The effect of auditor quality and ownership structure on the debt maturity of AIM firms

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ABSTRACT

The aim of this paper is to analyze the effect of two corporate governance mechanisms that might affect the debt maturity structure of listed firms on the Alternative Investment Market (AIM): the use of the services provided by a Big 4 auditor and the firms' ownership structure. Analyzing a sample of 330 firms during the period 1998-2016 and applying both cross-sectional and panel data estimations, we find that: i) there is a positive and significant relationship between being audited by a Big 4 auditor and debt maturity, which is reflecting lower agency conflicts within these firms; ii) firms with more ownership concentration have a higher fraction of long term debt in their capital structure; iii) while family firms are, on average, associated with shorter debt maturities, when they are audited by a Big4 their debt maturity lengthens. In the paper we discuss this complementarity effect of Big4 auditor and ownership structure. Results are robust when we control for the possible endogeneity problem of the Big 4 auditor choice. We also find that the effect of Big 4 auditor and the ownership structure on debt maturity is conditioned by firm size.

Key Words: Audit quality – Ownership structure - Debt maturity structure – Alternative Investment Market (AIM).

JEL Codes: G15; G30; G32; M42.

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1. Introduction

Past research on financial decisions has focused on the optimal amount of debt and equity in a firm's capital structure and agency cost theories have been proposed in this context (Jensen and Meckling, 1976; Fama and Jensen, 1986). Firms' financial decisions are also related to the information available between firms and their investors (Arslan and Karan, 2006; Chan et al., 2009). Corporate governance (CG) attributes ensure the integrity of financial results and the transparency and reliability of the information for all firms' members and for the well-functioning of the capital markets (DeAngelo, 1981; Chan et al., 2009, among others). This paper focuses on the effect of two of these attributes on debt maturity: the auditor's quality and the firms' ownership structure.

External auditors play a relevant role in mitigating agency conflicts, even more if we take into account the quality of their services. Large international and prestigious auditing firms, currently knowing as Big 4[2], have more power to litigation and they offer a higher quality of services. Big 4 auditors help to mitigate agency conflicts between managers and shareholders and to reduce information asymmetries.[3] Also, the ownership structure of the firms conditions their agency conflicts between managers and shareholders. A large shareholder or concentrated ownership structures can act as corporate control mechanisms to reduce the conflict of interest between insiders and outsiders (Shleifer and Vishny 1986). Therefore, a positive association between ownership concentration and debt maturity might emerge (Martins et al., 2017).

For Small and Medium Enterprises (SMEs) in particular, the disclosure of the quality of financial information is a basic pillar of good CG practices to make financing easier, given that these firms are more affected by asymmetric or incomplete information, which limits their access to external funds. SMEs are usually not listed on capital markets[4]. An important and early exception is the Alternative Investment Market (AIM) in the London Stock

[2] Big4 auditors are KPMG, Deloitte, PricewaterhouseCoopers and Ernst & Young.

[3] Some research supports the contention that strong institutions at country level are a necessary condition for generating differential audit quality at the firm level (Francis and Wang, 2008; El Ghoul et al., 2016). In contrast, others find that the role of Big 4 auditors improving transparency is concentrated in countries with weak legal institutions (Fan and Wong, 2005; Choi and Wong, 2007; Choi et al., 2008; Kim et al., 2011).

[4] SME financing via capital markets is still very small, except for the two pioneer countries, the UK and Canada, in opening alternative investment markets for SMEs. There are from 2 to 48 listed firms in Latin American, non-OECD countries, and from 14 to 187 listed firms in OECD countries (Briozzo, et al., 2017).

Exchange (UK). It was stablished in 1995 and currently large and SMEs firms from 100 different countries are listed on it[5]. The AIM operates under a self-regulated environment where the application of some standards is voluntary (Feito-Ruiz et al., 2016). AIM firms are not obliged to apply the Combined Code on CG as these firms are not considered as belonging to the main market (Mallin and Ow-Yong, 1998, 2012). Based on the Combined Code (1998, 2008), the standards for the AIM listed firms have been published including: i) *Quoted Companies Alliance (QCA)* (2005) and ii) *AIM Rules for companies LSE*, especially Rule 26 (February, 2007). An updated website is required with CG information (directors, auditors and board, without specifying the level and quality of the information). It is expected that the increase of regulation could reduce managerial discretion, providing the market with more information.[6]

Previous literature has studied the auditor quality choice on firms' financial decisions (Fan and Wong, 2005; Chang et al., 2009; Beisland et al., 2015; Van Caneghem and Van Campenhout, 2010; Niskanen, et al., 2010; Kim et al., 2011; Karjalainen, 2011; El Ghoul et al., (2016); Robin, et al., 2017, among others), and the ownership structure and its impact on the debt-maturity structure (Arslan and Karan, 2006; Mande et al., 2012). Likewise, earlier studies have focused on the determinants of choosing a Big 4 auditing firm (Fan and Wong, 2005; Chang et al., 2009; Beisland et al., 2015; Van Caneghem and Van Campenhout, 2010; Niskanen, et al., 2010; Kim et al., 2011; Karjalainen, 2011; El Ghoul et al., 2016; Robin et al., 2017, among others). These studies focus mainly on large and listed firms[7]. As far as we know, there is no any previous study which analyzes the impact of both audit quality choice and ownership structure on the debt maturity of large and SMEs firms listed on alternative investment markets (as the AIM is). Given the lack of research about these topics, the main objective of this paper is to cover this gap by answering the following research questions:

- *How does the presence of Big 4 auditors affect the debt maturity of AIM firms?*

[5] http://www.londonstockexchange.com/companies-and-advisors/aim/aim/aim.htm

[6] The new *European Auditor Law (2014/56/UE)* establishes that firms have to change their auditor each ten year in order to fulfill the CG standards. Firms listed on the alternative investment markets have more flexibility, so they could make decisions in relation to the auditors with the aim of being more transparent and increasing the quality of the financial information, as well as mitigating the agency conflicts.

[7] With the exception of Farag, Mallin and Ow-Young (2014) who studied the influence of the ownership structure of the Venture Capital funds.

- *How does the ownership structure affect the debt maturity of AIM firms?*
- *Are Big 4 auditors and ownership structure substitute or complementary corporate control mechanism for AIM firms?*
- *Is the effect of Big 4 auditors and ownership structure on debt maturity similar or different for large and SME's AIM firms?*

This study contributes to the literature in the following ways. First, unlike previous studies, we analyze the debt maturity of firms listed on an alternative investment market, as the AIM is. Second, we consider the joint effect of auditor quality and ownership structure on debt maturity. Third, we compare possible differences depending on the firms' size.

The paper is organized as follows. Section 2 presents previous research. Section 3 describes the data and methodology used. Section 4 shows the main results. Section 5 presents the main conclusions and implications.

2. Previous Research

2.1 Audit Quality Choice and debt maturity structure

Fan and Wong (2005), using a broad sample from eight East Asian emerging economies, show that those firms which have severe agency problems (conflicts of interest between controlling owners and the minority shareholders) are more likely to choose a Big 4 auditor firm. The main role of external auditors is to enforce the application of accounting rules. Their opinions have impact on both external and internal users of financial statements: i) for lenders, the fact that debtor firms are clients of a Big 4 could protect their interests against the strict control they have (El Ghoul, et al., 2016). Being a client of a Big 4 provides firms with the possibility of obtaining financing at a lower cost since lenders are willing to reduce monitoring costs by having to carry out fewer checks every time, even more if the loan expires in the short term (Diamond 1991; Graham et al., 2008; Kim et al., 2011; El Ghoul, et al., 2016) ii) for shareholders, they are more willing to stay, or increase their investment if the company in which they have invested is a client of a Big 4. This fact inspires confidence and, therefore, they perceive that their interests are well protected.

Chang et al. (2009) provide empirical evidence that higher quality of auditors reduces the impact of market conditions on client's financial decisions and capital structure. The authors find that firms audited by a Big 4 firm are more likely to issue equity, while those firms audited by a non-Big 4 firm are more likely to issue debt. The first group of firms are able to

make larger equity issues than are those audited by a non-Big 4 firm, but the difference narrows when the market conditions improve. Mande et al. (2012) examine whether CG mechanisms plays a role in influencing a firm's choice of financing. The authors hypothesize that the likelihood of equity financing increases with better corporate governance because of a reduction in agency costs between investors and managers in these firms. They find that firms will issue equity as their last resort because of the high information asymmetry associated with equity financing. Van Caneghem and Van Campenhout (2010) find that both the quantity and quality (i.e. auditing services provided by a Big 4 firm has been considered as a proxy for audit quality) of financial statement information are positively related to Belgian SMEs' leverage. They also find that leverage is positively related to asset structure, growth (prospects) and industry leverage, but it is negatively related to firm age and profitability.

Kim et al. (2011), using a sample of private Korean firms with either no audit or voluntary audits, provide evidence of the value of an external audit in the pricing of private debt. They find that private companies with voluntary audits pay significantly lower interest rates on their debt than private companies with no audit. Karjalainen (2011) analyze the relevance of the perceived audit quality as well as the audit outcomes, in the pricing of debt capital for privately held Finnish firms. The results show that privately held firms with Big 4 audits and those with multiple auditors have a lower cost of debt capital than other firms. El Ghoul et al. (2016) study the importance of Big 4 auditors reducing agency costs in corporate debt-maturity worldwide. They find that the long-term debt ratio increases with the presence of a Big 4 auditor, "*suggesting that higher-quality of auditors substitute short-term debt for monitoring purposes*". Robin et al. (2017) find that high-quality auditors encourage more favorable debt covenant terms and, thereafter, reduce the probability of covenant violations. This complements the previous literature showing that high-quality auditors decrease the overall cost of the debt.

2.2 Ownership structure and debt maturity structure

Arslan and Karan (2006) analyze the ownership and control structure as determinants of debt maturity structure for a sample of Turkish industrial firms listed on the Istanbul Stock Exchange in the period 1997-2003. The main findings show that both concentrated ownership structure and the presence of a large shareholder is directly related to corporate debt maturity.

Despite having a controlling large shareholder or a concentrated ownership structure, firms with growth opportunities still prefer shorter maturities in order to solve the underinvestment problems. Finally, firm size is positively associated with long-term debt. Diaz-Díaz et al., (2016) analyze a sample of 4,365 unlisted Spanish large and SMEs firms (from 2004 to 2013). They study the effect of family control on the debt maturity structure. The authors find that the family firms get better access to long-term debt, even when exercising control by pyramid structures. However, the existence of a second largest family group has a negative effect on the debt maturity structure. They also find that those firms which have fewer growth opportunities, higher asset maturity and more leverage, use more long-term debt, as previous studies show.

