

Marchica, Maria

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## On the relevance of ownership structure in determining the maturity of debt

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# Working Paper Series

## ON THE RELEVANCE OF OWNERSHIP STRUCTURE IN DETERMINING THE MATURITY OF DEBT

Maria-Teresa Marchica

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The University of Manchester  
Booth Street West  
Manchester M15 6PB

+44(0)161 306 1320  
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## Author(s) and affiliation

Dr. Maria-Teresa Marchica  
Manchester Business School and  
Accounting and Finance Group  
Manchester, M15 6PB  
Tel +44(0) 161 275 0121  
Email: [maria.marchica@mbs.ac.uk](mailto:maria.marchica@mbs.ac.uk)  
<http://www.personal.mbs.ac.uk/mmarchica/>

## Keywords

debt maturity; ownership structure; corporate governance; endogeneity; GMM

## JEL Classification

G32, G34

## Abstract

I show that ownership by blockholding and board composition is an important determinant of corporate debt maturity structure. Using GMM methodology to control for the potential endogeneity of all regressors, I find a statistically and economically significant negative relation between short-term debt and both blockholding and board structure, irrespective of the identity of shareholders. Robustness tests provide support for the hypothesis that less diversified shareholders tend to trade off underinvestment against the liquidity risk entailed in shorter maturities. Finally, I report strong evidence that the link with insider ownership is non-linear.

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# ON THE RELEVANCE OF OWNERSHIP STRUCTURE IN DETERMINING THE MATURITY OF DEBT

**Maria-Teresa Marchica\***  
*Manchester Business School (UK)*

## ABSTRACT

I investigate whether ownership by blockholders is an important determinant of corporate debt maturity. Using GMM methodology to control for the endogeneity of all regressors, I document an economically significant negative link between short term debt and ownership by blockholders. This suggests that, in trading off costs and benefits of short term debt, less diversified shareholders are more concerned about liquidity risk than underinvestment costs. Additionally, I report strong evidence that the link with insider ownership is non-linear. Finally, I find a negative relation between short term debt and board structure which indicates that these are alternative agency control mechanisms.

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JEL Classification: G32, G34

*Key words:* debt maturity; ownership structure; corporate governance; endogeneity; GMM

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\* Address for correspondence: Maria-Teresa Marchica, Manchester Accounting and Finance Group, Manchester Business School, Crawford House, Oxford Road, Manchester, M13 9PL, UK; phone: +44 (0) 161 2750121; fax: +44 (0) 161 2754023; e-mail: maria.marchica@mbs.ac.uk

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Since Myers (1977), capital structure studies have documented the importance of short-term debt in mitigating the underinvestment problem. However, debt maturing within a shorter horizon increases the risk of suboptimal liquidation and, thus, increases the expected bankruptcy costs (Diamond (1991); Johnson (2003)). Therefore, in choosing their optimal debt maturity structure, firms trade off the benefits of lower underinvestment entailed by shorter maturities against the cost of increasing liquidation risk.

Datta et al. (2005) recently introduced a new layer to this debate by relaxing the assumption of perfectly aligned managers.<sup>1</sup> They argue that short-term debt can be very costly for managers: first, because they are highly risk averse (Denis (2001)), and second, because it entails tighter monitoring (Hart and Moore (1995)). Consequently, if insiders are not aligned to shareholders' interests, they have a strong preference for long- over short-term debt. Increasing insider ownership would then moderate manager shareholder conflicts and, thus, reduce the likelihood that firms will choose suboptimal longer maturity structures.

This paper addresses several important, previously unaddressed issues. First, I show that it is crucial to control for the equity positions of outside investors, besides those of insiders, in order to have a more complete understanding of firms' debt maturity choices. As ownership concentration increases, large investors stand to lose more in case of underinvestment. However, larger blockholders have greater incentives to monitor managers. This, in turn, can reduce equity agency conflicts and limit managers' preferences for longer maturities. Consequently, a positive link between ownership concentration and the proportion of short-term debt in the capital structure may result, reflecting the reduced exposure to underinvestment.

Nevertheless, there is a trade-off between a high degree of monitoring, which is promoted by concentrated ownership, and risk-sharing gains, which require more diffuse ownership (Admati et al. (1994)). Ownership concentration can be very costly for holders of large block positions, as the reduced portfolio diversification exposes them more to the liquidity risk. Therefore, they may be expected to prefer longer maturities. Overall, blockholders will push for a certain maturity structure of debt on the basis of this trade-off between the benefits of reduced underinvestment costs and the increased costs associated with liquidity risk. Based on theoretical arguments alone, it is difficult to predict which of these aspects will dominate, and it becomes an empirical issue that I explicitly test in this work.

A second important aspect I examine is how different shareholders influence the corporate debt maturity structure. The literature on shareholder activism has focused on the role played by institutional investors given the rising size of their equity positions around the

world.<sup>2</sup> Institutional investors typically own more diversified portfolios than non-financial investors (Denis (2001)) and may have a different propensity to get involved in the decision making than non-financial ones (i.e., Gorton and Kahl (1999); Hartzell and Starks (2003)). In particular, the potential liquidity risk entailed in shorter maturities may have a relatively small effect on the total wealth of very well diversified shareholders, possibly leading to a positive (or at most insignificant) relation between short-term debt and institutional ownership.

As opposed to previous studies, I also evaluate the possibility that the link between insider ownership and debt maturity is non-linear. According to Jensen and Meckling (1976), managers are not fully aligned with shareholders' interests unless they own 100% of the shares; however, as managers' shareholding increases, their discretion over the firm's resources increases as well (entrenchment effect). It is therefore important to explore whether there is a non-linear relation between managerial ownership and maturity decisions. Consequently, I include a quadratic term for managerial ownership in my models.

A further original aspect of my study is that I analyze the role of board composition. Corporate governance practices have evolved considerably over the last fifteen years, focusing much of the attention on the composition of board of directors. As Dahya and McConnell (2005) report, at least 18 countries have published codes of best corporate governance practice along the lines of the initial Cadbury code published in 1992. Following the UK example, these codes have strongly emphasized the importance of board composition. This has a direct bearing on the topic under analysis here as, through their monitoring of managers' actions, "better" boards of directors could steer capital structure decisions away from suboptimal levels. As this is the first test on this matter, I explore whether both the CEO/Chairman split and the proportion of non-executives on the board are negatively related to short-term debt, to the extent that different control mechanisms substitute for each other to reduce the equity agency conflicts.

A great complication in this field arises from the fact that not only can the ownership structure affect the choice of a specific maturity of debt, but the structure can also *be affected* by debt. For instance, debt maturity is, in itself, a tool that can reduce agency conflicts (Stulz (2000)) and it can potentially act as a substitute for ownership concentration, insider ownership, and board composition. I adopt the Generalized Method of Moments technique to clearly identify the direction of causality between maturity and ownership and corporate governance characteristics, besides controlling for the endogeneity of all regressors (i.e., leverage) and the presence of unobservable fixed effects.

To investigate my hypotheses, I use an original, hand-collected database of a large sample of UK non-financial listed firms between 1991 and 2001. Analysis of the UK system is important for a number of reasons. First, as I document here, UK companies rely on debt due within one year significantly more than their US counterparts, regardless their size.<sup>3</sup> This is critical in this context, as debt maturing within one year has stronger implications for liquidity risk than longer maturities. As Table I shows, for instance, the median total debt due within one year for small UK firms is 72%; the corresponding figure for the US is only about 3%. In addition, my calculations reveal that a staggering 30% of US listed firms do not have any debt maturing within one year. Conversely, only 1% of the entire UK sample does not have debt maturing in this time frame.<sup>4 5</sup> Thus, the UK provides an ideal testing ground for the Diamond (1991) theory on the relevance of the liquidity risk embedded in short maturities. This paper on the UK market, then, can add to existing US studies that usually investigate longer maturities.

