 displays the results for model [3], that tests whether the relationship between the cost of debt and earnings quality is different for companies with audited financial statements.

[Insert Table 5]

The coefficient of the constant variable of the companies with audited financial statements is lower than that for companies with unaudited financial statements and the Wald test indicates that this difference is statistically significant at 1%. This result suggests that companies with audited financial statements support, on average, a lower cost of debt than companies with unaudited financial statements. However, it should be noted that in Portugal companies with audited financial statements are also the larger companies, so this effect may be the effect of company's size on its cost of debt.

The coefficient of *EQ* is negative and statistically significant either in companies with audited financial statements or with unaudited financial statements, as expected, and the difference between the *EQ* coefficient in both types of companies is statistically significant at less than 5% level, showing that *EQ* has a greater effect on reducing the cost of debt in companies with audited

financial statements. This result suggests that banks value more audited financial information when deciding the interest rate to charge, which is consistent with the results found by Minnis (2011). This evidence fully supports our second hypothesis.

Regarding the control variables, we only find statistically significant differences for *IC* and *SIZE*. Differently from the result found by Minnis (2011), we observe that the effect of *IC* in the determination of the cost of debt is greater in companies with unaudited financial statements.

Table 6 displays the results for model [4] which tests whether the level of company's debt influences the relationship between the cost of debt and earnings quality.

[Insert Table 6]

They show a negative and statistically significant coefficient for *DLev* indicating, as expected, that less indebted companies bear a lower cost of debt. The coefficient on *EQ* variable is negative and statistically significant, as in the previous models. This relationship also holds for less indebted companies, for which the coefficient of *EQ*, given by ($\beta_2 + \beta_3$), is also negative and the Wald test reveals that it is statistically significant at the 5% level.

The coefficient of *DLev*EQ* is not statistically significant, suggesting that the effect of the earnings quality on the cost of debt is not affected by the level of companies' debt. The difference between the coefficients of *EQ* in most indebted companies (β_2) and less indebted companies ($\beta_2 + \beta_3$) was also tested by the Wald test, and is still not statistically significant.

Thus, the results discussed so far in the current section support the hypotheses stated in the previous section.

6. Sensitivity analyses

To ensure the robustness of our results, we perform two types of sensitivity tests. The first is intended to test the sensitivity of our results to the presence of outliers in the cost of debt. For this purpose we adopt the following alternative procedures to eliminate the extreme observations: elimination of 1% of the observations in the left and right tails of the distribution; elimination of

5% observations in the left and right tails of the distribution; and elimination of 1% of the observations in the left tail and 5% of the observations in the right tail of the distribution (e.g. Noguer and Muñoz, 2007). The estimation results of the models with these changes (not tabulated) show results and conclusions similar to those previously discussed.

The second sensitivity analysis consists of testing our results to alternative specifications of accruals models. To this end, abnormal accruals were estimated using the following models: the Jones (1991) model; the Jones model with the modification suggested by Dechow et al. (1995); the Jones model with modification suggested by Kothari et al. (2005); and the original model of Dechow and Dichev (2002). The results obtained (not tabulated) with these alternative measures of abnormal accruals do not affect qualitatively our conclusions.

Another sensitivity test was ran, and is described in Note 5.

7. Conclusions

This paper examines the relationship between earnings quality and the cost of debt for Portuguese private companies. Previous studies suggest that this relationship is negative, but they are mainly conducted using listed companies' data samples and in "common law" countries (e.g. Francis et al., 2005; Bharath et al., 2008; Gray et al., 2009; Aldamen and Duncan, 2013). A study carried out by Noguer and Muñoz (2007) in a context similar to the Portuguese one, more precisely with a sample of Spanish private companies, only finds that negative relationship for larger companies. Regarding smaller companies, the authors conclude that banks tend to replace the financial statement information by relationship lending in the assessment of default risk.

Our intuition was different and the results support it. The existence of a negative relationship between earnings quality and the cost of debt for Portuguese private companies holds regardless their size. This result seems to confirm that lending relationship is not sufficient for banks overcoming potential inaccurate information that financial reports may contain and that banks price the information risk irrespective of company size.

Considering previous evidence showing that the level of bank debt may influence earnings quality (Martins and Moreira, 2009; Ghosh and Moon, 2010; Valipour and Moradbeygi, 2011) this study also tests whether the relationship between earnings quality and the cost of debt is affected by a company's level of debt. The results show that the negative relationship between earnings quality and the cost of debt holds regardless the companies' debt level.