On the other hand, previous studies also focus on the influence of ownership structure on the Big4 auditor choice. Niskanen et al. (2010) show that Finnish family firms or firms with more concentrated ownership structure are less likely to use Big 4 auditors than non-family firms or firms with less-concentrated ownership. Hsu et al. (2017), using a sample of listed firms on the Taiwan Stock Exchange from 1996 to 2015, investigate whether family firms and control configurations are systematically associated with a firm´s choice of auditor, from an agency perspective. Despite the presence of two distinct types of agency effects (alignment effect and entrenchment effect), regardless of differences in family ownership and control configurations, none of these firms are inclined to appoint higher-quality auditors.

Taking into account previous arguments Big 4 auditors and ownership structure could have a substitute or complementary effect on debt maturity and an endogenous problem might emerge in relation to the choice of a Big 4 auditor on the debt maturity.

3.- Data and methodology

3.1 Data collection and sample

We analyze a sample of 330 firms listed on the London Stock Exchange's AIM over the period 1998-2016. AIM provides a wide range of businesses (at different stages of development, from early stage (e.g. Venture Capital-backed) to more established ones) the opportunity to access capital to pursue their growth ambitions and raise their international profile. Since its launch in 1995, more than 3,000 companies across all sectors have been

admitted to AIM, raising a total of £92 billion (£40 billion at IPO and £52 billion in further capital fundraisings) and with an average market capitalization that grew from £8.2 million in 1995 to £70 million in 2015. It has been estimated that the overall economic impact of UK AIM companies is equivalent to £25 billion in GDP and some 731,000 jobs (LSE, AIM 20 key statistics, 2017)[8]. AIM's balanced regulatory regime was designed specifically for growing SMEs. Indeed, companies joining AIM have to bear lower costs and less regulatory requirements than what is required in other regulated markets and are not required to have a particular financial track record or trading history.

We initially extracted a total of 971 firms listed on the AIM market over the period 1998-2016 from the LSE website. From this initial sample, we excluded those firms lacking the Stock Exchange Daily Official List (SEDOL) code, without which it was not possible to match accounting and ownership information. The data on auditors, ownership and financials were derived from commercial databases, such as Capital IQ (for auditors and board data), Datastream (for accounting information) and Amadeus (for ownership information). Following previous studies (Arslan and Karan, 2006; Billet et al., 2007; El Ghould et al., 2016), we excluded from the sample financial firms (SIC industry codes: 6000-6999) whose debt maturity structure is not comparable with industrial firms and other service firms. The final sample consists of 2,609 firm-year observations, representing 330 firms listed on the AIM over the period 1998-2016. Out of 330 firms, 57.8% can be considered as SMEs (with less than 250 employees). Table 1A in the Appendix shows the distribution by sector of sample firms. Firms operating in the service sector represent 45.16% (of which 24.24% are Business Service firms). Manufacturing firms mainly belong to the Oil and Gas Extraction (6.97%), Metal Mining (6.97%), Electronic & Other Electrical Equipment (6.97%), followed by Chemicals (5.45%) and Medical & Optical Goods (5.15%).

3.2 Variables and descriptive statistics

Table 1 reports the definition of the variables used in the empirical analysis, together with the data source. Table 2 (Panel A) illustrates the main descriptive statistics (mean, median, standard deviation, minimum and maximum). Table 2 (Panel B) illustrates the

[8] https://www.lseg.com/markets-products-and-services/our-markets/london-stock-exchange/equities-markets/raising-equity-finance/aim/aim-20/aim20-key-statistics

results of a t-test of differences conducted to statistically compare the means of the considered variables between two groups of firms: firms audited by a Big 4 auditing firm and firms not audited by a Big 4. Panel C provides the mean comparison t-test by disentangling also among different size sub-samples. Table 4A in the Appendix reports the pairwise correlation matrix. All variables are winsorized using a 1% cut-off for each tail to reduce the impact of outliers (Dixon, 1960). Variables are assigned the values corresponding to the 1st and 99th percentiles of their distribution to all observations that fall beyond them.

[Insert Tables 1-2 here]

The dependent variable is DEBT MATURITY. We use the long-term debt ratio (long-term debt/total debt) to gauge the debt maturity structure of analyzed firms (Arslan and Karan, 2006; Demirgüç-Kunt and Maksimovi, 1999; Custódio et al., 2013; El Ghoul et al., 2016 among others). Debts of more than one-year maturity are classified as long-term debts. The average incidence of the long-term debt is 52% for the overall sample. Debt maturity has a mean value of 0.58 for firms audited by a Big 4 auditor and 0.48 for those not audited by a Big 4 auditor. This difference is statistically significant at 1% significance level, indicating that firms with a Big 4 auditor have indeed a higher incidence of long term debt over total debt, as we expected. If we consider the subsample of micro, small, medium and large firms, we observe that this difference is just significant for the subsample of large firms.

Our main independent variables of interest include measures of audit quality and ownership structure, as tools to reduce agency costs. Agency costs arise from the separation of ownership and control and they affect debt maturity. Lenders prefer short term debt for firms with more conflict of interest between managers and shareholders. Audit quality is proxied by whether the firm is audited by one of the worldwide largest audit firms, currently called the Big 4. Following prior research (Chan et al., 2009; Kim et al., 2011), we use a dummy variable, which takes the value of one if the firm is audited by a Big 4 auditing firm and zero otherwise (BIG 4). Overall, 30% of sample firms are audited by Big 4 firms. In order to test the effect of ownership structure on debt maturity, we introduce alternative measures of ownership structure and concentration. OWNERSHIP_MAIN_SH is the percentage of ownership held by the major shareholder. On average, the largest shareholder in our sample firms holds 20% of the shares. Faccio and Lang (2002) argue that it is sufficient for the largest shareholder to hold at least 20% of the shares to have an effective control over

the company. CONCENTRATION is the sum of the ownership percentages of the largest three shareholders. Alternatively, CONCENTRATION25 is a dummy variable that is equal to 1 if the top three shareholders hold more than twenty-five percent of the ownership. On average, the cumulative percentage of shares owned by the three largest shareholders is 40% and it is more than 25% for 77% of our sample. CONCENTRATION is lower when the auditor is a Big 4 (38%) than when it is a non-Big 4 (40%), this difference being statistically significant at 10% level.

Note that shareholders are classified into four groups: (i) an individual or family, (ii) institutional investors (including financial firms), (iii) non-financial firms, (iv) others. This distinction allows us to specify different variables for different types of ownership. We introduce the variable MAIN_SH25_FAM, which is a dummy variable equal to 1 if the largest shareholder is a family member and holds more than 25% of the ownership. We also run our models with other specifications of family ownership. OWNERSHIP_FAM denotes the percentage of family ownership in the firm by the largest shareholder (holding more than 25% of ownership). BLOCK_FAM is a dummy variable that is equal to 1 if the top three shareholders are family members and hold (in sum) more than 25% percent of the firm ownership. Similarly, when shareholders are institutional investors, we have the following variables: MAIN_SH25_INV (dummy equal to 1 if the largest shareholder is an institutional investor and holds more than 25% of the shares), OWNERSHIP_INV denotes the percentage of institutional investors' ownership in the firm by the largest shareholder (holding more than 25% of ownership) and BLOCK_INV (dummy equal to 1 if the top three shareholders are institutional investors and hold in sum more than 25% percent of the shares). When shareholders are companies, we defined the variables MAIN_SH25_COMP (dummy equal to 1 if the largest shareholder is a company and holds more than 25% of the ownership), OWNERSHIP_COMP denotes the percentage of company ownership in the firm by the largest shareholder (holding more than 25% of ownership) and BLOCK_COMP (dummy equal to 1 if the top three shareholders are companies and hold in sum more than 25% percent of the ownership). Table 2 illustrates that 11% of sample firms are held by a family with more than 25% of ownership. This value is lower (8%) for the sub-sample of firms not audited by a Big 4 auditing firm than for the sub-sample of firms audited by a Big 4 (12%). The t-test rejects the null hypothesis of equal means in the value between the first and the

second sub-sample at the 5% significance level. This result is consistent with the fact that family firms could be more reluctant to hire Big 4 auditors (Niskanen et al., 2010). On average, the three-top shareholders are family members with more than 25% of ownership for the 20% of the sample. This percentage is lower, 13%, for the sub-sample of firms audited by Big 4, while it is 23% for firms audited by non-Big 4 auditors. The t-test rejects the null hypothesis of equal means in the value between first and the second at 1% significance level. However, when the three top shareholders are institutional investors the opposite is observed, being the percentage higher (38%) for the sub-sample of firms audited by Big 4 auditors than for firms audited be non-Big 4 (27%). This difference is also statistically significant at the 1% level.

We included a number of controls at firm-level in our estimates that, according to previous studies, may contribute to explain firms' debt maturity. We computed leverage (LEV) as total debt divided by total assets and the mean value is 0.22. As a measure of profitability, we computed return on assets (ROA), defined as EBITDA divided by the book value of total assets. Table 2 (panel A) shows that, on average, the ROA for sample firms is negative and takes the value of -0.03, this being positive and higher for firms audited by Big 4 auditing firms (0.013) than for firms audited by non-Big 4 auditing firms (-0.05). This difference is statistically significant at 5% level. EARN_VOLATILITY is defined as the standard deviation of the EBITDA to total assets, showing an average value of 47%. The volatility of firm earnings is significantly higher, on average, for those firms audited by non-Big 4 firms (57%) compared to that reported for the Big 4 sample (21%). TANG is a variable that reflects the incidence of tangible assets over total assets. On average, tangible assets represent the 72% of total assets, being this ratio higher for those firms audited by Big 4 (74%) than non-Big 4 (71%). Also in this case the difference is statistically significant.

We also control for firm size and firm age. Typically, larger firms face lower information asymmetries, which can facilitate long-term debt financing (Titman and Wessels, 1988). We therefore expect that size is positively related to debt maturity. Empirical studies generally support this expected relationship (e.g. Datta, Datta and Raman 2005; Marchica, 2008). However, other studies have found the opposite effect (Scherr and Hulburt, 2001). SIZE is measured in the regression analysis as the logarithm of total assets. The mean value of total assets for sample firms is £69,381 million When we compare firms audited by Big 4 auditors

and non-Big 4, we observe that the mean of total assets is higher for the sub-sample of firms audited by a Big 4, which takes the value of £134,710.9 million, being this value £41,825.08 million for non-Big 4 subsample. The difference in the means between the two groups is significant at the conventional levels, which is consistent with the argument that larger firms may suffer more of agency conflicts and thus have more incentives to hire Big 4 auditing firms in order to settle them. AGE is measured as the log of the firms' age plus one (Chang et al., 2009) in the regressions. This variable, which is used to control for the firm's level of experience and accumulated resources, is expected to exert a positive influence on the long-term debt (Scherr and Hulburt 2001). Table 2 shows that AIM firms are on average 26.6 years old and that firms audited by Big 4 companies are older (34.4 years) than those audited by non-Big 4 companies (23.3 years). Again, this difference is statistically significant at 1% significance level.