[INSERT TABLE I HERE]

Second, UK firms are subject to agency conflicts similar to those of their US counterparts, but, as underlined by Dahya and McConnell (2005), the UK was a “first mover” in this quest for better corporate governance and for this reason provides a sort of natural experiment to test my hypotheses. Finally, as the LSE is becoming the largest stock market in the world (*New York Times* (2006)), study of UK firms is of growing importance.

I find strong evidence that the relation between short-term debt and blockholding is both statistically and economically significant. An increase of one standard deviation in blockholding reduces short-term debt by 6.5% of its mean. Turning to shareholders’ identity, institutional and non-institutional owners have both a significant and negative impact on short-term debt, corroborating the view that less diversified shareholders prefer longer maturities, regardless of their categorization. These results suggest that the liquidity risk issue dominates the underinvestment one. Robustness tests performed on sub-samples of very high/low liquidity risk firms corroborate these findings. When expected liquidity risk costs are very high, then shareholders opt for lengthening the maturity of debt. Vice versa, when I isolate low liquidity risk companies, I find that not only do large shareholders have a much lower economic impact in the low volatility and small companies sub-samples than the impact estimated for the entire sample, but also the impact of large shareholders becomes positive for companies with low growth opportunities.

I find strong evidence of a U-shaped relation between short-term debt and managerial ownership in line with the alignment/entrenchment incentives associated with insider shareholding. Moreover, my tests indicate that the link between insider ownership and maturity

of debt is endogenous. This is a focal outcome, given that my results indicate a change in the sign of the estimated coefficients once endogeneity is kept into account. In addition, my tests lend support to the hypothesis that the division of responsibilities at the head of the company is not only statistically significant but economically sizeable. On average, companies that separate the CEO from the Chairman have lower short-term debt by around 16.5% of its mean.

This paper adds to the important evidence provided by Datta et al. (2005) by including ownership by blockholders and board composition in the maturity models. The sizeable economic impact I document for these variables reveals that they are important determinants of corporate debt maturity, and neglecting them may lead to severely biased and inconsistent evidence. Further, my analysis of maturity due within one year highlights how the incentives of blockholders and managers can be different due to increased liquidity risk issues.

In addition, building on the Johnson (2003) study, this paper provides additional evidence of the trade-off between (lower) underinvestment and liquidity risk, showing how the latter is crucial when we analyze the link between maturity choices and ownership structure. The robustness checks on a sub-sample of firms extend Diamond's (1991) argument and Datta et al.' (2005) results as well by documenting that the incentives for blockholders are likely to affect the relation between debt maturity and liquidity risk.

Finally, the findings in this paper extend our knowledge on the interrelation between different control mechanisms (e.g., Aggarwal and Knoeber (1996)), by showing a substitution effect between short-term debt, on one hand, and ownership and governance characteristics, on the other.

In the following section I describe data and methodology. Section II contains the results, while Section III reports the robustness checks. Section IV concludes.

## **I. Data and Methodology**

### *A. Data*

In the initial stage, I randomly selected a sample of approximately 1,000 UK listed non-financial firms from *Datastream* constituent lists. As ownership and corporate governance information were not available in machine-readable form, I hand-collected this data from the *PriceWaterhouse Corporate Register* (December issue) for the period 1991-2001 (Marchica and Mura (2005); Mura (2007)). Economic and market data were downloaded from *Datastream*. Data on credit rating were kindly provided by *Reuters*.

To be able to follow companies over time from two different datasets, I devoted a huge effort toward tracking all the name changes (and defunct companies) in the sample period. I



retrieved this information from the *Stock Exchange Official Yearbook*, which reports systematic information on name changes, entries removed from the companies section, companies in liquidation, and companies in receivership and in administration. Moreover, as a further check, I consulted the Companies House website, which is the official UK government register of UK companies.

To run the empirical analysis, I undertook a number of steps. First, I cleaned the dataset of outliers. I thoroughly inspected the ownership part of the dataset in several directions. For example, the total shares collected for each company should not sum to more than 100%. In cases where it did, I performed cross-checks with other issues of the Hemscott volumes (using either the September edition of the same year or the March edition of the following year) and/or with the *Stock Exchange Official Yearbook*, which also contains some ownership information. In cases where it proved impossible to find coherent information from the different sources of data, I dropped the observation from the sample.

I then checked for outliers in the economic variables. There is no fixed rule for dealing with this issue, so, as a general rule of thumb, I trimmed data to the 99% percentile. I then benchmarked the trimmed data with descriptive statistics reported in other papers to ensure that the sample was representative of the population of non-financial firms in the market. After the issue of outliers had been addressed, I excluded firms in the public utilities because of the peculiarities in their operational and regulatory conditions. I also excluded all firm-years missing observations for any variable.

Finally, I retained all firms with at least five consecutive years of observations, in order to compute asymptotically efficient second order serial correlation tests for GMM estimations (Arellano and Bond (1991)). After this screening, there remained an unbalanced panel of 656 firms with 5,983 observations.

I went to considerable lengths to check for consistency in the data and, in particular, for attrition bias. Analysis of comparative descriptive statistics shows that the firms used in the empirical analysis are not systematically different from those excluded.

To test my hypotheses, I adopt three alternative measures of blockholding: the proportion of shares held by all non-managerial shareholders with more than 5% of shares (*Blockholding*); the Herfindahl Index for all non-managerial owners (*Herfindahl Index*); and the proportion of shares held by the largest non-managerial shareholder with more than 5% of shares (*Largest Non-Managerial Ownership*). Unlike the US system, in the UK the disclosure threshold was lowered to 3% in 1990 (Companies Act 1985). The decision to define *Blockholding* and *Largest Non-Managerial Ownership* at 5% instead of 3% is based on the fact

that the Companies Act 1985 empowers shareholders with at least 5% of shares to add any resolution to the AGM agenda. For robustness purposes, I replicate all models with ownership variables at 3% cut-off. Results are qualitatively very similar to those reported here.

Furthermore, I distinguish blockholders by their identity. I discriminate between direct ownership by all institutional investors (*Institutional Ownership*), including banks, insurance companies, pension funds, and fund managers and similar and direct ownership by non-financial institutions (*Non-Institutional Ownership*), comprising private individuals and non-financial companies.<sup>6</sup> I also divide the ownership of the largest blockholder (*Largest Non-Manerial Ownership*) into institutional (*Largest Institutional Ownership*) and non-institutional ownership (*Largest Non-Institutional Ownership*).

I measure managerial ownership as the proportion of shares held by the executive directors to the total shares outstanding at the end of the fiscal year (*Executive Ownership*) in line with Datta et al. (2005). Executives are those who are directly involved in the daily business of the firm and, thus, make the financial decisions. To consider non-executive shareholding as part of managerial ownership (as in Guney and Ozkan (2005)) can be misleading, as non-executives have a specific role as monitors of executive decisions, although they are equally responsible for the company's business strategy.<sup>7</sup> Therefore, it is important to distinguish between the two groups of directors and explore how their different roles and incentives influence the debt maturity structure of firms. This leads to a separate analysis of the impact of board composition on the debt maturity choice. I include in my analysis two variables representing board composition: a dummy equal to one if the company has two distinct officers for the CEO and Chairman (*Split*); and the proportion of non-executives to the total number of directors (*Ratio*).

## *B. Methodology*

To test my hypotheses, I specify a partial adjustment model for debt maturity decisions. Under imperfect capital markets, the influence of financing decisions on firm value may imply that firms have a long-run target financial structure that is determined by corporate and personal taxes, liquidity and bankruptcy costs, and agency-related costs. Taking this argument as a starting point, Jalilvand and Harris (1984) examine the issuance of short-term and long-term debt by assuming the existence of a target debt maturity. In addition, Brick and Ravid (1991) demonstrate theoretically the existence of an optimal debt maturity structure in the presence of interest rate uncertainty. However, market imperfections, such as transaction costs (e.g., a delay in the (re)negotiation process with external lenders), will lead firms not to

conform completely to their target, but instead to follow a pattern of partial adjustment.<sup>8</sup> Therefore, I estimate the following dynamic model:

$$MAT_{it} = \alpha MAT_{it-1} + \sum_{k=1}^k \beta_k X_{it} + \eta_i + \eta_t + v_{it} \quad i = 1, 2, \dots, N; t = 1, 2, \dots, T \quad (1)$$

Firm-specific effects,  $\eta_i$ , allow for heterogeneity in the means of dependent variables across individuals and reflect qualitative characteristics that make each firm different, such as market reputation, quality of management, and the features of the industry in which the firm operates. Time-specific effects,  $\eta_t$ , on the other hand, reflect macroeconomic events that may influence all firms.