The paper also examines whether the effect of earnings quality in reducing the cost of debt is different between companies with audited and companies with unaudited financial statements. The results of this analysis show that earnings quality has a greater effect on reducing the cost of debt in companies having audited financial statements. This finding suggests that banks give greater importance to audited financial information when deciding the interest rate, which is consistent with the results found by Minnis (2011).

This paper makes a few contributions to the literature. It brings further light on the effect of earnings quality on the cost of debt for the context of small private companies in "code-law" countries. The evidence shows that the quality of earnings has also economic consequences (Zeff, 1978) for private companies and may provide an incentive for managers preparing better quality financial information. This way, the paper adds to the literature on the Agency Theory (Jensen and Meckling, 1976), and how the conflicts between lenders and borrowers tend to be circumvented by financial information quality. As far as we know, this paper is also the first empirical study to investigate the relationship between earnings quality and the cost of debt in Portugal, helping to understand the behavior of banks in the lending relationship and allowing companies to accommodate their information strategies in order to minimize the cost of debt.

Nevertheless, this study has limitations. The first is related to the proxy for the cost of debt that, as stated by Aldamen and Duncan (2013), represents a measure with some noise that can lead the conclusion that there is no relationship between earnings quality and the cost of debt when it exists. However, the fact that we have found that relationship using this proxy suggests that our

results are robust and it would also be found if we used the interest rates charged on bank loans. Another limitation relates to the only use of measures of earnings quality based on abnormal accruals. In future research it would be relevant to address other measures of earnings quality, as conservatism or persistence.

Notes

1. In Portugal, the preparation of audited financial statements is a legal obligation to listed firms, private firms that issue securities and private limited companies that exceeds two of the three following criteria, during two consecutive years: (i) total assets: 1500000 euros; (ii) gross revenues: 3000000 euros; and (iii) number of employees: 50.

2. The concept of "information risk" arises in studies that analyze how the information disclosed to the market can affect the returns required by investors and the cost of capital (Habib, 2006). In this context "information risk" is defined as follows: "*Information risk refers to a variety of risks that investors may face as a result of possessing inadequate or imprecise information on which to base their investment decisions.*" (Bhattacharya et al., 2003, p. 642), or "*By information risk, we mean the likelihood that firm-specific information that is pertinent to investor pricing decisions is of poor quality.*" (Francis et al., 2005, p. 296)

3. $WCA_{i,t} = \Delta CA_{i,t} - \Delta Cash_{i,t} - \Delta CL_{i,t} + \Delta Debt_{i,t}$ where: $\Delta CA_{i,t}$ represents the change in current assets of firm *i* in year *t*; $\Delta Cash_{i,t}$ represents the change in cash and cash equivalents of firm *i* in year *t*; $\Delta CL_{i,t}$ represents the change in current liabilities of firm *i* in year *t*; and $\Delta Debt_{i,t}$ represents the change in short-term bank debt of firm *i* in year *t*.

4. SABI is the acronym for "Sistema de Análise de Balanços Ibéricos" (Iberian Balance Sheet Analysis System), and is a proprietary database from the Bureau van Dijk. We used the January 2009 version. The accounting data included in the database concerns only to balance sheet and income statement. The period chosen for the current study is justified by the availability of information in the database.

5. It should be noted that this result has already been found in previous studies, such as Francis et al. (2005), Minnis (2011) and Karjalainen (2011). Minnis (2011) argues that most indebted companies may be companies that use larger amounts of funding, benefiting from economies of scale that allows them to get lower interest rates. Francis et al. (2005) and Karjalainen (2011) present another explanation based on the mechanical relationship between those variables, because the numerator of *LEV* and the denominator of *INT* increase with interest-bearing liabilities. We consider that there may be another reason for that negative relationship: the increase in the level of interest-bearing debt could be accompanied by the provision of collateral, resulting in an inverse relationship between leverage and default risk, and consequently an inverse relationship between leverage and the cost of debt. We test this explanation considering that the variable *TANG* is a proxy for the assets that can be pledged as collateral and introducing in model [1] an interaction between variables *TANG* and *LEV*. The results of the estimation of the model [1] with this modification (not reported) show a negative and statistically significant sign for the interaction variable. In turn, *COL* and *LEV* failed to present statistically significant coefficients. This result supports the idea that there is a joint effect of *COL* and *LEV* on the cost of debt.