We also control for the financial strength and for the growth opportunities of sample firms. Growth opportunities are proxied by the Market-to-Book ratio (MARKET-TO-BOOK), which compares the company's current market value to its book value. When the market recognizes the value of firms' growth opportunities, the Market-to-Book ratio should be higher than 1. The average Market-to-Book ratio for AIM companies is 1.74. Following Arslan and Karan (2006), Graham (1996) and Jun and Jen (2003) we employ the Altman Z-score to measure firms' financial strength (see Table 1 for a description of the way it is calculated). We define a binary variable FINANC_STRENGTH that takes the value of one if the firm reports an Altman (1968) Z-score higher than 2.99 and 0 otherwise[9]. We expect that firms showing less financial problems (higher Z-score values) may reduce their debt maturity (Arslan and Karen, 2006). Table 2 (panel A) shows that, on average, 8% of sample firms can be considered as financially strong firms.

Lastly, when running two-stage regressions, we included as additional determinants of the probability to be audited by a Big 4 firm, the size of the board of directors and the number of years the firm is relying on the auditing firm service. The variable BOARD_SIZE is defined as the number of directors in the board[10]. Larger boards can force managers to choose a debt

[9] We apply the same threshold used by Altman (1968): if the value of the Z score is above 2.99, the company is placed in the "Safe Zone", being lower the risk that it falls into financial distress.

[10] This variable does not vary over time, because of the lack of information over the years.

maturity structure that facilitates frequent monitoring (Harford et al., 2008). On average, AIM firms have 6.18 directors on the board (Table 2, panel A). AUDIT_TENURE is the number of years the audit company is auditing the firm. While on average, auditing firms provide their service to sample firms for 8.12 years, firms audited by Big 4 present a higher value (9.35) than those audited by a non-Big 4 (7.60). This difference is statistically significant at 1% level (Table 2, panel B). In all model specifications we control for the firms' industrial sector.

To conclude, from the descriptive statistics we observe that firms with Big 4 auditors present a higher debt maturity, they are less likely to be family firms, they have a greater size by assets, they are older, they are more profitable, they have more tangible assets, a lower earnings volatility and the tenure of their auditors is higher.

4.- Main results and discussion

Table 3 illustrates the effect of auditors' choice and ownership structure on debt maturity using Ordinary Least Squares (OLS). Model 1 is the baseline model and includes the BIG 4 variable and firms' characteristics as controls, as well as industry and year dummies. In Model 2 we test the effect of the percentage of ownership held by the major shareholder and of its squared value (OWNERSHIP_MAIN_SH and OWNERSHIP_MAIN_SH_SQ). In Models 3 and 4 we include, respectively, the variables CONCENTRATION and CONCENTRATION25. In Model 5, we distinguish between different types of shareholders: family firms (MAIN_SH25_FAM), institutional and company shareholders (MAIN_SH25_INV and MAIN_SH25_COMP)[11].

The Big 4 variable has a positive and significant effect on debt maturity in all model specifications (at 1% and 5% significance levels), indicating that being audited by well-known auditors could reduce agency conflicts, thus increasing the debt maturity. This result is in line with El Ghoul et al. (2016), among others. Concerning ownership variables, Model 2 shows that there is a curvilinear effect of the variable OWNERSHIP_MAIN_SH. Lower levels of ownership held by the main shareholder are associated with a lower debt maturity, but this effect is not statistically significant. However, higher levels of ownership held by the

[11] We estimated the same models by including only the variable financial strength, without the other controls. The results are similar to those shown in Table 3 and are available upon requests.

main shareholder have a positive and significant effect on debt maturity (at 5% significance level). The turning point is reached at 28.92%, which is consistent with a reduction of agency conflicts in firms with a concentrated ownership structure by establishing a monitoring mechanism of managers to make value-maximizing financing choices. CONCENTRATION25 has a positive and significant effect (at 5% significance level) on debt maturity, which is consistent with the argument that a higher ownership concentration reduces agency conflicts and contributes to lengthen debt maturity. This effect is evident when the variable MAIN_SH25_COMP is considered. Instead, we observe that when the largest shareholder is a family member and holds more than 25% of the ownership, debt maturity is lower, which is in line with the preference of family firms for short-term debt.

Concerning the controls, firm's leverage (LEV) is positively and significantly associated with debt maturity, because higher indebted firms may borrow on longer terms due to their higher liquidity risk (Diamond, 1991). Firm size (SIZE) positively affects the fraction of long-term debt in a firm's capital structure, which is consistent with the argument that larger firms face lower information asymmetries, which can facilitate long-term debt financing (Titman and Wessels, 1988). Firms' financial strength (FINANC_STRENGTH) has a negative impact on debt maturity, meaning that such firms are less affected by the risks of short-term debt (Arslan and Karan, 2006). Moreover, as firms get financially strong, they may shorten their corporate debt maturity, as predicted by signaling arguments, which predict that good quality firms prefer shorter-term debt.

[Insert Table 3 here]

In Table 4 we include the interaction term between Big 4 and the ownership structure variables used in previous models in order to analyze whether these two tools are complementary or substitute corporate governance mechanisms. In Model 1, the interaction between Big4 and OWNERSHIP_MAIN_SH (and its squared term) is positive but not statistically significant. The interaction between Big4 and CONCENTRATION (Model 2) has a positive and significant effect on debt maturity (at 5% level), meaning that when companies display higher levels of ownership concentration and are audited by a Big4 agency conflicts are reduced. In Model 4 the interaction term between Big 4 auditor and family firms (BIG 4*MAIN_SH25_FAM) is positive and significant at 1% level, being the individual variable on family firms negative, as in previous models. This result seems to indicate that

while family firms are, on average, associated with shorter debt maturities, if they are audited by a Big 4 their debt maturity lengthens. The interaction term between BIG 4 and institutional investors is also positive and significant (BIG 4*MAIN_SH25_INV). Therefore, based on these results, we can assume that a complementary effect between Big4 auditor and ownership concentration exists, even when the type of shareholder is a family firm.

[Insert Table 4 here]

These effects are robust when we consider alternative measures of ownership structure (OWNERSHIP_FAM, OWNERSHIP_INV and OWNERSHIP_COMP) and concentration (BLOCK_FAM, BLOCK_INV and BLOCK_COMP), as well as when we run panel data regressions. Table 3A (Panels A and B) in the Appendix report cross-section estimates with alternative measures of ownership structure (and their interactions with Big4), as well as panel estimates. As the structure of our dataset combines both cross-section and time dimensions, we also run the General Least Square (GLS) regressions. For panel estimates, the Hausman test recommends the use of random effects (Models 3 and 4, Panels A and B, Table 3A).

The decision of choosing a Big 4 auditor could be endogenous, given that agency conflicts and asymmetric information problems within the firms, as well as other firms' characteristics could condition this decision. In order to control for this possible endogeneity problem, we apply a two-stage least square (2SLS) estimation (Table 5).

$$\textit{First stage: BIG 4 choice}_{ij} = \alpha + \beta_1 \textit{Ownership}_{ij} + \beta_2 \textit{Controls}_{ij} + \phi \textit{IndustryDummy} + \varphi \textit{YearDummy} + \varepsilon_{ij}$$

$$\textit{Second stage: Debt Maturity}_{ij} = \alpha + \beta_1 \textit{Big N}_{ij} + \beta_2 \textit{Ownership}_{ij} + \beta_3 \textit{Controls}_{ij} + \phi \textit{IndustryDummy} + \varphi \textit{YearDummy} + \varepsilon_{ij}$$

The first step is a probit model that estimates the determinants of choosing a Big 4 auditor instead of a non-Big4. The second step analyzes the effect of the main variables of interest (the Big4 variable and the ownership variables) on debt maturity. In the first stage regression, we observe that firms having companies as the largest shareholder (MAIN_SH25_COMP) prefer to hire Big 4 auditors. Also, larger and older firms with higher growth opportunities prefer to choose a Big4 auditor instead of a non-Big 4. However, there

is a negative impact of profitability on the Big4 choice. The longer has the auditor provided its services to the firm (AUDIT_TENURE), the higher is the likelihood that a Big 4 auditor is selected. In the first stage regression, results show that the Big4 variable is positively and significantly related to debt maturity in most of the estimated models (Models 1 and 4). Firms with more than 25% of the ownership held by the three top shareholders (CONCENTRATION25) have more long-term debt. The fraction of long-term debt in a firm's capital structure is also higher for firms with a higher leverage (LEV), profitability (ROA) and size (SIZE), while it is lower for firms with a higher earnings' volatility (EARN_VOLATILITY) and financial strength (FINAC_STRENGTH). The lambda is significant at 10% level in Models 1 and 4.

[Insert Table 5 here]

In order to check the complementary effect of the Big 4 auditor and the ownership concentration variables, after controlling for the possible endogeneity problem of the Big 4 auditor choice, we apply the Heckman model as a robustness check (see Appendix, Table 3A). In Table 3A (panels A and B) we observe that firms with more than 25% of ownership hold by the three top shareholders (CONCENTRATION25) which are audited by a Big4 have more long-term debt and the effect of family ownership (MAIN_SH25_FAM, OWNERSHIP_FAM and BLOCK_FAM) on debt maturity (second stage) turns to be positive when the auditor is a Big4, supporting the previous complementary effect observed in Table 4. As expected, family ownership (BLOCK_FAM) has a negative and significant impact on the choice of a Big 4 auditor, consistent with previous studies (Niskanen et al., 2010). The rest of the results are in line with previous regressions. The lambda is significant for all models.