Arellano and Bond (1991) demonstrate that, in estimating a partial adjustment model such as equation (1), both OLS and Within Group (WG) methodologies produce biased and inconsistent results, because of the presence of individual heterogeneity and endogeneity of the lagged dependent variable. The bias can be even stronger if, besides the lagged dependent variable, other regressors are potentially endogenous. Endogeneity arises because shocks that affect debt maturity decisions are also likely to affect regressors such as leverage, growth opportunities, and asset maturity. In addition, this problem may derive from cross-causality. It could be argued that, for instance, both outsiders and insiders may decide to keep their shares in a certain company on the basis of the liquidity risk of its capital structure, or on the level of agency conflicts. A further source of endogeneity arises if there are unobservable firm-specific characteristics that are correlated with the regressors.

The use of a simultaneous equations model (SEM) is efficient in dealing with the contemporaneous correlation between some variables in the model and the presence of firm-specific effects, but it ignores partial adjustment behavior and tends to treat the majority of regressors in the model as exogenously determined. For instance, Datta et al. (2005), Johnson (2003), and Barclay et al. (2003) have specified systems of equations for maturity and leverage to control for their simultaneous determination. However, they treat all the other regressors as exogenous.

Endogeneity of both the lagged dependent variable and the other regressors requires the use of an Instrumental Variables estimation method that also makes it possible to control for fixed effects. Arellano and Bond (1991) derived a Generalized Method of Moments (GMM-DIFF) estimator that has been shown to be more efficient than other procedures in dealing with these issues, by taking the first difference of the model and using lagged levels of endogenous variables as instruments.

In this type of analysis, the choice of an appropriate set of instruments is crucial. The validity of the instruments can be tested by the Sargan test of overidentifying restrictions. This is asymptotically distributed as  $\chi^2$  under the null hypothesis of zero correlation between the instruments and the error term. Rejection by the Sargan test casts doubt on the validity of the instruments. By adopting the Difference Sargan test, as suggested by Arellano and Bond (1991) and Bond (2002), I can discriminate the strongly endogenous from the weakly endogenous and exogenous regressors to choose the appropriate set of instruments.<sup>9</sup> The results of these diagnostic checks suggest that leverage and size are to be treated as strongly endogenous, while all the remaining regressors are to be considered weakly endogenous. No test supports the hypothesis of exogeneity of any of the regressors.

Using too many moment conditions dramatically reduces the power of the Sargan statistic to detect invalid instruments (Bowsher (2002)). As a consequence, I use only one lagged level (t-2) for strongly endogenous variables and only two lagged levels (t-1 and t-2) for weakly endogenous ones.

The dependent variable (*MAT*) is defined as the proportion of debt due within one year. Besides the ownership variables discussed in the previous section, equation (1) also incorporates a set of control variables derived from the maturity literature.

Following the contracting-cost theory (Myers (1977); Barnea et al. (1980)), I include a proxy for growth opportunities, expecting a positive relation with short-term debt due to underinvestment problems. However, firms with high growth opportunities are also expected to suffer more from liquidity risk problems, and this may give them an incentive to borrow long term (Guedes and Opler (1996); Johnson (2003)). I define growth opportunities (*Market-to-Book*) as the ratio of market value of total assets (book value of total assets minus book value of total equity plus market value of total equity) to book value of total assets. Another implication of contracting-cost theory relates to firm size. Larger firms are less exposed to the agency costs of debt. Moreover, they have easier access to capital markets than smaller firms (Titman and Wessel (1988); Barclay and Smith (1995)), and can guarantee long-term debt with substantial collateral. As a result, the relation between short-term debt and firm size is expected to be negative. Size (*Size*) is defined as the natural logarithm of total assets in 1991 prices. Myers (1977) also argues that debt repayments should be scheduled to match the decline in value of assets in place. Consequently, I expect a negative relation between short-term debt and asset maturity (*Asset Maturity*), defined as the ratio of total fixed assets (net total of land and buildings, plant and machinery, construction in progress, and other fixed assets) to annual depreciation expense, in line with Guedes and Opler (1996).

I also include leverage (*Leverage*), defined as the total amount of debt to total assets. Following the liquidity risk theory (Diamond (1991)), highly-levered firms may lengthen debt maturity to reduce the liquidity risk embedded in short-term debt (Johnson (2003)). Further, Diamond (1991) demonstrates that high credit quality firms are more able to borrow in the long-term capital markets. On average, firms with a credit rating are more likely to be of high credit quality than unrated ones and thus more able to lengthen their debt maturity. I incorporate a proxy for credit rating (*Rating*), defined as a dummy equal to one if a company is rated and zero otherwise. I also include a measure of volatility as an additional proxy for credit risk in line with previous work (Johnson (2003); Datta et al. (2005)). I expect firms with more volatile cash flow to be negatively related with short-term debt. I define volatility (*Volatility*) as the standard deviation of the first differences of earnings before taxes and depreciation over the four years preceding the sample year, divided by average total assets for that period.

Based on the signaling theory proposed by Flannery (1986), I expect that high-quality firms will issue debt with shorter maturities to signal their quality to the market. In line with Barclay and Smith (1995), I include a proxy for quality (*Quality*), which is defined as the difference between the pre-tax profits in  $t+1$  and the pre-tax profits in  $t$  divided by the pre-tax profits in  $t$ .

Finally, according to the conclusions of tax-based studies, I predict a positive relation between short-term debt and the effective tax rate (Kane et al. (1985)) and a negative relation between short-term debt and the term structure (Brick and Ravid (1985)). Tax rate (*Tax*) is defined as total tax charge divided by pre-tax profits; while the term structure measure (*Term Structure*) is approximated by the difference between the yields on 10-year government bonds and three-month Treasury bills.

## II. Results

### A. Summary Statistics

Table II reports information on the ownership characteristics of my sample across the entire estimation period. Figures in Panel A suggest that non-managerial shareholding shows some volatility but no clear trend. Average blockholding with more than 5% shares (*Blockholding*) remains around 24%, while all financial (*Institutional Ownership*) and non-financial shareholders (*Non-Institutional Ownership*) hold about 16% and 7%, respectively, of total outstanding shares.

Similar results are obtained when I calculate the average holding by each financial and non-financial owner. However, average shareholding by the largest non-managerial owner

appears to be increasing over time. On the other hand, the distribution of ownership by executive directors clearly decreases by approximately 6% in ten years, with almost half of this reduction taking place between 1991 and 1993, immediately after the Cadbury Report was issued (1992).

Further, Panel B shows that, while average board size is relatively stable over time (*Executive Directors* plus *Non-Executive Directors*), the composition of the board changes significantly. In 1991, there was an average of 4.71 executives and 2.33 non-executives, but by 2001, non-executives constituted almost half of the average board. These figures corroborate the findings of Faccio and Lasfer (2000) and Peasnell et al. (2003). Results on *Split*, on the other hand, show that most of the UK companies have separated the roles of CEO and Chairman during the 90s, in line with the evidence by Peasnell et al. (2003) and Lasfer (2004).

Moreover, figures in Table II provide some interesting insight about the monitoring incentives of different categories of shareholders. Although the average shareholding of institutional investors as a group (*Institutional Ownership*) is around 16% in all years, this stake is held by an average of fewer than two institutions (*Institutional Investors*). On the other hand, non-financial corporations and individuals (*Non-Institutional Ownership*) hold fewer shares in the UK market than institutional investors, on average 7% across years. However, in the average firm, a non-institutional investor owns a greater stake than a financial shareholder, because there are .8 non-financial owners for every 1.7 institutional investors (see Table II Panel B). This may reduce the coordination problems for non-institutional shareholders and increase the incentives to monitor managerial behavior more actively. Further, a single individual (or a non-financial company) is more likely to have a less diversified investment portfolio than an investment company. This may support the hypothesis that non-financial shareholders may prefer to lengthen the maturity of debt more than institutional investors.