6. The same statistical procedure was adopted in the other estimated models.

References

Aldamen, H. and Duncan, K. (2013), "Pricing of innate and discretionary accruals in Australian debt", *Accounting and Finance*, Vol. 53, pp. 31–53.

Allee, K. D. and Yohn, T. L. (2009), "The demand for financial statements in an unregulated environment: an examination of the production and use of financial statements by privately held small businesses", *The Accounting Review*, Vol. 84 No. 1, pp. 1-25.

Armstrong, C. S., Guay, W. R. and Weber, J. (2010). "The role of information and financial reporting in corporate governance and debt contracting", *Journal of Accounting and Economics,* Vol. 50, pp. 179-234.

Ball, R., Kothari, S. P. and Robin, A. (2000), "The effect of international institutional factors on properties of accounting earnings", *Journal of Accounting and Economics,* Vol. 29, pp. 1-51.

Ballesta, J. P. S. and Meca, E. G. (2011), "Ownership structure and the cost of debt", *European Accounting Review*, Vol. 20 No. 2, pp. 389–416.

Baralexis, S. (2004), "Creative accounting in small advancing countries: The Greek case", *Managerial Auditing Journal,* Vol. 19 No. 3, pp. 440-461.

Berger, A. N. and Udell, G. F. (2006), "A more complete conceptual framework for SME finance", *Journal of Banking and Finance,* Vol. 30, pp. 2945-2966.

Bharath, S. T., Sunder, J. and Sunder, S. V. (2008), "Accounting quality and debt contracting", *The Accounting Review,* Vol. 83 No. 1, pp. 1-28.

Bhattacharya, U., Daouk H. and Welker, M. (2003), "The world price of earnings opacity", *The Accounting Review*, Vol. 78 No. 3, pp. 641-678.

Blackwell, D. W., T. R. Noland and Winters, D. B. (1998), "The value of auditor assurance: evidence from loan pricing", *Journal of Accounting Research*, Vol. 36 No. 1, pp. 57–70.

Cánovas, G. H. and Solano, P. M. (2006), "Banking relationships: effects on debt terms for small Spanish firms", *Journal of Small Business Management*, Vol. 44 No. 3, pp. 315–333.

CCE, Comissão das Comunidades Europeias, (2003), "Recomendação da Comissão 2003/361/CE de 20.05.2003 relativa à definição de micro, pequenas e médias empresas", *Jornal Oficial da União Europeia L 140*, pp. 36-40.

Christensen, P. O., Feltham, G. A. and Sabac, F. (2005), "A contracting perspective on earnings quality", *Journal of Accounting and Economics,* Vol. 39, pp. 265-294.

Dechow, P. M. (1994), "Accounting earnings and cash flows as measures of firm performance : The role of accounting accruals", *Journal of Accounting and Economics,* Vol. 18, pp. 3-42.

Dechow, P. M. and Dichev, I. D. (2002), "The quality of accruals and earnings: the role of accrual estimation errors", *Accounting Review,* Vol. 77, pp. 35-59.

Dechow, P. M., Ge, W. and Schrand, C. M. (2010), "Understanding earnings quality: A review of the proxies, their determinants and their consequences", *Journal of Accounting and Economics,* Vol. 50, pp. 344-401.

Dechow, P. M., Kothari, S. P. and Watts, R. L. (1998), "The relation between earnings and cash flows", *Journal of Accounting and Economics,* Vol. 25, pp. 133-168.

Dechow, P. M. and Schrand, C. M. (2004), *Earnings quality*, Charlottesville: The Research Foundation of CFA Institute.

Dechow, P. M., Sloan, R. G. and Sweeney, A. P. (1995), "Detecting earnings management", *Accounting Review,* Vol. 70 No. 2, pp. 193-225.

Dedman, E. and Kausar, A. (2012), "The impact of voluntary audit on credit ratings: evidence from UK private firms", *Accounting and Business Research*, Vol. 42 No. 4, pp. 397–418.

FASB, Financial Accounting Standards Board, (1980), *Statement of Financial Accounting Concepts n.º 2 - Qualitative characteristics of accounting information*, Standford, CT: FASB.

Francis, J., LaFond, R., Olsson, P. and Schipper, K. (2005), "The market pricing of accruals quality", *Journal of Accounting and Economics,* Vol. 39, pp. 295-327.

Francis, J. R., Maydew, E. L. and Sparks, H. C. (1999), "The role of Big 6 auditors in the credible reporting of accruals", *Auditing,* Vol. 18 No. 2, pp. 17-34.