Taking into account the differences observed in relation to the size of the firm, in Table 6, we re-run the models presented in Table 4 for different sub-samples of firm size (expressed in terms of employees). We consider MICRO firms with less than 10 employees, SMALL firms those with more than 10 and less than 50 employees, MEDIUM firms with more than 50 and less than 25 employees, and LARGE firms with more than 250 employees. We observe that the BIG 4 variable loses significance for MICRO, SMALL and MEDIUM firms in all models, being positive and significant for the large sub-sample when the variable CONCENTRATION25 is included. The interaction term is significant for MEDIUM firms

if the variable of ownership is CONCENTRATION (BIG 4*CONCENTRATION). For the subsample of large firms, the negative effect of family firms (MAIN_SH25_FAM) on debt maturity and the positive effect of the interaction term (BIG 4*MAIN_SH25_FAM) is maintained as we observed in previous models. Therefore, the effect of Big 4 auditor and the ownership structure on debt maturity is conditioned by firm size.

[Insert Table 6 here]

5. Conclusion

The financial literature has focused on the equilibrium about the debt and equity choice, which is connected with the agency cost theory. The firms' financial decisions are related to the information available between firms and investors (shareholders and debtholders). This paper provides new evidences about the effect of two corporate governance mechanisms the auditor quality (Big 4 auditor) and ownership structure on the debt maturity structure of large and SMEs listed firms on the Alternative Investment Market (AIM). For these purposes, we investigate the impact of Big 4 auditors on debt maturity of 330 firms in the AIM during 1998-2016, as well as the complementary or substitute effect of ownership concentration. The AIM is characterized as strong legal and institutional quality, so in line with EL Ghoul et al. (2016), the effect of auditor quality on debt maturity could be higher in this country than others. Unlike previous studies, we compare the effect of Big 4 auditors on large firms, medium, small and microenterprises. As well as, the possible endogeneity problem of the auditor choice.

The main results show that there is a positive and significant relationship between Big 4 auditor and debt maturity, which is consistent with less agency conflicts in these firms. Family firms have a negative impact on debt maturity, which turns positive when they choose a Big 4 auditor. Therefore, the complement effect is shown in the results. These results are robust when we control for the possible endogeneity problem of Big 4 auditor choice. On the other hand, looking at auditor choice determinants, we find that family firms are reluctant to hire Big 4 auditor.

However, the positive effect of Big 4 auditor turns null or negative if the firm is micro, medium or small, showing the relevance of the size.

The main contribution of the paper is to analyze the effect of choose of the Big 4 firms and ownership structure as corporate governance mechanisms in large, medium, small and micro enterprises listed on the AIM.

The main implications of this paper are related to the less strict rules for listing on the alternative investment markets, the relevance of Big 4 auditor and ownership structure on debt maturity, and the importance of firm size.

Future research may build on our findings to increase the understanding of the role of auditors in SMEs and its effect on performance and the cost of financing comparing with large firms.

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7. Tables

Table 1-Description of the variables

Dependent Variable	*Source*

DEBT MATURITY	Long-term debt to total debt.		DataStream
Independent Variables		Notation	*Source*
Audit Quality	Dummy variable that is equal to one if the firm is client of one of the BIG 4 audit international firms (KPMG, Deloitte, PricewaterhouseCoopers and Ernst & Young) and 0 otherwise.	BIG4	Capital IQ
Ownership & Concentration	The percentage of ownership held by the major shareholder.	OWNERSHIP_MAIN_SH	Amadeus
	The sum of the ownership percentages of the largest three shareholders.	CONCENTRATION	Amadeus
	Dummy variable that is equal to 1 if the top three shareholders hold more than 25% of the ownership and 0 otherwise.	CONCENTRATION25	Amadeus
	Dummy variable that is equal to 1 if the largest shareholder is a family member and holds more than 25% of the ownership and 0 otherwise.	MAIN_SH25_FAM	Amadeus
	The percentage of family ownership in the firm by the largest shareholder (holding more than 25% of ownership).	OWNERSHIP_FAM	Amadeus
	Dummy variable that is equal to 1 if the top three shareholders are family members and hold (in sum) more than 25% percent of the firm ownership 0 otherwise.	BLOCK_FAM	Amadeus
Control Variables		Notation	***Source***
Leverage	Total debt divided by total assets	LEV	Datastream
Profitability	EBITDA divided by total assets	ROA	Datastream
Earning volatility	Standard deviation of ROA.	EARN_VOLATILITY	Datastream
Tangible assets	Tangible assets divided by total assets	TANG	Datastream
Firm Size	Logarithm of total assets.	SIZE	Datastream
Firm Age	Logarithm number of years since the firm's inception year.	AGE	Datastream
Growth Opportunities	Market value to book value ratio	MARKET_TO_ BOOK	Datastream
Financial Strength (Z-score_secure)	Dummy variable that takes the value of 1 if the Altman Z-Score is higher than 2.99 and 0 otherwise. Z-score is calculated as follows: Z=1.2*WCTA+1.4*RETA+3.3*EBITTA+0.6*BVRTD+1*STA (WCTA=working capital/total assets; RETA=retained earnings /total assets; EBITTA=ebit/total assets; BVRTD=market value of equity/total liabilities; STA=sales/total assets)	FINANC_STRENGTH	Datastream
Number of Board Directors	Number of board directors.	BOARD_SIZE	Capital IQ
Audit tenure	Number of years the auditor is providing the service to the firm.	AUDIT_TENURE	Capital IQ

Table 2. Descriptive Statistics.

The Table shows the mean and median value, the standard deviation, minimum and maximum values of the considered variables (PANEL A). The Table also reports the mean comparison t-test (pearson's χ^2 test) conducted to statistically compare the means of the considered variables between two groups of firms: firms audited by a Big 4 auditing firm and firms not audited by a Big 4 (PANEL B). Panel C provides the t-test of differences by disentangling among different size sub-samples. All variables are winsorized at 99% and 1% levels. For the sake of brevity, variable definitions are provided in Table 1.

Panel A.

Variable	Obs.	Mean	Median	Std. Dev	Min	Max
Firms' characteristics						
DEBT_MATURITY	2,609	0.52	0.58	0.36	0	1
BIG4	2,609	0.30	0	0.46	0	1
OWNERSHIP_MAIN_SH	1,794	0.20	0.36	0.15	0.0003	1
CONCENTRATION	1,634	0.40	0.36	0.20	0.01	1
CONCENTRATION25	1,634	0.77	1	0.42	0	1
MAIN_SH25_FAM	1,794	0.11	0	0.31	0	1
MAIN_SH25_INV	1,794	0.06	0	0.24	0	1
MAIN_SH25_COMP	1,794	0.06	0	0.24	0	1
BLOCK_FAM	1,634	0.20	0	0.40	0	1
BLOCK_INV	1,634	0.31	0	0.46	0	1
BLOCK_COMP	1,634	0.09	0	0.28	0	1
LEV	2,609	0.22	0.14	0.47	0.00008	10.86
ROA	2,603	-0.03	0.07	0.52	-12.75	0.95
EARN_VOLATILITY	2,602	0.47	0.13	2.77	0.009	65.88
TANG	2,600	0.72	0.79	0.26	0.050	1.16
SIZE	2,609	69381.1	27817	173448.7	107	3675136
AGE	2,154	26.66	14	31.21	1	126
MARKET_TO_BOOK	2,607	1.74	1.33	1.25	0.19	5.48
FINANC_STRENGTH	2,609	0.080	0	0.27	0	1
BOARD_SIZE	2,609	6.18	8	5.46	0	20
AUDIT_TENURE	2,609	8.12	8	3.73	1	15

Panel B.

	Big4=1	Big4=0	
Variable	**Mean**	**Mean**	**Diff (t-test)**
Firms' characteristics			
DEBT_MATURITY	0.58	0.48	(p=0.0000)***
OWNERSHIP_MAIN_SH	0.19	0.20	(p=0.3822)
CONCENTRATION	0.38	0.40	(p=0.075)*
CONCENTRATION25	0.75	0.77	(p=0.45)
MAIN_SH25_FAM	0.08	0.12	(p=0.0195)**
MAIN_SH25_INV	0.06	0.06	(p=0.9689)
MAIN_SH25_COMP	0.06	0.06	(p=0.7745)
BLOCK_FAM	0.13	0.23	(p=0.000)***
BLOCK_INV	0.38	0.27	(p=0.000)***
BLOCK_COMP	0.09	0.09	(p=0.78)
LEV	0.23	0.21	(p=0.2698)
ROA	0.013	-0.05	(p=0.0028)**
EARN_VOLATILITY	0.21	0.57	(p=0.0023)***
TANG	0.74	0.71	(p=0.0066)***
SIZE	134710.9	41825.08	(p=0.0000)***
AGE	34.44	23.34	(p=0.0000)***
MARKET_TO_BOOK	1.76	1.73	(p=0.5580)
FINANC_STRENGTH	0.07	0.08	(p=0.2690)
BOARD_SIZE	6.23	6.16	(p=0.7465)
AUDIT_TENURE	9.35	7.60	(p=0.0000)***

Panel C.

	All	Big4=1	Big4=0	
Variable	**Mean**	**Mean**	**Mean**	**Diff (t-test)**
DEBT_MATURITY (sub-sample firm size)				
ALL	0.52	0.58	0.48	(p=0.0000)***
MICRO (<10 employees)	0.39	-	0.39	-
SMALL (>10 and <50 employees)	0.44	0.42	0.44	(p=0.7977)
MEDIUM (>50 and <250 employees)	0.51	0.53	0.50	(p=0.2816)
LARGE (>250 employees)	0.58	0.63	0.54	(p=0.000)***

Table 3. Audit quality and debt maturity.

The Table shows the determinants of long-term debt using ordinary least squares (OLS). Dependent variable: DEBT_MATURITY defined as long-term debt over total debt. For the sake of brevity, variable definitions are provided in Table 1. All variables are winsorized at 99% and 1% levels.