[INSERT TABLE II HERE]

Table III provides descriptive statistics for all variables over the entire sample period. For the average firm, 54% of total debt is due within one year (*MAT*). This figure is in line with Antoniou et al. (2006) for the UK.

I also report an average market-to-book ratio of 1.57, in line with US evidence as well (Johnson (2003); Datta et al. (2005)). The average asset maturity of 9.94 years is 30% lower than that reported by Antoniou et al. (2006). This result may suggest that firms shortened their debt maturities in the last decade of the century to match the decrease in asset maturity during the same period. Datta et al. (2005) document the opposite trend in the US system during the

1990s. The other economic variables are consistent with other UK-based studies (Ozkan (2000); Antoniou et al. (2006)).

[INSERT TABLE III HERE]

Table IV reports the Pearson correlations matrix among short-term debt and ownership and corporate governance variables (Panel A) and short-term debt and some of the key economic variables-- growth opportunities, leverage, and rating (Panel B). The simple relation between debt maturity and different proxies for blockholding shows that non-managerial shareholders seem to be positively related to short-term debt when considered as a group (*Blockholding* and *Herfindhal Index*), while the relation becomes negative when I isolate the most undiversified non-managerial owner (*Largest Non-Managerial Ownership*), consistent with the hypothesis that less diversified shareholders tend to trade off the benefits of reduced underinvestment and the increased liquidity problems. Further, the correlation with debt maturity appears different depending on the type of shareholder, although the signs are not in line with my prediction. Undiversified shareholders (*Non-Institutional Ownership* and *Largest Non-Institutional Ownership*) seem to be positively related to short maturity, while the opposite appears to hold for well diversified owners (*Institutional Ownership* and *Largest Institutional Ownership*). Ownership by executive directors is positively related to the maturity variable. Further, there is no indication of a non-linear relation when I consider the quadratic form of *Executive Ownership*. This seems to be in line with the evidence provided by previous studies. Finally, in support of my hypothesis of a substitution relation among alternative control mechanisms, both proxies for board composition (*Split* and *Ratio*) are negatively correlated to short-term debt.

In Panel B I document a positive relation with growth opportunities (*Market-to-Book*), which supports the Myers's (1977) prediction related to the underinvestment problem. On the other hand, the negative relation with *Leverage* is more consistent with the hypothesis of liquidity risk and is in line with previous work (Barclay et al. (2003); Johnson (2003); and Datta et al. (2005)).

However, a *caveat* is necessary here, as a simple correlation neglects the possibility that all these variables may be endogenously determined. This calls for a more accurate and detailed analysis that takes into account the endogeneity issue among all regressors, besides the influence of both firm- and time-specific effects.

[INSERT TABLE IV HERE]

## B. Regression Results

Table V presents results for equation (1) estimated with alternative methods. Models 1 and 2 show estimations in OLS and WG, respectively. In Model 3 results are obtained using the GMM method that controls for the endogeneity issue. The Sargan statistic and tests for the first and second order serial correlation are reported. The insignificant Sargan tests across all specifications confirm the validity of the instrument set, while the m1 and m2 statistics consistently indicate serial correlation of order one (as expected) but not of order two.<sup>10</sup>

Anderson and Hsiao (1982) argue that OLS and WG estimates of the lagged dependent variable  $\alpha$  are biased in opposite directions: upward for the OLS, due to the presence of firm-specific effects, and downward for the WG regression, due to the correlation between the transformed lagged dependent variable and the transformed error term. As Bond (2002) maintains, a candidate consistent estimator is expected to lie between the OLS and WG estimates, or at least not to be significantly higher than the former, or significantly lower than the latter. Figures in Table V show that the coefficient for the lagged dependent variable estimated in GMM (0.482) is indeed between the OLS and WG ones (0.695 and 0.330, respectively), in line with the econometrics theory.

In addition, not controlling for endogeneity may also influence the sign of the estimated coefficients, leading to misinterpretation of the results. *Executive Ownership*, for instance, has a positive and significant impact on short-term debt in Models 1 and 2, in line with the results in Datta et al. (2005) and Guney and Ozkan (2005); in Model 3, when endogeneity is controlled for, its estimated impact becomes negative.

Estimating the same models above in a static framework leaves the results unchanged. However, findings in Table V show that the coefficient of the lagged maturity is positive and significantly different from zero. Therefore, the adjustment factor  $\lambda$ , given by  $1 - \alpha$ , which represents the ability of firms to adjust to their target maturity levels, is greater than 0.5, possibly providing evidence that the dynamic nature of equation (1) is not rejected. This is consistent with Ozkan (2000) and Antoniou et al. (2006). Firms seem to adjust their short-term debt relatively quickly, in an attempt to reach their target debt maturity.

[INSERT TABLE V HERE]

### B.1. Blockholders and Their Identity

In Tables V and VI the estimates of all proxies for blockholding, *Blockholding*, *Herfindahl Index*, and *Largest Non-Managerial Ownership*, are negative and significant (Models 3 through 6). Further, calculating the economic significance from Model 4 (6), I find



that incrementing *Blockholding (Largest Non-Managerial Ownership)* of one standard deviation reduces short-term debt by 6.5 (6.4)% of its mean. In other words, an increase in the equity position of *Blockholding (Largest Non-Managerial Ownership)* from the median 21.09 (9.11) to the 95<sup>th</sup> percentile 55.36 (29.9) is predicted to decrease the proportion of short-term debt by 12.7% (11.5%). Similarly, an increase of one standard deviation of the *Herfindahl Index*, generates a reduction of short-term debt by around 7.2% (Model 5).

This strongly corroborates the hypothesis that blockholding plays a significant role in determining the maturity structure of debt, and omitting it may cause severe bias in the estimations. The negative estimated coefficient suggests that the liquidity risk effect tends to dominate the underinvestment effect. To have more short term debt in the firm capital structure can be very costly for blockholding. Large shareholders with less diversified portfolios are more exposed to higher suboptimal liquidation costs. They would, thus, impose longer maturities, although this implies an increased underinvestment problem.

I perform some robustness checks using an alternative definition of debt maturity, that is, debt due within five years, as longer maturities imply lower liquidity risk. To the extent that the liquidity risk effect dominates the underinvestment effect, I expect a weaker (or even insignificant) impact of blockholding on the maturity choice. Indeed, unreported tests lend support to this argument since, although still negative and significant, the economic impact of blockholding on the alternative debt maturity results more than halved.

Findings in Models 3 through 6 may also have some implications in terms of manager-shareholder conflicts and monitoring instruments. Indeed, the negative sign is consistent with the idea that the disciplinary pressure imposed on managers by outside owners acts as a substitute for the disciplinary role of short debt maturity (Hart and Moore (1995)). This may also suggest that increased monitoring may reduce the efficacy of debt as a market-signaling device (Zechahauser and Pound (1990)). In this respect, this evidence extends the findings provided by the literature on the interdependence between different control mechanisms from an agency perspective. Previous studies, in fact, have analyzed the interrelations between leverage, on one hand, and a number of ownership and directors characteristics, on the other, overlooking the monitoring role of debt maturity and its potential association with other controlling devices (Jensen et al. (1992); Bathala et al. (1994); Agrawal and Knoeber (1996); Crutchley et al. (1999)).