Ghosh, A. and Moon, D. (2010), "Corporate debt financing and earnings quality", *Journal of Business Finance and Accounting,* Vol. 37 No 5/6, pp. 538-559.

Gray, P., Koh, P. S. and Tong, Y. H. (2009), "Accruals quality, information risk and cost of capital: evidence from Australia", *Journal of Business Finance and Accounting,* Vol. 36 No.1/2, pp. 51-72.

Habib, A. (2006), "Information risk and the cost of capital: review of the empirical literature", *Journal of Accounting Literature,* Vol. 25, pp. 127-168.

Healy, P. M. and Wahlen, J. M. (1999), "A review of the earnings management literature and its implications for standard setting", *Accounting Horizons,* Vol. 13 No. 4, pp. 365-383.

Hribar, P. and Collins, D. W. (2002), "Errors in estimating accruals: implications for empirical research", *Journal of Accounting Research,* Vol. 40 No. 1, pp. 105-134.

Jaggi, B. and Lee, P. (2002), "Earnings management response to debt convenant violations and debt restructuring", *Journal of Accounting, Auditing and Finance,* Vol. 17, pp. 295-324.

Jensen, M. and Meckling, W. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics.* Vol. 3 No. 4, pp. 305-360.

Jones, J. J. (1991), "Earnings management during import relief investigations", *Journal of Accounting Research,* Vol. 29 No. 2, pp. 193-228.

Karjalainen, J. (2011), "Audit quality and cost of debt capital for private firms: evidence from Finland", *International Journal of Auditing*, Vol. 15, pp. 88-108.

Kim, J. B., Simunic, D. A., Stein, M. T. and Yi, C. H. (2011a), "Voluntary audits and the cost of debt capital for privately held firms: Korean evidence", *Contemporary Accounting Research*, Vol. 28 No. 2, pp. 585–615.

Kim, J. B., Song, B. and Tsui, J. L. (2013), "Auditor size, tenure, and bank loan pricing", *Review of Quantitative Finance and Accounting*, Vol. 40 No. 1, pp. 75–99.

Kim, J. B., Tsui, J. L. and Yi, C. H. (2011b), "The voluntary adoption of International Financial Reporting Standards and loan contracting around the world", *Review of Accounting Studies*, Vol. 16 No. 4, pp. 779–811.

Kothari, S. P., Leone, A. J. and Wasley, C. E. (2005), "Performance matched discretionary accrual measures", *Journal of Accounting and Economics*, Vol. 39 No. 1, pp. 163-197.

Lev, B. (1989), "On the usefulness of earnings and earnings research: lessons and directions from two decades of empirical research", *Journal of Accounting Research,* Vol. 27, pp. 153-192.

Maijoor, S. J. and Vanstraelen, A. (2006), "Earnings management within Europe: the effects of member state audit environment, audit firm quality and international capital markets", *Accounting and Business Research*, Vol. 36 No. 1, pp. 33-52.

Martins, O. R. S. and Moreira, J. A. C. (2009), "Endividamento bancário e qualidade da informação financeira: um estudo para o caso português", *Jornal de Contabilidade da APOTEC*, No. 388, pp. 217-231.

Mayoral, J. M. and Segura, A. S. (2009), "Cómo afectan los impuestos a la calidad del resultado? Evidencia empírica en las empresas españolas no cotizadas", *Revista de Contabilidad,* Vol. 12 No 1, pp. 117-140.

Mazumdar, S. C. and Sengupta, P. (2005), "Disclosure and the loan spread on private debt", *Financial Analysts Journal*, Vol. 61No. 3, pp. 83-95.

McNichols, M. F. (2002), "Discussion of 'The quality of accruals and earnings: the role of accrual estimation errors'", *Accounting Review,* Vol. 77, pp. 61-69.

Moreira, J. A. C. (2006), "Are financing needs a constraint to earnings management? Evidence for private Portuguese firms", CETE discussion paper, Faculty of Economics of University of Porto.

Minnis, M. (2011), "The value of financial statement verification in debt financing: evidence from private U.S. firms", *Journal of Accounting Research*, Vol. 49 No. 2, pp. 457-506.

Nikolaev, V., and van Lent, L. (2005), "The endogeneity bias in the relation between cost-of-debt capital and corporate disclosure policy", *European Accounting Review,* Vol. 14 No. 4, pp. 677-724.