Indep. Var.	(1) OLS Debt Maturity	(2) OLS Debt Maturity	(3) OLS Debt Maturity	(4) OLS Debt Maturity	(5) OLS Debt Maturity
BIG4	0.0560***	0.0497**	0.0603**	0.0616**	0.0481**
	(2.76)	(2.08)	(2.43)	(2.49)	(2.01)
OWNERSHIP_MAIN_SH		-0.2582			
		(-1.52)			
OWNERSHIP_MAIN_SH_SQ		0.4463**			
		(2.01)			
CONCENTRATION			0.0135		
			(0.27)		
CONCENTRATION25				0.0548**	
				(2.33)	
MAIN_SH25_FAM					-0.0622**
					(-2.04)
MAIN_SH25_INV					0.0107
					(0.26)
MAIN_SH25_COMP					0.0626*
					(1.66)
LEV	0.1008***	0.1176***	0.1454***	0.1477***	0.1278***
	(4.10)	(3.16)	(3.28)	(3.34)	(3.52)
ROA	0.0297	0.0257	0.0254	0.0244	0.0256
	(1.56)	(1.29)	(1.21)	(1.17)	(1.28)
EARN_VOLATILITY	-0.0068*	-0.0061	-0.0041	-0.0043	-0.0061
	(-1.83)	(-1.52)	(-0.86)	(-0.90)	(-1.50)
TANG	-0.0051	0.0153	-0.0091	-0.0124	0.0139
	(-0.13)	(0.34)	(-0.19)	(-0.25)	(0.30)
SIZE	0.0364***	0.0446***	0.0402***	0.0397***	0.0441***
	(4.75)	(4.94)	(4.16)	(4.11)	(4.90)
AGE	0.0010	0.0013	0.0004	-0.0007	0.0060
	(0.09)	(0.10)	(0.03)	(-0.06)	(0.48)
MARKET_TO_BOOK	0.0122	0.0094	0.0096	0.0099	0.0109
	(1.64)	(1.08)	(1.04)	(1.07)	(1.26)
FINANC_STRENGTH	-0.1198***	-0.1669***	-0.1586***	-0.1568***	-0.1607***
	(-3.68)	(-4.42)	(-3.98)	(-3.95)	(-4.26)
Constant	0.0707	0.0927	0.1475	0.1158	0.0528
	(0.64)	(0.70)	(1.01)	(0.80)	(0.41)
Observations	1,964	1,483	1,359	1,359	1,483
R-squared	0.13	0.16	0.17	0.17	0.17
Sector dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

T-statistics are in parentheses *** p<0.01, ** p<0.05, * p<0.10

Table 4. Audit quality and debt maturity (Interaction terms).

The Table shows the determinants of long-term debt using ordinary least squares (OLS). *Dependent variable: DEBT_MATURITY* defined as long-term debt over total debt. For the sake of brevity, variable definitions are provided in Table 1. All variables are winsorized at 99% and 1% levels.

Indep. Var.	(1) OLS Debt Maturity	(2) OLS Debt Maturity	(3) OLS Debt Maturity	(4) OLS Debt Maturity
BIG4*OWNERSHIP_MAIN_SH	0.0303			
	(0.08)			
BIG4*OWNERSHIP_MAIN_SH_SQ	0.2477			
	(0.51)			
BIG4*CONCENTRATION		0.2706**		
		(2.42)		
BIG4*CONCENTRATION25			0.0074	
			(0.15)	
BIG4*MAIN_SH25_FAM				0.2072***
				(2.81)
BIG4*MAIN_SH25_INV				0.2066**
				(2.30)
BIG4*MAIN_SH25_COMP				-0.0133
				(-0.17)
BIG4	0.0277	-0.0439	0.0560	0.0198
	(0.51)	(-0.88)	(1.23)	(0.76)
OWNERSHIP_MAIN_SH	-0.2394			
	(-1.21)			
OWNERSHIP_MAIN_SH_SQ	0.3359			
	(1.27)			
CONCENTRATION		-0.0541		
		(-0.95)		
CONCENTRATION25			0.0525*	
			(1.88)	
MAIN_SH25_FAM				-0.1077***
				(-3.15)
MAIN_SH25_INV				-0.0526
				(-1.05)
MAIN_SH25_COMP				0.0701
				(1.50)
LEV	0.1177***	0.1476***	0.1477***	0.1237***
	(3.17)	(3.33)	(3.34)	(3.41)
ROA	0.0259	0.0253	0.0244	0.0261
	(1.30)	(1.21)	(1.17)	(1.31)
EARN_VOLATILITY	-0.0061	-0.0040	-0.0043	-0.0061
	(-1.51)	(-0.86)	(-0.90)	(-1.50)
TANG	0.0215	-0.0050	-0.0122	0.0193
	(0.47)	(-0.10)	(-0.25)	(0.42)
SIZE	0.0447***	0.0394***	0.0396***	0.0425***
	(4.96)	(4.08)	(4.10)	(4.72)
AGE	0.0006	-0.0002	-0.0007	0.0087
	(0.05)	(-0.01)	(-0.05)	(0.71)
MARKET_TO_BOOK	0.0099	0.0098	0.0098	0.0108
	(1.13)	(1.06)	(1.06)	(1.24)
FINANC_STRENGTH	-0.1708***	-0.1625***	-0.1570***	-0.1599***
	(-4.51)	(-4.09)	(-3.95)	(-4.24)
Constant	0.0902	0.1893	0.1182	0.0698
	(0.67)	(1.29)	(0.81)	(0.54)
Observations	1,483	1,359	1,359	1,483
R-squared	0.17	0.17	0.17	0.17
Sector dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.10

Table 5. Audit quality choice and debt maturity (controlling endogeneity, 2SLS).

The Table shows the determinants of auditor's choice (1st stage) and the determinants of the debt maturity (2nd stage) following the two stage least squares (2SLS). Dependent variable: *DEBT_MATURITY* defined as long-term debt over total debt (2nd stage) and *BIG4* defined as a dummy variable that takes the value of 1 if the auditor is a Big 4 (1st stage). For the sake of brevity, variable definitions are provided in Table 1. All variables are winsorized at 99% and 1% levels.

Panel A

Indep. Var. (t-1 y t-2)	(1) 2º stage Debt Maturity	(1) 1º stage Big4t-1	(2) 2º stage Debt Maturity	(2) 1º stage Big4t-1	(3) 2º stage Debt Maturity	(3) 1º stage Big4t-1	(4) 2º stage Debt Maturity	(4) 1º stage Big4t-1
BIG4	0.1693**		0.1266		0.1292		0.1559*	
	(2.02)		(1.45)		(1.48)		(1.91)	
OWNERSHIP_MAIN_SH	-0.0244	-0.0320						
	(-0.13)	(-0.04)						
OWNERSHIP_MAIN_SH_SQ	0.1147	0.3016						
	(0.46)	(0.31)						
CONCENTRATION			0.0306	-0.0235				
			(0.56)	(-0.11)				
CONCENTRATION25					0.0587**	0.0396		
					(2.26)	(0.39)		
MAIN_SH25_FAM							-0.0294	-0.1128
							(-0.92)	(-0.78)
MAIN_SH25_INV							0.0309	0.1715
							(0.68)	(0.86)
MAIN_SH25_COMP							0.0038	0.3225**
							(0.09)	(1.97)
LEV	0.1453***	0.0461	0.1721***	-0.2269	0.1748***	-0.2253	0.1547***	0.0226
	(3.45)	(0.23)	(3.52)	(-0.94)	(3.59)	(-0.94)	(3.75)	(0.12)
ROA	0.0455**	-0.2331**	0.0447**	-0.1649	0.0438**	-0.1675	0.0466**	-0.2415**
	(2.12)	(-2.22)	(2.02)	(-1.19)	(1.98)	(-1.22)	(2.17)	(-2.29)
EARN_VOLATILITY	-0.0086*	-0.1706	-0.0073	-0.1799	-0.0075	-0.1778	-0.0087*	-0.1942
	(-1.75)	(-1.25)	(-1.34)	(-1.28)	(-1.38)	(-1.27)	(-1.78)	(-1.40)
TANG	0.0506	-0.1933	0.0564	-0.1893	0.0584	-0.1904	0.0533	-0.2115
	(1.15)	(-1.06)	(1.21)	(-1.00)	(1.25)	(-1.01)	(1.21)	(-1.16)
SIZE	0.0333***	0.3949***	0.0404***	0.3591***	0.0400***	0.3597***	0.0348***	0.3892***
	(2.66)	(11.19)	(3.11)	(9.53)	(3.10)	(9.54)	(2.85)	(10.95)
AGE	-0.0067	0.1077**	-0.0161	0.1436***	-0.0168	0.1431***	-0.0048	0.1132**
	(-0.55)	(2.36)	(-1.20)	(2.98)	(-1.25)	(2.97)	(-0.39)	(2.49)
MARKET_TO_BOOK	0.0073	0.0920**	0.0143	0.1046***	0.0139	0.1054***	0.0090	0.0941**
	(0.76)	(2.47)	(1.37)	(2.68)	(1.34)	(2.69)	(0.94)	(2.55)
FINANC_STRENGTH	-0.1857***	-0.4407***	-0.1719***	-0.5279***	-0.1670***	-0.5239***	-0.1847***	-0.4599***
	(-4.90)	(-2.68)	(-4.20)	(-3.06)	(-4.08)	(-3.03)	(-4.87)	(-2.76)
BOARD_SIZE		-0.0021		-0.0084		-0.0084		-0.0012
		(-0.27)		(-1.03)		(-1.03)		(-0.15)
AUDIT_TENURE		0.0886***		0.0905***		0.0907***		0.0902***
		(7.30)		(7.06)		(7.08)		(7.41)
Constant	0.1903	-5.1941***	0.1446	-4.7749***	0.1125	-4.8139***	0.1704	-5.1894***
	(1.31)	(-9.91)	(0.89)	(-8.16)	(0.69)	(-8.23)	(1.21)	(-10.13)
Lambda	-0.0976*		-0.0713		-0.0734		-0.0915*	
	(-1.92)		(-1.33)		(-1.38)		(-1.85)	
Observations	1,222	1,222	1,078	1,078	1,078	1,078	1,222	1,222
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi2	129.73	129.73	108.17	108.17	113.71	113.71	130.27	130.27

z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.10

Table 6. Audit quality and debt maturity (Interaction terms). Subsamples Size.

The Table shows the determinants of long-term debt using ordinary least squares (OLS). We distinguish between MICRO firms with less than 10 employees, SMALL firms those with more than 10 and less than 50 employees, MEDIUM firms with more than 50 and less than 25 employees, and LARGE firms with more than 250 employees. *Dependent variable: DEBT_MATURITY* defined as long-term debt over total debt. For the sake of brevity, variable definitions are provided in Table 1. All variables are winsorized at 99% and 1% levels.