Models 7 and 8 in Table VI provide further insight into the relation between debt maturity decisions and non-managerial shareholders. I do not find support for the hypothesis that different shareholders have different incentives to monitor and, therefore, different impacts

on maturity decisions. Instead, the presence of individuals and/or non-financial corporations, both as a group (*Non-Institutional Ownership*) and as the largest non-managerial owners (*Largest Non-Institutional Ownership*), is inversely related to short-term debt. Non-financial shareholders are less diversified and, thus, more exposed to liquidity risk. They have a clear incentive to lengthen the maturity of debt. Nonetheless, the evidence I report also suggests that debt maturity and non-institutional shareholders are substitute monitoring instruments. Non-financial shareholders may benefit from monitoring managerial behavior in line with the argument by Admati et al. (1994), and this may be a signal to the market of mitigated agency conflicts within the firm.

On the other hand, I do not detect a significant relation between institutional investors and debt maturity decisions when I consider institutional investors as a group (*Institutional Ownership*, Model 7). This may be interpreted as evidence of free-riding problems among multiple investors. However, when I single out the investor with the largest stake among institutional shareholders (*Largest Institutional Ownership*, Model 8), the results show that its impact on maturity decisions is negative and significant. Looking at the descriptive analysis of ownership data in Panel A Table II, one possible justification for this result is that the largest institutional owner holds a significant stake in the company. Although larger investors have the option of simply selling their holdings, the extent of the average holding is so large that the shares cannot be sold without negatively affecting the stock price. Therefore, the argument that concentrated owners face a trade-off between underinvestment and liquidity risk may apply to financial investors as well.

Moreover, this result could also suggest that by virtue of its substantial stake in the company, even a large financial institution may provide lenders with a positive signal of some monitoring actions and intervention in the firm business activity. Consistent with this evidence, Gillan and Starks (2000) argue that in the US system the low annual turnover of shares of the CalPERS (California Public Employee Retirement System) and the New York Retirement funds implies that larger investors may have incentives to hold shares and actively encourage managers to improve performance and increase shareholder value. Furthermore, Bhojraj and Sengupta (2003) document a negative (positive) relation between institutional investors' ownership and bond yields (bond ratings) supporting the idea that rating agencies and bondholders perceive institutional investors as active players in reducing management opportunism and promoting firm value. Similarly UK-based studies have underlined the role played by the network of informal communication and coalitions between institutional investors within the "London Square Mile" in increasing the involvement of the institutions in

company life in terms of voting (Mallin (2001)) and more efficient investments (Goergen and Renneboog (2001)) and in improving the return on shareholders' equity (Short and Keasey (1999)). Alternatively, the evidence I report may support the efficient monitoring hypothesis of Pound (1988), who maintains that institutional investors can be more efficient monitors than other shareholders because of their greater expertise, especially in financial matters. Therefore, the negative impact on short-term debt may represent a substitution among control mechanisms. In line with this idea, Bathala et al. (1994) and Crutchley et al. (1999) document that the monitoring role of institutional ownership is an alternative device to the disciplinary role of debt.

[INSERT TABLE VI HERE]

### *B.2. Managerial Ownership*

Model 3 in Table V shows that managerial ownership plays a significant role in determining the maturity structure of firms, in line with previous studies in this literature. However, Datta et al. (2005) and Guney and Ozkan (2005) find a negative relation between long-term debt and managerial ownership, whereas my results show a negative relation between short-term debt and managerial ownership. As explained above, my evidence may differ because I take into account potential endogeneity issues that may bias the estimated association. In addition, my panel data of ownership lets me exploit the intertemporal variation of ownership characteristics to obtain more robust estimates, an aspect that is explicitly neglected in Guney and Ozkan (2005).

My tests suggest that, in the presence of liquidity risk entailed in debt maturing within one year, managers prefer longer over shorter maturities, although increasing ownership aligns them to shareholders' interests. In this respect, this result provides evidence of a trade-off between the monitoring benefits of short-term debt and the costs of increased liquidity risk, extending Datta et al.'s (2005) finding of a positive relation between short-term debt and insider shareholding.

This result also provides support for the hypothesis that alternative control mechanisms are substitutes. Increasing ownership makes managers more aligned and reduces the pressure for lenders to engage in frequent monitoring actions such as the roll-over of short-term debt.

To further explore the relation between maturity and managerial ownership, I include a quadratic term in Table VI. Generally, in all the estimated models, there is a significant U-shaped relation between managerial ownership and short-term debt, suggesting that managers tend to lengthen the maturity of debt as their ownership in the firm increases. This is indicative

of an alignment effect, and is corroborated by the fact that this appears to coincide with blockholders' preferences. However, high levels of insider ownership may result in entrenched managers, who can expropriate external investors. In order to reduce negative repercussions, such as lower market evaluation of the firm's stocks, managers may tend to issue more short-term debt to signal to the market that they are not resorting to expropriation. Alternatively, external investors in the market may increase the pressure for higher levels of short-term debt if there is a potential threat of non value-maximizing actions by entrenched managers. The estimated turning points of the quadratic relation are at about 37% across all models in Table VI.<sup>11</sup> Data inspection reveals that a non-negligible 12% of companies feature executive ownership greater than 37%.<sup>12</sup>

Results in Table VI also reveal that the overall economic impact of *Executive Ownership* is lower than that of *Blockholding*. The partial derivative is  $-0.009$  plus  $(0.0001 \text{ times } 2)$ , or  $0.0088$  (Model 6). This implies that a one standard deviation increase reduces short debt by approximately 1.09% of its mean. Clearly, the impact changes depending on the amount of insider equity relative to the turning point. Up to the turning point each additional percentage of ownership decreases short-term debt with a diminishing rate. For instance, an increase in the equity position of *Executive Ownership* from the 25<sup>th</sup> percentile, 0.19, to the turning point, 38.1, is predicted to decrease the proportion of short-term debt by 1.4% (Model 6). At the turning point, an additional percentage of ownership would actually increase the proportion of short-term debt of about 0.04%.

Finally, I conduct additional tests by including a cubic term of *Executive Ownership* in the regressions, in line with previous studies on ownership and performance (e.g., Morck et al. (1988); Mura (2007)). Results show that the cubic form does not appear to enhance the explanatory power of the model. These alternative specifications are not reported for the sake of brevity.

### B.3. Board Composition

Estimates for both proxies of board composition show a negative sign in line with my prediction of a substitution relation among alternative monitoring mechanisms. Nonetheless, in all models only the separation between CEO and Chairman appears to be relevant in determining maturity decisions. The result may be interpreted as evidence that those firms that adopt a division of the roles at the head of the company give a signal of limited managerial discretion. Lasfer (2004) finds that compliance with this provision is value-enhancing, in particular for firms more exposed to managerial entrenchment. In our context, this positive

signal reduces the disciplinary role of shorter debt maturities. Further, our figures reveal that *Split* has a sizable economic impact. Specifically, those companies that separate the CEO and Chairman roles are predicted to lower short-term debt by around 16.5% of its mean (Model 6).

On the other hand, my analysis shows that a larger proportion of non-executive directors on the board (*Ratio*) does not appear to provide the market with the signal of better monitoring and performance of the firm. One possible explanation for this result is that non-executives do not have sufficient financial incentives to efficiently monitor executives (Jensen (1993)). Although in a different context, this is consistent with Faccio and Lasfer (2000) and Lasfer (2004), who find insignificant improvements in market performance from increasing the number of non-executives in the board.

To explore this aspect in more detail, I run two different tests. First, I include in the model the non-executives' shareholding in both linear and quadratic forms. Second, I substitute *Ratio* with only the proportion of non-executives who effectively own shares. Unreported results show insignificant findings in both analyses. This is consistent with Mura (2007), who shows that in the UK system, shares by non-executives do not have any impact on firm value.

Overall, the evidence presented in this paper strongly supports the idea that including blockholding and board composition in studies of firm maturity choices enhances our understanding of the determinants of debt maturity structure and the effects of liquidity risk on the maturity choice.