Noguer, B. G. A. and Muñoz, M. I. (2007), "La calidad de los ajustes por devengo no afecta al coste de la deuda de las PYMES españolas", *Investigaciones Economicas,* Vol. 31 No. 1, pp. 79-117.

Othman, H. B. and Zeghal, D. (2006), "A study of earnings-management motives in the Anglo-American and Euro-Continental accounting models: The Canadian and French cases", *The International Journal of Accounting,* Vol. 41 No. 4, pp. 406-435.

Petersen, M. A.(2009), "Estimating standard errors in finance panel data sets: comparing approaches", *The Review of Financial Studies*, Vol. 22 No. 1, pp. 435-480.

Pittman, J. A. and Fortin, S. (2004), "Auditor choice and the cost of debt capital for newly public firms", *Journal of Accounting and Economics*, Vol. 37, pp. 113–136.

Schipper, K. (1989), "Earnings Management", *Accounting Horizons,* Vol. 3 No. 4, pp. 91-102.

Schipper, K. and Vincent, L. (2003), "Earnings quality", *Accounting Horizons,* Vol. 17, pp. 97-110.

Shivakumar, L. (2013), "The role of financial reporting in debt contracting and in stewardship", *Accounting and Business Research.* Vol. 43 No. 4, pp. 362-383.

Smith, C. W. and Warner, J. B. (1979), "On financial contracting: an analysis of bond covenants", *Journal of Financial Economics.* Vol. 7 No. 2, pp. 117-161.

Valipour, H. and Moradbeygi, M. (2011), "Corporate debt financing and earnings quality", *Journal of Applied Finance & Banking*. Vol. 1 No. 3, pp. 139–157.

Wooldrigde, J. M. (2002), *Econometric Analysis of Cross-Section and Panel Data*, Massachusetts: MIT Press.

Yee, K. K. (2006), "Earnings quality and the equity risk premium: a benchmark model", *Contemporary Accounting Research,* Vol. 23 No 3, pp. 833-877.

Zeff, S. A. (1978), "The rise of 'economic consequences'", *The Journal of Accountancy,* Vol. 146 No 6, pp. 56-63.

Table 1 – Sample selection

	N.º of firm-year observations
Companies available for the 1998-2007 period, having total assets larger than 1 M€, after excluding: companies with negative equity; financial, real estate and public institutions; and listed companies.	169.290
Observations after imposing the restrictions associated with the calculation of the cost of debt (*INT*) and the earnings quality (*EQ*) variables	12.569
Final working sample, after the estimation of the remaining variables of the model [1] for the period 2001-2007	**10.283**

Table 2 – Descriptive statistics

	Mean	Q25%	Median	Q75%
INT (%)	11,10	6,21	8,68	12,9
EQ	-0,03	-0,01	-0,02	-0,04
IC	4,60	1,72	2,96	5,25
LIQ	1,35	1,00	1,22	1,54
COL	0,29	0,14	0,25	0,41
LEV	0,68	0,59	0,70	0,78
SIZE	8,77	8,02	8,62	9,36

	N.º of firm-year observations
Audited financial statements	6.237
Unaudited financial statements	4.046

Notes: number of observations: 10.283; period: 2001 to 2007; *INT*: cost of debt estimated as the ratio of interest expense to the average interest bearing debt; *EQ*: earnings quality measured by the symmetrical of the absolute value of abnormal accruals estimated by the Dechow and Dichev (2002) model with the modification introduced by McNichols (2002); *IC*: interest coverage ratio estimated as EBITDA divided by interest expense; *LIQ*: liquidity ratio estimated as current assets divided by current liabilities; *COL:* proxy for collateral calculated as PPE divided by total assets; *LEV*: leverage ratio calculated as total debt divided by total assets; *SIZE:* firm size measured as the natural log of total assets.

Table 3 – Pearson correlations

	INT	*EQ*	*IC*	*LIQ*	*COL*	*LEV*	*SIZE*
INT	1						
EQ	-0,0561***	1					
IC	-0,1402***	-0,0384***	1				
LIQ	0,0146	0,0029	0,0584***	1			
COL	-0,1973***	0,0073	0,0963***	-0,2694***	1		
LEV	0,0199**	0,0071	-0,2189***	-0,3331***	-0,1604***	1	
SIZE	-0,0775***	0,0497***	0,0384**	0,0569***	0,0041	-0,0489***	1

Notes: ***, **, and * denotes statistical significance at 1%, 5% and 10% levels, respectively; variables definition as per Table 2.