Panel A

Indep. Var.	(1) OLS Debt Maturity (Micro)	(2) OLS Debt Maturity (Small)	(3) OLS Debt Maturity (Medium)	(4) OLS Debt Maturity (Large)
BIG4*OWNERSHIP_MAIN_SH		2.0585	0.3235	0.0115
		(0.96)	(0.46)	(0.02)
BIG4*OWNERSHIP_MAIN_SH_SQ		-3.7313	-0.2145	-0.0143
		(-1.02)	(-0.23)	(-0.02)
BIG4		-0.2620	-0.0305	0.0482
		(-1.01)	(-0.29)	(0.69)
OWNERSHIP_MAIN_SH	1.3119	-0.8622	0.3956	-0.4326
	(1.13)	(-1.16)	(1.20)	(-1.38)
OWNERSHIP_MAIN_SH_SQ	-0.9815	1.1248	-0.6756	0.5701
	(-0.98)	(0.93)	(-1.42)	(1.41)
LEV	0.0546	0.0019	0.1567**	0.1636
	(0.41)	(0.02)	(2.45)	(1.62)
ROA	0.0035	-0.0378	-0.0004	0.0157
	(0.10)	(-0.51)	(-0.01)	(0.38)
EARN_VOLATILITY	0.1804**	-0.0082	-0.0002	-0.1640**
	(2.61)	(-0.87)	(-0.02)	(-2.37)
TANG	-0.6520*	0.2221	-0.0480	-0.1646**
	(-1.98)	(1.47)	(-0.67)	(-2.02)
SIZE	-0.0721	0.0151	-0.0310	0.0546***
	(-0.66)	(0.37)	(-1.38)	(3.11)
AGE	-1.4304*	-0.0219	-0.0636**	0.0213
	(-2.16)	(-0.49)	(-2.48)	(1.18)
MARKET_TO_BOOK	-0.0731	0.0016	0.0007	-0.0013
	(-0.88)	(0.06)	(0.05)	(-0.09)
FINANC_STRENGTH		-0.3747**	-0.1636**	-0.0997**
		(-2.04)	(-2.42)	(-2.02)
Constant	2.2285	0.6900	0.6362**	0.1050
	(1.72)	(1.30)	(2.15)	(0.47)
Observations	35	222	567	602
R-squared	0.96	0.35	0.24	0.36
Sector dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.10

Panel B

Indep. Var.	(1) OLS Debt Maturity (Micro)	(2) OLS Debt Maturity (Small)	(3) OLS Debt Maturity (Medium)	(4) OLS Debt Maturity (Large)
BIG4*CONCENTRATION		-0.1526	0.4282**	-0.0119
		(-0.37)	(2.04)	(-0.08)
BIG4		0.0400	-0.1378	0.0690
		(0.21)	(-1.48)	(1.02)

CONCENTRATION	0.0888	-0.3062*	-0.0044	-0.0261
	(0.28)	(-1.80)	(-0.05)	(-0.26)
LEV	0.9778	0.0401	0.4615***	0.1623
	(1.35)	(0.43)	(4.58)	(1.57)
ROA	0.1658	-0.0320	-0.0965	0.0093
	(1.39)	(-0.40)	(-1.27)	(0.22)
EARN_VOLATILITY	0.8609	-0.0069	0.0006	-0.1627**
	(1.52)	(-0.72)	(0.07)	(-2.15)
TANG	-1.4144	0.2256	-0.0663	-0.1444*
	(-2.02)	(1.42)	(-0.88)	(-1.73)
SIZE	-0.1125	0.0062	-0.0299	0.0472**
	(-1.32)	(0.14)	(-1.26)	(2.48)
AGE	-2.1895	-0.0123	-0.0761***	0.0131
	(-1.57)	(-0.25)	(-2.80)	(0.70)
MARKET_TO_BOOK	-0.0115	0.0111	-0.0006	-0.0141
	(-0.12)	(0.42)	(-0.04)	(-0.89)
FINANC_STRENGTH		-0.4243**	-0.1057	-0.0916*
		(-2.26)	(-1.49)	(-1.78)
Constant	3.0947	0.8258	0.6695**	0.1546
	(1.75)	(1.49)	(2.03)	(0.65)
Observations	27	199	516	568
R-squared	0.98	0.36	0.27	0.35
Sector FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.10

Panel C

Indep. Var.	(1) OLS Debt Maturity (Micro)	(2) OLS Debt Maturity (Small)	(3) OLS Debt Maturity (Medium)	(4) OLS Debt Maturity (Large)
BIG4*CONCENTRATION25		-0.0121	0.0118	-0.0708
		(-0.06)	(0.13)	(-1.08)
BIG4		0.0029	0.0190	0.1215*
		(0.02)	(0.22)	(1.95)
CONCENTRATION25	-0.2503	0.0524	0.0975**	0.0384
	(-0.84)	(0.60)	(2.29)	(0.85)
LEV	0.4571	0.0087	0.4609***	0.1566
	(0.52)	(0.09)	(4.59)	(1.52)
ROA	0.1064	-0.0246	-0.0907	0.0147
	(0.83)	(-0.30)	(-1.19)	(0.35)
EARN_VOLATILITY	0.4287	-0.0130	0.0025	-0.1539**
	(0.62)	(-1.29)	(0.28)	(-2.04)
TANG	-0.7141	0.1227	-0.0810	-0.1452*
	(-0.73)	(0.74)	(-1.08)	(-1.75)
SIZE	-0.1113	0.0023	-0.0323	0.0450**
	(-1.45)	(0.05)	(-1.36)	(2.35)
AGE	-2.3350	-0.0176	-0.0804***	0.0101
	(-1.93)	(-0.35)	(-2.98)	(0.54)
MARKET_TO_BOOK	-0.0667	0.0036	-0.0008	-0.0135
	(-0.61)	(0.13)	(-0.05)	(-0.85)
FINANC_STRENGTH		-0.4254**	-0.0988	-0.0972*
		(-2.24)	(-1.39)	(-1.90)
Constant	3.5042	0.8599	0.6388*	0.1372
	(2.19)	(1.54)	(1.95)	(0.59)
Observations	27	199	516	568
R-squared	0.98	0.34	0.27	0.35
Sector FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.10

Table 7. Audit quality and debt maturity (Interaction terms). Subsample Size

Dependent variable: DEBT_MATURITY (long-term debt) defined as long-term debt over total debt. *Explanatory variables*: Interaction terms *Big4*main_sh25_fam, big4*main_sh25_inv, Big4*main_sh25_comp*; *BIG4* is a dummy variable that takes the value of 1 of the auditor is a Big 4; *MAIN_SH25_FAM, MAIN_SH25_INV, MAIN_SH25_COMP* defined as a dummy variable that is equal to 1 if the largest shareholder is a family member (institutional investors or company) and holds more than 25% of the ownership; FINANC_STRENGTH is a dummy variable that is equal to 1 if Z-score is higher than 2.99, which is calculated as Z=1.2*wcta+1.4*reta+3.3*ebitta+0.6*bvrtd+1*sta (wcta=working capital/total assets; rate=retained earnings /total assets; ebitta=ebit/total assets; bvrtd=market value of equity/total liabilities; sta=sales/total assets). Data source: Datastream and Capital IQ. All variables are winsorized at level 99% and 1%.

Panel D

Indep. Var.	(1) OLS Debt Maturity	(2) OLS Debt Maturity	(3) OLS Debt Maturity	(4) OLS Debt Maturity
BIG4*MAIN_SH25_FAM		0.0114	0.1644	0.2392**
		(0.05)	(1.41)	(2.44)
BIG4*MAIN_SH25_INV		-0.1922	0.3004**	0.0079
		(-0.47)	(2.14)	(0.06)
BIG4*MAIN_SH25_COMP		0.4486*	-0.1118	-0.1367
		(1.67)	(-0.75)	(-1.42)
BIG4		-0.1177	-0.0055	0.0433
		(-1.03)	(-0.12)	(1.21)
MAIN_SH25_FAM	0.4483*	-0.1278	-0.0680	-0.1666***
	(2.03)	(-1.37)	(-1.45)	(-2.82)
MAIN_SH25_INV	-0.0038	-0.3890***	-0.0394	0.0286
	(-0.03)	(-2.69)	(-0.47)	(0.35)
MAIN_SH25_COMP	0.2159	0.0476	0.0875	0.0434
	(0.78)	(0.34)	(1.09)	(0.59)
LEV	-0.0059	0.0614	0.1232**	0.1833*
	(-0.05)	(0.72)	(2.06)	(1.83)
ROA	0.0142	-0.0591	0.0246	0.0265
	(0.47)	(-0.82)	(0.40)	(0.64)
EARN_VOLATILITY	0.1627**	-0.0092	-0.0004	-0.1515**
	(2.63)	(-1.02)	(-0.05)	(-2.20)
TANG	-0.6359*	0.2013	-0.0351	-0.1481*
	(-1.96)	(1.39)	(-0.49)	(-1.83)
SIZE	-0.0726	0.0148	-0.0337	0.0520***
	(-0.93)	(0.37)	(-1.49)	(2.97)
AGE	-1.2279*	-0.0122	-0.0550**	0.0258
	(-2.07)	(-0.28)	(-2.15)	(1.44)
MARKET_TO_BOOK	-0.0922	0.0161	0.0034	-0.0024
	(-1.58)	(0.68)	(0.24)	(-0.16)
FINANC_STRENGTH		-0.3992**	-0.1647**	-0.0794
		(-2.25)	(-2.44)	(-1.64)
Constant	2.1797*	0.4353	0.6662**	0.0815
	(2.13)	(0.88)	(2.26)	(0.38)
Observations	35	222	567	602
R-squared	0.98	0.40	0.25	0.37
Sector FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.10

Appendix

Table 1A (PANEL A). Industry distribution of sample firms.