#### *B.4. Control variables*

I generally find that firms with higher growth opportunities (*Market-to-Book*) tend to have less short-term debt, consistent with the liquidity risk hypothesis; they tend to issue more long-term debt in an attempt to avoid inefficient liquidation of their riskier growth opportunities.<sup>13</sup> This finding is in line with Stohs and Mauer (1996), Johnson (2003), and Datta et al. (2005) for the US market; and with Schiantarelli and Sembenelli (1997) and Antoniou et al. (2006) for the UK. In line with these studies and with the theoretical predictions my tests show that larger firms seem to adopt more long-term debt. For robustness purposes, I also use alternative definitions for *Size*, that is, the logarithm of market value of equity (e.g., Barclay and Smith (1995)) and the logarithm of net sales in 1991 prices (Johnson (2003)). Unreported results are qualitatively similar to what shown here. Further, the coefficient for asset maturity is not significant, as in Datta et al. (2005) and Antoniou et al. (2006).

The liquidity risk hypothesis is supported also by the significant and negative results of *Leverage*, in line with Stohs and Mauer (1996), Johnson (2003), and Datta et al. (2005) for the

US companies and with Guney and Ozkan (2005) for the UK ones. Furthermore, the volatility of earnings (*Volatility*) is significant and negative in line with Johnson (2003). Results do not change significantly when I adopt an alternative definition of *Volatility*, that is, the standard deviation of the first differences of earnings over the six years preceding the sample year. On the contrary, *Rating* is not significant in any model, although its sign is in line with the prediction. This is probably due to the fact that very few UK firms were rated by an external agency during the 1990s (Table III). Therefore, the dummy *Rating* has a large number of zeros and thus a reduced variability. As an alternative for credit risk, I also use size and its square in line with Diamond's (1991) argument and Johnson's (2003) evidence. I expect these to show a negative and positive relation, respectively, with short-term debt. Unreported estimates seem in line with this expectation, although not significant at conventional levels.

In line with Ozkan (2002), my study fails to provide evidence supporting the signaling hypothesis that high quality firms use more short-term debt to signal their quality.

Finally, I find evidence of a significant relation between debt maturity and taxation, but not with the predicted sign. This result is in line with previous UK-based evidence (Ozkan (2000); Antoniou et al. (2006)). The proxy for the term structure (*Term Structure*), on the other hand, shows an insignificant impact on debt maturity. One possible reason is that this variable is market-based, that is, a shock in it would indistinguishably affect all the companies in the system. Therefore, by including firm-invariant time effect dummies in the regressions, I have already controlled for the potential impact of term structure on debt maturity decisions. This result is in line with Johnson (2003) when time dummies are included in the estimations.

### **III. Robustness checks**

#### *A. Largest Shareholders and Liquidity Risk*

One of the implications of Myers (1977) is that short-term debt maximizes firm value by reducing the underinvestment problem when managers act in shareholders' interests. Previous results show that when shareholders have large equity positions in the company and, thus, have less diversified portfolios, they tend to trade off underinvestment against increased liquidity risk issues by lengthening the maturity of debt. To further check the validity of these results, I perform a series of robustness tests here.

If the argument provided above is correct, I should find a stronger impact of blockholding in very high liquidity risk companies, than that in other companies. In companies more exposed to suboptimal liquidation problems, large, undiversified shareholders may push for even less short-term debt to reduce liquidity risks. To investigate this hypothesis, I define

several proxies for high-liquidity risk firms. In line with Diamond (1991), more leveraged companies are more exposed to liquidity risk. In addition, firms with large growth opportunities are likely to be harmed more in case of premature liquidation. Also, Johnson (2003) suggests that companies with more volatile cash flows are likely to experience more difficulties in repaying debt; while smaller firms are likely to be less diversified, which implies higher expected liquidity risk and bankruptcy costs.

Therefore, I build three separate dummies that are equal to one when a company is in the top quartile of the distributions of leverage, market-to-book value, and volatility and a further dummy equal to one when a company is in the bottom quartile of the distributions of size. Then, I interact these dummies with *Largest Non-Managerial Ownership*, which represents the most undiversified external blockholder, in four separate models. To the extent that the liquidity risk effect dominates, I expect the interaction dummy to have a negative and significant influence on short-term debt, which, in turn, represents an overall stronger impact of blockholding on debt maturity.

Results are reported in Table VII. The direct impact of *Largest Non-Managerial Ownership* is negative and significant as in previous regressions. Consistent with the liquidity risk hypothesis, the interaction terms are negative in most of the models and always jointly significant, as reported by the F-tests. In companies more exposed to liquidity risk problems, the overall impact of largest shareholders is negative and in most cases even stronger than for the entire sample (Models 10 through 12). For instance, in firms with highly volatile profits (Model 11) an increase of one standard deviation in the largest equity position is expected to reduce short-term debt by around 8.6% of its mean. Similar figures pertain to *Largest Non-Managerial Ownership* in small firms (Model 12). These findings support my previous evidence that the liquidity risk effect dominates the underinvestment.

From a monitoring point of view, the negative interaction terms seem to suggest that the controlling benefits provided by short-term debt are overshadowed by the expected high liquidity risk costs in this sub-sample of firms. A substitution relation between alternative monitoring instruments emerges from these results, as in the previous ones.

[INSERT TABLE VII HERE]

As a further robustness check, I replicate a similar analysis with the low liquidity risk companies. If the argument above holds, I would expect blockholding to have a lower impact on short-term debt decisions in those companies with low liquidity risk issues.

For the “low liquidity risk” dummy, I use the lowest quartile of the distributions of leverage, market-to-book, and volatility and the highest quartile for size. The results in Table

VIII show that the interaction terms are positive and jointly significant, as reported by the F-tests. In companies less exposed to potential suboptimal liquidation problems, the impact of blockholding is milder. For instance, in large firms (Model 16) a one standard deviation increase of *Largest Non-Managerial Ownership* may reduce short-term debt by about 4.3% compared to the 6.4% for the entire sample. That is, large shareholders are more inclined to having more short-term debt in large firms.

These results may also be interpreted from a monitoring point of view. In companies that are more exposed to managerial discretion issues, the liquidity risk costs may be outweighed by the monitoring benefits of large blockholding. Large shareholders may impose an additional monitoring device by further shortening the maturity of debt. For instance, when I analyze “Low Market-To-Book” companies (Model 14), which may be expected to suffer more from free cash flow problems (Jensen (1986)), the overall impact of *Largest Non-Managerial Ownership* is positive (-0.003+0.004). In other words, with reduced liquidity risk costs, more short-term debt may help blockholding to effectively monitor managerial behavior, reducing the potential costs of managerial entrenchment.

Interestingly, when I classify firms by the leverage distribution, results do not show any difference between the high and low liquidity risk group. In both cases the marginal impact of the largest shareholder is positive and jointly significant.

[INSERT TABLE VIII HERE]

To further examine the robustness of these results, I exclude from the above specifications Leverage, Market-to-Book, Volatility and Size and substitute them with the corresponding dummies for high/low liquidity risk firms. Results on the interaction terms are similar to those reported here. Further, I divide the sample into high and low liquidity risk companies according to the average value of the distribution for Leverage, Market-to-Book, Volatility and Size respectively. I find (but not report) that *Largest Non-Managerial Ownership* has no significantly different impact between high and low risk companies.

To sum up, all these results corroborate the argument that expected liquidity risk costs are a driving force for blockholding in choosing a particular maturity structure.

#### *B. Debt Maturity and Creditors' Identity*

As a final robustness test, I analyze the impact of creditors' identity. As Table IX shows, banks are the main lenders in the UK system. Around 58% (70) of the total debt in the average (median) company is provided by banks (*Bank Debt*). In terms of maturity, on average, 35% of short-term debt consists of bank debt (*STBK*), while in the median firm this figure is



about 25%. On the other hand, statistics on the identity of long-term debt lenders reveal that, in the average firm, bank debt accounts for 24% of long-term debt (*LTBK*), but for only 2% in the median firm. This suggests that most long-term debt consists of non-bank debt.

[INSERT TABLE IX HERE]

On the basis of these figures, it could be argued that the results on short-term debt in this work may be driven by creditors' identity and, thus, may capture a bank effect rather than a maturity effect. As a robustness check, in Table X I estimate the base model (Model 6) using long-term debt (the ratio of debt due after one year to total debt, *LGDEBT*) as a dependent variable instead of short-term maturity. If my previous findings really capture a maturity effect, then I should not detect any difference in the results, except for opposite estimated signs. Indeed, Table X Model 17 reports the same relations detected in earlier estimations, corroborating the argument that my estimations were not driven by creditors' identity.