Table 4 – OLS regression results for testing hypothesis 1

		Model [1]	**Model [2]**
	Expected sign	Coefficient *(t statistic)*	Coefficient *(t statistic)*
Constant	?	0,2184*** *(11,13)*	0,1872** *(7,85)*
DSize	-	-	-0,0110* *(-1,90)*
EQ	-	-0,1853*** *(-2,64)*	-0,1892* *(-1,84)*
*DSize*EQ*	-	-	0,0060 *(0,05)*
IC	-	-0,0012*** *(-3,36)*	-0,0012*** *(-3,40)*
LIQ	-	-0,0064*** *(-4,14)*	-0,0063*** *(-4,08)*
COL	-	-0,0902*** *(-10,85)*	-0,0901*** *(-10,85)*
LEV	+	-0,0324*** *(-3,05)*	-0,0326*** *(-3,06)*
SIZE	-	-0,0055*** *(-3,06)*	-0,0013 *(-0,50)*
Year dummies	?	Yes	Yes
Industry dummies	?	Yes	Yes
Adjusted R^2		8,27%	8,43%
F-statistic		25,08***	24,30***

Notes: ***, **, and * denotes statistical significance at 1%, 5% and 10% levels, respectively; number of observations: 10.283; period: 2001 to 2007; *DSize* takes the value 1 when the firm's total assets are above the sample median and the value 0 otherwise; definition of the remaining variables as per Table 2; *t-statistic* in brackets are based on robust standard errors clustered by firm (Petersen, 2009).

Table 5 – OLS regression results for testing hypothesis 2

Model [3]				
		Coefficient *(p-value)*		Difference in coefficients *(p-value)*
	Expected sign	Audited Financial Statements	Unaudited Financial Statements	
Constant	?	0,1901*** *(0,0000)*	0,2878*** *(0,0000)*	-0,0977*** *(0,0000)*
EQ	-	-0,2360*** *(0,0000)*	-0,1157** *(0,0145)*	-0,1203** *(0,0405)*
IC	-	-0,0010** *(0,0120)*	-0,0015*** *(0,0000)*	0,0005** *(0,0313)*
LIQ	-	-0,0051*** *(0,0066)*	-0,0078*** *(0,0001)*	0,0027 *(0,3258)*
COL	-	-0,0879*** *(0,0000)*	-0,0899*** *(0,0000)*	0,0020 *(0,8333)*
LEV	+	-0,0310*** *(0,0003)*	-0,0348*** *(0,0014)*	0,0038 *(0,7816)*
SIZE	-	-0,0030*** *(0,0051)*	-0,0132*** *(0,0000)*	0,0102*** *(0,0000)*
Year dummies	?	Yes	Yes	
Industry dummies	?	Yes	Yes	
Adjusted R^2		8,56%		
F-statistic		21,89***		

Notes: ***, **, and * denotes statistical significance at 1%, 5% and 10% levels, respectively; number of observations: 10.283; period: 2001 to 2007; definition of variables as per Table 2; *p-values* in brackets are based on robust standard errors clustered by firm (Petersen, 2009). The statistical significance of the constant and the coefficients of the variables in companies with audited financial statements were assessed using the Wald test. The difference between the coefficients of variables in both types of companies was also evaluated based on the Wald test.

Table 6 – OLS regression results for testing hypothesis 3

	Model [4]	
	Expected sign	Coefficient *(t statistic)*
Constant	?	0,2419*** *(10,21)*
DLev	-	-0,0100** *(-2,08)*
EQ	-	-0,1853* *(-1,84)*
*DLev*EQ*	?	-0,0025 *(-0,02)*
IC	-	-0,0012*** *(-3,39)*
LIQ	-	-0,0068*** *(-4,41)*
COL	-	-0,0903*** *(-10,85)*
LEV	+	-0,0602*** *(-3,80)*
SIZE	-	-0,0055*** *(-3,70)*
Year dummies	?	Yes
Industry dummies	?	Yes
Adjusted R^2		8,39%
F-statistic		24,16***

Notes: ***, **, and * denotes statistical significance at 1%, 5% and 10% levels, respectively; number of observations: 10.283; period: 2001 to 2007; *DLev* that takes the value 1 when the debt (*LEV*) is below the median of the sample and the value 0 otherwise; definition of the remaining variables as per Table 2; *t-statistic* in brackets are based on robust standard errors clustered by firm (Petersen, 2009).