SIC code 2 digit	Industry Name	All		Big4		Non-Big4	
		#firms	%	#firms	%	#firms	%
1	Agricultural Production – Crops	1	0.30			1	0.37
2	Agricultural Production - Livestock and Animal Specialties	1	0.30	1	0.78	1	0.37
7	Agricultural Services	1	0.30	1	0.78	1	0.37
10	Metal Mining	23	6.97	4	3.13	19	7.01
12	Coal Mining	1	0.30	1	0.78		
13	Oil and Gas Extraction	23	6.97	8	6.25	17	6.27
14	Mining and Quarrying of Nonmetallic Minerals, Except Fuels	5	1.52	2	1.56	3	1.11
15	Construction - General Contractors & Operative Builders	1	0.30			1	0.37
17	Construction - Special Trade Contractors	3	0.91	3	2.34	3	1.11
20	Food and Kindred Products	9	2.73	3	2.34	8	2.95
22	Textile Mill Products	1	0.30	1	0.78	1	0.37
23	Apparel, Finished Products from Fabrics & Similar Materials	3	0.91	1	0.78	2	0.74
25	Furniture and Fixtures	3	0.91			3	1.11
26	Paper and Allied Products	5	1.52	4	3.13	3	1.11
27	Printing, Publishing and Allied Industries	4	1.21	2	1.56	4	1.48
28	Chemicals and Allied Products	18	5.45	5	3.91	16	5.90
29	Petroleum Refining and Related Industries	3	0.91	3	2.34	1	0.37
30	Rubber and Miscellaneous Plastic Products	2	0.61			2	0.74
32	Stone, Clay, Glass, and Concrete Products	5	1.52	2	1.56	4	1.48
33	Primary Metal Industries	1	0.30	1	0.78	1	0.37
34	Fabricated Metal Products	5	1.52			5	1.85
35	Industrial and Commercial Machinery and Computer Equipment	9	2.73	2	1.56	8	2.95
36	Electronic & Other Electrical Equipment & Components	23	6.97	10	7.81	21	7.75
37	Transportation Equipment	2	0.61	1	0.78	2	0.74
38	Measuring, Photographic, Medical, & Optical Goods, & Clocks	17	5.15	7	5.47	14	5.17
39	Miscellaneous Manufacturing Industries	2	0.61	1	0.78	1	0.37
41	Local & Suburban Transit & Interurban Highway Transportation	1	0.30			1	0.37
42	Motor Freight Transportation	1	0.30			1	0.37
44	Water Transportation	1	0.30	1	0.78	1	0.37
45	Transportation by Air	2	0.61	1	0.78	1	0.37
48	Communications	5	1.52	1	0.78	4	1.48
49	Electric, Gas and Sanitary Services	6	1.82	2	1.56	5	1.85
50	Wholesale Trade - Durable Goods	2	0.61	1	0.78	1	0.37
51	Wholesale Trade - Nondurable Goods	3	0.91	2	1.56	2	0.74

54	Food Stores	1	0.30	1	0.78		
55	Automotive Dealers and Gasoline Service Stations	2	0.61	2	1.56		
57	Home Furniture, Furnishings and Equipment Stores	1	0.30			1	0.37
58	Eating and Drinking Places	5	1.52	2	1.56	4	1.48
59	Miscellaneous Retail	4	1.21	1	0.78	4	1.48
70	Hotels, Rooming Houses, Camps, and Other Lodging Places	3	0.91			3	1.11
72	Personal Services	1	0.30	1	0.78		
73	Business Services	80	24.24	34	26.56	66	24.35
78	Motion Pictures	1	0.30	1	0.78	1	0.37
79	Amusement and Recreation Services	5	1.52	1	0.78	4	1.48
80	Health Services	2	0.61	1	0.78	1	0.37
82	Educational Services	1	0.30			1	0.37
83	Social Services	2	0.61	2	1.56	2	0.74
87	Engineering, Accounting, Research, and Management Services	26	7.88	10	7.81	22	8.12
89	Services, Not Elsewhere Classified	4	1.21	1	0.78	4	1.48
	Total	330	100	128	100	271	100

Note: Given that some firms could be audited one year for a Big4 and other not the sum of column “Big4” and “Non-Big4” is not equal to column “All”.

Table 1A (Panel B). Industry distribution of sample firms (mean of debt maturity).

SIC code 2 digit	Industry Name	All
		Mean
1	Agricultural Production – Crops	0.59
2	Agricultural Production - Livestock and Animal Specialties	0.30
7	Agricultural Services	0.88
10	Metal Mining	0.46
12	Coal Mining	0.63
13	Oil and Gas Extraction	0.53
14	Mining and Quarrying of Nonmetallic Minerals, Except Fuels	0.57
15	Construction - General Contractors & Operative Builders	0.73
17	Construction - Special Trade Contractors	0.70
20	Food and Kindred Products	0.39
22	Textile Mill Products	0.25
23	Apparel, Finished Products from Fabrics & Similar Materials	0.59
25	Furniture and Fixtures	0.44
26	Paper and Allied Products	0.45
27	Printing, Publishing and Allied Industries	0.56
28	Chemicals and Allied Products	0.57
29	Petroleum Refining and Related Industries	0.82
30	Rubber and Miscellaneous Plastic Products	0.53
32	Stone, Clay, Glass, and Concrete Products	0.56

33	Primary Metal Industries	0.14
34	Fabricated Metal Products	0.43
35	Industrial and Commercial Machinery and Computer Equipment	0.43
36	Electronic & Other Electrical Equipment & Components	0.47
37	Transportation Equipment	0.40
38	Measuring, Photographic, Medical, & Optical Goods, & Clocks	0.44
39	Miscellaneous Manufacturing Industries	0.44
41	Local & Suburban Transit & Interurban Highway Transportation	0.66
42	Motor Freight Transportation	0.87
44	Water Transportation	0.45
45	Transportation by Air	0.78
48	Communications	0.68
49	Electric, Gas and Sanitary Services	0.65
50	Wholesale Trade - Durable Goods	0.55
51	Wholesale Trade - Nondurable Goods	0.53
54	Food Stores	0.68
55	Automotive Dealers and Gasoline Service Stations	0.78
57	Home Furniture, Furnishings and Equipment Stores	0.49
58	Eating and Drinking Places	0.64
59	Miscellaneous Retail	0.51
70	Hotels, Rooming Houses, Camps, and Other Lodging Places	0.64
72	Personal Services	0.84
73	Business Services	0.48
78	Motion Pictures	0.26
79	Amusement and Recreation Services	0.74
80	Health Services	0.78
82	Educational Services	0.35
83	Social Services	0.86
87	Engineering, Accounting, Research, and Management Services	0.54
89	Services, Not Elsewhere Classified	0.69

Table 2A. Audit quality and debt maturity (ownership variables).

The Table shows the determinants of long-term debt using both ordinary least squares (OLS) in Models 1 and 2 and panel data random effects (GLS) in Models 3 and 4. Panel A illustrates the effect on debt maturity of alternative variables of ownership structure and Panel B the interaction effect of such variables with Big4. *Dependent variable: DEBT_MATURITY*

defined as long-term debt over total debt. For the sake of brevity, variable definitions are provided in Table 1. All variables are winsorized at 99% and 1% levels.

Panel A

Indep. Var.	(1) OLS Debt Maturity	(2) OLS Debt Maturity	(3) GLS (random effects) Debt Maturity	(4) GLS (random effects) Debt Maturity
BIG4	0.0858***	0.0864***	0.0380	0.0573**
	(4.29)	(4.21)	(1.45)	(2.06)
OWNERSHIP_FAM	-0.0197		-0.0450	
	(-0.28)		(-0.70)	
OWNERSHIP_INV	0.2551***		0.0848	
	(2.75)		(1.02)	
OWNERSHIP_COMP	0.2289***		0.1574**	
	(3.10)		(2.13)	
BLOCK_FAM		-0.0251		-0.0049
		(-1.08)		(-0.23)
BLOCK_INV		0.0271		-0.0028
		(1.34)		(-0.15)
BLOCK_COMP		0.0333		0.0128
		(1.04)		(0.41)
FINANC_STRENGTH	-0.1561***	-0.1559***	-0.0637*	-0.0658*
	(-4.79)	(-4.61)	(-1.90)	(-1.89)
Constant	0.4505***	0.4860***	0.4337***	0.4672***
	(5.98)	(5.70)	(3.22)	(3.38)
Observations	1,778	1,624	1,778	1,624
# firms			306	299
R-squared	0.14	0.15		
Wald Chi2			76.82	66.45
Sector dummies	Yes	Yes		
Sector FE			Yes	Yes
Year dumies	Yes	Yes		
Year FE			Yes	Yes

Panel B

Indep. Var.	(1) OLS Debt Maturity	(2) OLS Debt Maturity	(3) GLS (random effects) Debt Maturity	(4) GLS (random effects) Debt Maturity
BIG4*OWNERSHIP_FAM	0.2393		0.1164	
	(1.43)		(0.78)	
BIG4*OWNERSHIP_INV	0.1152		0.0772	
	(0.53)		(0.41)	
BIG4*OWNERSHIP_COMP	0.0351		-0.0806	
	(0.23)		(-0.57)	
BIG4*BLOCK_FAM		0.1024*		0.0108
		(1.81)		(0.21)
BIG4*BLOCK_INV		-0.0098		-0.0337
		(-0.23)		(-0.86)
BIG4*BLOCK_COMP		0.0225		-0.0346
		(0.33)		(-0.54)
BIG4	0.0605*	0.0728**	0.0301	0.0699**
	(1.76)	(2.58)	(0.84)	(2.16)
OWNERSHIP_FAM	-0.0727		-0.0721	
	(-0.91)		(-1.00)	
OWNERSHIP_INV	0.2304**		0.0676	
	(2.18)		(0.72)	
OWNERSHIP_COMP	0.2237**		0.1909**	
	(2.42)		(2.20)	
BLOCK_FAM		-0.0465*		-0.0069
		(-1.76)		(-0.29)
BLOCK_INV		0.0296		0.0081
		(1.21)		(0.36)
BLOCK_COMP		0.0275		0.0250
		(0.71)		(0.67)
FINANC_STRENGTH	-0.1546***	-0.1524***	-0.0620*	-0.0644*
	(-4.73)	(-4.49)	(-1.84)	(-1.85)
Constant	0.4559***	0.4902***	0.4327***	0.4617***
	(6.00)	(5.73)	(3.20)	(3.33)
Observations	1,778	1,624	1,778	1,624
# firms	306	299		
R-squared	0.14	0.15		
Wald Chi2			78.17	67.21
Sector dummies	Yes	Yes		
Sector FE			Yes	Yes
Year dumies	Yes	Yes		
Year FE			Yes	Yes

t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.10

Table 3A. Audit quality choice and debt maturity (controlling endogeneity, Heckman Model 2 Stage.

The table shows the determinants of auditor's choice (1st stage) and the determinants of the debt maturity when the firm is audited by a Big4 (2nd stage) following the Heckman (1979) model in two steps. Dependent variable: *DEBT_MATURITY* defined as long-term debt over total debt (2nd stage) and *BIG4* is a dummy variable that takes the value of 1 if the auditor is a Big 4 (1st stage). For the sake of brevity, variable definitions are provided in Table 1. All variables are winsorized at 99% and 1% levels.