Nonetheless, a simple algebraic reason may lead to the results in Model 17. Long-term debt is, in fact, the complement of short-term debt. Therefore, further investigations are necessary. In Model 18, I estimate again the base Model 6 with short-term debt as the dependent variable by including bank debt as a regressor (*Bank Debt*), to verify if the previous results still hold. The findings show that the negative relation with blockholding, the U-shaped relation with managerial ownership, and the negative influence of splitting the officers' roles remain unaffected by the presence of bank debt. Overall, this supports the argument that my findings are not driven by creditors' identity.

[INSERT TABLE X HERE]

#### **IV. Conclusions**

This study investigates the link between corporate debt maturity and both ownership structure and board composition.

I find a significant relation between short-term debt and blockholding. An increase of one standard deviation in blockholding reduces short-term debt by 6.5% of its mean. This is in line with the hypothesis that large shareholders may prefer longer maturities in the trade-off between underinvestment and liquidity risk. When I analyze different types of shareholders, I find that institutional and non-institutional owners both have a significant and negative impact on short-term debt. This supports the view that the largest, least diversified shareholders prefer longer maturities, regardless of the type of investor.

These results extend Johnson's (2003) findings that the liquidity risk entailed in shorter maturities is crucial in determining the optimal debt maturity structure. With respect to

blockholders' incentives, the liquidity risk seems to dominate the underinvestment. When I isolate sub-samples of high and low liquidity risk firms, I find corroborating evidence for this hypothesis. Large shareholders have a higher economic impact in the highly volatile and small companies sub-samples than in the entire sample, suggesting that, when expected liquidity risk costs are very high, shareholders opt for even less short-term debt. On the other hand, when the company faces lower liquidity risk, large shareholders have less of an influence on short maturities. These results also extend Diamond (1991) and Datta et al. (2005) by showing how the incentives of blockholders as well as insiders affect the relation between debt maturity and liquidity risk.

Looking at insider incentives, my results support the hypothesis that the link between insider ownership and debt maturity is non-linear. I find strong evidence of a U-shaped association. Moreover, results suggest that the link between insider ownership and maturity of debt is endogenous. In addition, my tests lend support to the hypothesis that board composition is relevant in determining debt maturity choices. In particular, findings indicate that the choice to separate the CEO from the Chairman exerts a significant influence in decreasing short-term debt by around 16.5% of its mean.

This evidence extends previous studies on the relation between maturity structure and managerial shareholding (Kim and Sorenson (1996); Datta et al. (2005); and Guney and Ozkan (2005)) by showing the significant economic impact of ownership by blockholders and board composition. These factors are expected to shape the equity agency costs inside the firm and they are eventually likely to influence the link between maturity and insider shareholding itself. Including them in debt maturity models improves our understanding of the multiple influences of equity agency conflicts on maturity decisions.

Finally, my results contribute to the literature on the interrelation between different control mechanisms (e.g., Jensen et al. (1992); Agrawal and Knoeber (1996); Crutchley et al. (1999)), by showing a substitution relation between short-term debt, on one hand, and ownership and governance characteristics, on the other.

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<sup>1</sup> A previous work by Kim and Sorenson (1986) analyses the relation between debt maturity and insider ownership, as well as Guney and Ozkan (2005). However, Datta et al. (2005) are the first that explicitly put this relation within Myers' (1977) framework creating a link between capital structure and corporate governance literatures.

<sup>2</sup> For instance, Binay (2002) reports that in the US market, the percentage of equity owned by domestic institutional owners increased from 35% in 1981 to 58% in 2002. Similar figures are reported by Blommestein and Funke (1998) for all OECD countries.

<sup>3</sup> Inspection of the GAAP for the UK and US reveals that the sharp difference I document cannot be explained by differences in Accounting Practices.

<sup>4</sup> Similarly, Datta et al. (2005) provide evidence that the average percentage of debt due within one year in the US is equal to 21.46% (Table I Panel A). Julio et al. (2007) recently show that only 25% of all US public debt issues in the last 30 years have a maturity within five years; while their proceeds account for about 40% of the total debt publicly raised (Table 1 Panels A and B, respectively).

<sup>5</sup> The reliance on bank debt may be a reason for the substantial use of short-term debt among UK companies, as documented in Table IX. However, the evidence in Section III reveals that my results are not sensitive when I control for the source of debt.

<sup>6</sup> I also separate the effect of bank ownership from all other financial institutions. However, in unreported robustness checks the estimates are always insignificant. This may be due to the limited portion of equities held by banks in the UK companies. My calculations reveal that the bank shareholding in the average UK firm is equal to 1.48% which is the lowest level held by financial institutions. Further, only 3% of firm-year observations show a bank as a largest owner; in contrast, more than 44% of firm-year observations feature an institutional investor as largest owner.

<sup>7</sup> According to UK company law, non-executives are responsible for both the company's business strategy (with the executives) and for assessing the performance of executives in implementing this strategy (Davies (2002)).

<sup>8</sup> Evidence of the dynamic determination of firms' debt maturity structure is provided by Ozkan (2000) and Antoniou et al. (2006).

<sup>9</sup> The Difference Sargan test approach works as follows: first, I use only instruments dated t-2 (strong endogeneity) for all variables and I calculate the corresponding Sargan test. Then, I add an instrument dated t-1 (weak endogeneity) for each variable at once in a number of subsequent regressions and I compute the corresponding Sargan tests. The set of instruments specified under the strong endogeneity assumption is a subset of those specified under the weak endogeneity assumption. If S denotes the Sargan statistics under the strong endogeneity assumption in the initial regression and S' the Sargan statistics under the weak endogeneity assumption in each subsequent

regression, the difference  $DS = S - S'$  tests the validity of the additional instrument in each regression and, thus, assesses the nature of the endogeneity for that particular regressor (Bond (2002)).

<sup>10</sup> By construction, the process of taking first differences introduces serial correlation of order one.

<sup>11</sup> For example, the inflexion point for the quadratic relation in Model 6 is calculated as the solution to the following equation:  $MAT = -0.009MAN + 0.0001MAN^2$ , where MAN stands for Executive Ownership for brevity reasons. I differentiate MAT with respect to MAN,  $\partial MAT / \partial MAN = -0.009 + 0.0002MAN$ ; I let  $\partial MAT / \partial MAN = 0$  and I solve for MAN.

<sup>12</sup> Among US-based studies that use long-term debt as leverage proxy, Friend and Lang (1988) report similar effects for low and high levels of insider shareholding and Wansley et al. (1996) show comparable turning points (approximately 40%) to those in my tests.

<sup>13</sup> As suggested in Stohs and Mauer (1996), I also ran the same regressions for all the specifications without controlling for leverage, but I obtained the same results reported here.



**Table I**  
**Median (Mean) Percentage of Total Debt That Matures at Different Times**  
**for Small and Large Firms in the UK and US**

This table shows the median (mean) percentage of total debt that matures at different times, categorized by firm size for the UK and US companies over the sample period, 1991-2001. *Size*, defined as the natural logarithm of total assets in 1991 prices, is used to separate small from large companies. Small companies are defined those below the median size for the total sample; *vice versa*, large companies are those above the median. Data for US companies were collected from *Compustat*; definitions follow Datta et al. (2005).