Panel A

Indep.Var.	(1) 2º stage Debt Maturity	(1) 1º stage Big4t-1	(2) 2º stage Debt Maturity	(2) 1º stage Big4t-1	(3) 2º stage Debt Maturity	(3) 1º stage Big4t-1	(4) 2º stage Debt Maturity	(4) 1º stage Big4t-1
OWNERSHIP_MAIN_SH	0.3830	-0.2010						
	(1.12)	(-0.29)						
OWNERSHIP_MAIN_SH_SQ	-0.3821	0.4709						
	(-0.90)	(0.51)						
CONCENTRATION			0.2142**	-0.0592				
			(2.18)	(-0.30)				
CONCENTRATION25					0.0467	0.0785		
					(1.07)	(0.85)		
MAIN_SH25_FAM							0.1090*	-0.0935
							(1.69)	(-0.69)
MAIN_SH25_INV							0.2051***	-0.0242
							(2.82)	(-0.14)
MAIN_SH25_COMP							-0.0728	0.2153
							(-1.18)	(1.46)
LEV	0.3091***	0.4980***	0.4058***	0.4309**	0.4159***	0.4306**	0.3211***	0.5006***
	(3.42)	(2.95)	(3.95)	(2.11)	(4.01)	(2.11)	(3.77)	(3.02)
ROA	0.1293	-0.1587*	0.0554	-0.0978	0.0595	-0.0997	0.1519*	-0.1559
	(1.41)	(-1.66)	(0.55)	(-0.84)	(0.58)	(-0.86)	(1.68)	(-1.62)
EARN_VOLATILITY	0.0401	-0.2589**	0.0528	-0.2656**	0.0493	-0.2615**	0.0553	-0.2720**
	(0.55)	(-2.14)	(0.71)	(-2.17)	(0.66)	(-2.13)	(0.76)	(-2.20)
TANG	-0.0548	-0.3085*	-0.0458	-0.2969*	-0.0437	-0.3003*	-0.0413	-0.3151*
	(-0.65)	(-1.82)	(-0.54)	(-1.70)	(-0.51)	(-1.72)	(-0.50)	(-1.86)
SIZE	-0.0249	0.4141***	-0.0167	0.3910***	-0.0164	0.3915***	-0.0264	0.4086***
	(-0.98)	(12.87)	(-0.67)	(11.67)	(-0.66)	(11.69)	(-1.08)	(12.59)
AGE	0.0085	0.0861**	-0.0005	0.1033**	0.0022	0.1034**	0.0130	0.0898**
	(0.42)	(2.01)	(-0.02)	(2.32)	(0.11)	(2.32)	(0.66)	(2.11)
MARKET_TO_BOOK	-0.0049	0.0674**	-0.0097	0.0719**	-0.0083	0.0733**	-0.0001	0.0678**
	(-0.27)	(1.96)	(-0.52)	(2.03)	(-0.45)	(2.07)	(-0.00)	(1.99)
FINANC_STRENGTH	-0.1107	-0.4957***	-0.1221*	-0.5138***	-0.1177*	-0.5062***	-0.1409**	-0.4924***
	(-1.63)	(-3.34)	(-1.74)	(-3.33)	(-1.67)	(-3.28)	(-2.09)	(-3.29)
BOARD_SIZE		0.0040		0.0005		0.0005		0.0041
		(0.56)		(0.07)		(0.07)		(0.57)
AUDIT_TENURE		0.0884***		0.0897***		0.0902***		0.0885***
		(7.71)		(7.47)		(7.51)		(7.70)
Constant	1.0103***	-5.4625***	0.9519**	-5.3627***	0.9715**	-5.4420***	1.0362***	-5.4501***
	(2.68)	(-11.46)	(2.54)	(-10.60)	(2.55)	(-10.77)	(2.91)	(-11.66)
Lambda	-0.1924***		-0.1785**		-0.1812**		-0.1959***	
	(-2.63)		(-2.40)		(-2.44)		(-2.78)	
Observations	1,821	1,821	1,664	1,664	1,664	1,664	1,821	1,821
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi2	43.65	43.65	46.48	46.48	42.75	42.75	55.92	55.92

z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.10

Panel B

	(1)	(1)	(2)	(2)

Indep.Var.	2º stage Debt Maturity	1º stage Big4t-1	2º stage Debt Maturity	1º stage Big4t-1
OWNERSHIP_FAM	0.4622**	-0.2063		
	(2.42)	(-0.62)		
OWNERSHIP_INV	0.3408	0.8438**		
	(1.48)	(2.02)		
OWNERSHIP_COMP	0.0154	0.7043**		
	(0.12)	(2.22)		
BLOCK_FAM			0.1507***	-0.2327**
			(2.77)	(-2.09)
BLOCK_INV			0.0054	0.0836
			(0.14)	(0.94)
BLOCK_COMP			-0.0187	0.0914
			(-0.32)	(0.68)
LEV	0.3045***	0.5003***	0.4239***	0.4533**
	(3.50)	(2.97)	(4.08)	(2.22)
ROA	0.1380	-0.1447	0.0818	-0.0790
	(1.51)	(-1.46)	(0.82)	(-0.65)
EARN_VOLATILITY	0.0520	-0.2884**	0.0551	-0.2870**
	(0.71)	(-2.29)	(0.75)	(-2.29)
TANG	-0.0438	-0.3148*	-0.0464	-0.3032*
	(-0.53)	(-1.85)	(-0.55)	(-1.73)
SIZE	-0.0205	0.4006***	-0.0092	0.3743***
	(-0.85)	(12.26)	(-0.39)	(10.94)
AGE	0.0056	0.0911**	0.0022	0.1057**
	(0.28)	(2.13)	(0.11)	(2.36)
MARKET_TO_BOOK	-0.0032	0.0640*	-0.0049	0.0680*
	(-0.18)	(1.88)	(-0.27)	(1.91)
FINANC_STRENGTH	-0.1222*	-0.5127***	-0.1126	-0.5155***
	(-1.80)	(-3.40)	(-1.61)	(-3.31)
BOARD_SIZE		0.0049		-0.0002
		(0.68)		(-0.02)
AUDIT_TENURE		0.0905***		0.0915***
		(7.87)		(7.59)
Constant	0.9631***	-5.4429***	0.8918**	-5.1811***
	(2.76)	(-11.58)	(2.50)	(-10.18)
Lambda	-0.1867***		-0.1596**	
	(-2.75)		(-2.27)	
Observations	1,821	1,821	1,664	1,664
Sector FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Wald Chi2	49.82	49.82	50.66	50.66

z-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.10

Table A4. Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. DEBT_MATURITY	1.00																
2. BIG4	0.11**	1.00															
	(0.00)																
3 . OWNERSHIP_MAIN_SH	0.02	0.04**	1.00														
	(0.32)	(0.03)															
4. CONCENTRATION	-0.003	0.004	0.89***	1.00													
	(0.85)	(0.81)	(0.00)														
5. CONCENTRATION25	0.03	0.02	0.50***	0.63***	1.00												
	(0.23)	(0.29)	(0.00)	(0.00)													
6. MAIN_SH25_FAM	-0.02	-0.03*	0.45***	0.43***	0.20***	1.00											
	(0.25)	(0.07)	(0.00)	(0.00)	(0.00)												
7. MAIN_SH25_INV	0.01	0.03	0.31***	0.35***	0.17***	-0.09***	1.00										
	(0.61)	(0.15)	(0.00)	(0.00)	(0.00)	(0.00)											
8. MAIN_SH25_COMP	0.007	0.04**	0.44***	0.37***	0.17***	-0.10***	-0.08***	1.00									
	(0.73)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)										
9. LEV	0.04***	0.009	0.06***	0.03	0.03	0.008	0.00	0.03*	1.00								
	(0.008)	(0.54)	(0.00)	(0.11)	(0.13)	(0.60)	(0.95)	(0.06)									
10. ROA	0.04***	0.05***	0.01	0.02	0.04	0.03*	0.002	-0.003	-0.33***	1.00							
	(0.007)	(0.00)	(0.41)	(0.19)	(0.01)	(0.05)	(0.91)	(0.87)	(0.00)								
11. EARN_VOLATILITY	-0.04***	-0.07***	-0.04***	-0.02	-0.03	-0.03*	-0.02	-0.005	0.11	-0.27***	1.00						
	(0.007)	(0.00)	(0.00)	(0.17)	(0.11)	(0.06)	(0.28)	(0.75)	(0.00)	(0.00)							
12. TANG	-0.03**	0.05***	0.07***	0.05***	0.01	0.03**	0.03*	0.038**	0.01	-0.018	-0.01	1.00					
	(0.04)	(0.00)	(0.00)	(0.00)	(040)	(0.04)	(0.05)	(0.02)	(0.37)	(0.10)	(0.29)						
13. SIZE	0.11***	0.13***	-0.006	-0.006	-0.01	-0.02	0.006	0.01	-0.02	0.04***	-0.03**	0.05***	1.00				
	(0.00)	(0.00)	(0.72)	(0.75)	(0.54)	(0.18)	(0.72)	(0.38)	(0.19)	(0.00)	(0.01)	(0.00)					

14. AGE	0.03**	0.11***	0.04*	-0.01	-0.02	0.03	0.01	-0.02	-0.002	0.09***	-0.08***	0.22***	0.003	1.00			
	(0.04)	(0.00)	(0.02)	(0.58)	(0.22)	(0.11)	(0.57)	(0.27)	(0.87)	(0.00)	(0.00)	(0.00)	(0.80)				
15. MARKET_TO_BOOK	-0.005	-0.02	-0.03*	-0.06***	-0.04	-0.03*	-0.03*	-0.02	-0.08***	-0.04***	0.02	0.09***	-0.07***	-0.11***	1.00		
	(0.71)	(0.16)	(0.06)	(0.00)	(0.03)	(0.05)	(0.05)	(0.34)	(0.00)	(0.00)	(0.16)	(0.00)	(0.00)	(0.00)			
16. FINANC_STRENGTH	-0.11***	-0.02	0.03	0.001	0.002	0.07***	0.03	-0.02	-0.07***	0.13***	-0.04***	0.19***	-0.3**	0.21***	0.04***	1.00	
	(0.00)	(0.18)	(0.1)	(0.93)	(0.93)	(0.00)	(0.07)	(0.43)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)		
17. BOARD_SIZE	-0.03**	0.032**	-0.08***	-0.05***	-0.05***	-0.004	-0.02	-0.05***	-0.03*	-0.009	0.07***	0.08***	-0.01	0.11***	-0.02	0.02	1.00
	(0.04)	(0.02)	(0.00)	(0.00)	(0.00)	(0.81)	(0.15)	(0.00)	(0.09)	(0.52)	(0.00)	(0.00)	(0.37)	(0.00)	(0.15)	(0.29)	
18. AUDIT_TENURE	0.08***	0.18***	-0.02	-0.05***	-0.006	0.04**	-0.05***	-0.05***	-0.03*	0.06***	-0.05***	0.10***	-0.01	0.10***	0.03**	0.08***	-0.03*
	(0.00)	(0.00)	(0.33)	(0.00)	(0.72)	(0.01)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.39)	(0.00)	(0.02)	(0.00)	(0.06)