	UK		US	
<b>Maturities</b>	<i>Small firms</i>	<i>Large firms</i>	<i>Small firms</i>	<i>Large firms</i>
<b>due within 1 year</b>	0.72 (0.66)	0.34 (0.42)	0.03 (0.12)	0.03 (0.10)
<b>due between 2 and 5 years</b>	0.03 (0.20)	0.35 (0.37)	0.25 (0.32)	0.33 (0.37)
<b>due in more than 5 years</b>	0.09 (0.25)	0.11 (0.25)	0.38 (0.42)	0.45 (0.47)

**Table II**  
**Annual Descriptive Statistics for Ownership Variables**

This table shows the average ownership characteristics for 656 firms over the period 1991-2001. Panel A reports the percentage of shares held by non-managerial shareholders and executive directors. Panel B shows the average number of owners classified by category of owner. *Blockholding* is the total percentage of shares held by all large non-managerial shareholders with more than 5% of shares; *Largest Non-Managerial Ownership* is equal to the percentage of shares by the first non-managerial shareholder with more than 5% of shares; *Institutional Ownership* is the total percentage of shares held by investment companies, insurance companies and banks with more than 5% of shares; *Non-Institutional Ownership* represents the total percentage of shares held by non-financial corporations and individuals with more than 5% of shares; *Largest Institutional Ownership* is the percentage of shares by the first non-managerial shareholder when it is an institutional investor, insurance company or bank with more than 5% of shares; *Largest Non-Institutional Ownership* is equal to the percentage of shares by the first non-managerial shareholder when it is a non-financial company or an individual with more than 5% of shares; *Executive Ownership* represents the percentage of shares by executive directors; *Float* is the sum of the undisclosed shareholding, below the official threshold. Figures for these variables are calculated including also those companies where shareholders have less than 5% shares. This is the reason why some averages are below 5%. *Non-Managerial Shareholders* is the total number of external shareholders with more than 5% shares; *Institutional Investors* is the number of financial institutions with more than 5% shares; *Non-Institutional Investors* is the number of non-financial institutions, private individuals, other non-financial companies with more than 5% shares; *Executive Directors* is the total number of executive directors; *Non-Executive Directors* is the total number of non-executive directors; *Ratio* is the proportion of non-executive directors on total board; *Split* is a dummy equal to 1 if there is separation between CEO and Chairman (figures below represent the percentage of firms with *Split*=1).

<i>Panel A: Average percentage of ordinary shares held by non-managerial shareholders and executive directors</i>											
	1991 <sup>a</sup>	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
(%)											
<i>Blockholding</i>	21.86	23.26	23.62	21.88	22.25	22.99	24.38	25.08	25.89	25.85	24.45
<i>Largest Non-Managerial Ownership</i>	9.46	9.49	9.81	10.11	10.33	10.73	11.00	11.37	11.00	12.20	11.68
<i>Institutional Ownership</i>	13.41	15.44	15.71	14.92	15.15	16.49	17.23	18.08	18.09	17.88	16.30
<i>Non-Institutional Ownership</i>	8.45	7.82	7.91	6.96	7.10	6.50	7.15	7.00	7.80	7.97	8.15
<i>Largest Institutional Ownership</i>	5.15	5.78	5.66	6.33	6.57	7.31	7.39	7.78	7.29	7.57	7.35
<i>Largest Non-Institutional Ownership</i>	4.31	3.71	4.15	3.78	3.76	3.42	3.61	3.59	3.71	4.63	4.33
<i>Executive Ownership</i>	14.51	12.75	12.02	11.10	10.53	9.53	9.62	9.13	8.98	8.38	8.26
<i>Float</i>	60.96	52.49	51.93	56.59	56.47	56.81	55.53	56.00	54.92	56.25	57.07
<i>Panel B: Ownership composition: Average number of owners for each category</i>											
<i>Number of owners</i>											
<i>Non-Managerial Shareholders</i>	2.20	2.44	2.48	2.15	2.13	2.22	2.37	2.42	2.53	2.44	2.34
<i>Institutional Investors</i>	1.51	1.77	1.84	1.59	1.57	1.69	1.77	1.83	1.87	1.83	1.67
<i>Non-Institutional Investors</i>	0.69	0.68	0.64	0.56	0.56	0.53	0.60	0.59	0.65	0.61	0.67
<i>Executive Directors</i>	4.71	4.59	4.47	4.33	4.26	4.17	4.09	4.09	4.01	4.00	3.90
<i>Non-Executive Directors</i>	2.33	2.47	2.69	2.78	3.04	3.12	3.22	3.26	3.36	3.41	3.50
<i>Ratio</i>	0.33	0.35	0.38	0.39	0.42	0.43	0.44	0.44	0.46	0.46	0.47
<i>Split (%)</i>	83.90	85.12	86.99	88.46	90.42	91.05	90.60	92.61	92.56	91.55	93.03
<i>Total sample firms</i>	503	531	561	598	637	637	638	582	497	426	373

<sup>a</sup> In 1991 my source of data still reported figures with a 5% threshold, so *Float* is not directly comparable to the following years.

**Table III**  
**Descriptive Statistics over the Entire Sample Period**

This table shows the economic characteristics for 656 firms over the period 1991-2001. *MAT* is the ratio of debt repayable within one year to total debt; *Market-to-Book* is equal to the ratio of market value of total assets to book value of total assets, where market value of total assets is defined as the book value of firm's assets plus the difference between the market value and the book value of equities; *Size* is defined as the natural logarithm of total assets in 1991 prices; *Asset Maturity* is the ratio of total fixed assets to annual depreciation, where total fixed assets represent the net total of land and buildings, plant and machinery, construction in progress and other fixed assets; *Leverage* is the ratio of total debt to total assets; *Volatility* is equal to earnings before taxes and depreciation over the four years preceding the sample year, divided by average assets for that period; *Quality* is the growth rate of earnings, defined as the difference between the pre-tax profits in t+1 and the pre-tax profits in t divided by the pre-tax profits in t; *Tax* is the total tax ratio, defined as total tax charge divided by pre-tax profits; *Term Structure* is defined as the difference between the yields on 10-years government bonds and the three-months Treasury bills; *Blockholding* is the total percentage of shares held by all large non-managerial shareholders with more than 5% of shares; *Herfindahl Index* is the sum of all squared equity positions by non-managerial shareholders; *Largest Non-Managerial Ownership* is equal to the percentage of shares by the first non-managerial shareholder with more than 5% of shares; *Institutional Ownership* is the total percentage of shares held by investment companies, insurance companies and banks with more than 5% of shares; *Non-Institutional Ownership* represents the total percentage of shares held by non-financial corporations and individuals with more than 5% of shares; *Largest Institutional Ownership* is the percentage of shares by the first non-managerial shareholder when it is an institutional investor, insurance company or bank with more than 5% of shares; *Largest Non-Institutional Ownership* is equal to the percentage of shares by the first non-managerial shareholder when it is a non-financial company or an individual with more than 5% of shares; *Executive Ownership* represents the percentage of shares by executive directors; *Ratio* is the proportion of non-executive directors on total board; *Rating* is a dummy equal to 1 if a company is rated and zero otherwise; *Split* is a dummy equal to 1 if there is separation between CEO and Chairman and zero otherwise.

Variable	Mean	Std. Dev.	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile	Total observations
<i>MAT</i>	0.54	0.34	0.24	0.50	0.91	5983
<i>Market-to-Book</i>	1.57	0.94	1.01	1.32	1.82	5983
<i>Size</i>	11.26	1.83	9.95	11.04	12.41	5983
<i>Asset Maturity</i>	9.94	8.31	5.56	7.92	10.82	5983
<i>Leverage</i>	0.17	0.13	0.06	0.16	0.25	5983
<i>Volatility</i>	0.07	0.06	0.03	0.05	0.08	5983
<i>Quality</i>	-0.10	1.79	-0.37	0.07	0.33	5983
<i>Tax</i>	26.16	19.12	22.06	30.22	33.81	5983
<i>Term Structure</i>	0.54	0.34	0.24	0.50	0.91	
<i>Blockholding</i>	23.44	17.71	8.55	21.09	35.49	5983
<i>Herfindahl Index</i>	822.98	781.83	393.72	548.23	886.49	5983
<i>Largest Non-Managerial Ownership</i>	10.55	11.61	0.00	9.11	14.90	5983
<i>Institutional Ownership</i>	16.13	15.18	5.00	12.70	25.75	5983
<i>Non-Institutional Ownership</i>	7.43	12.65	0.00	0.00	10.00	5983
<i>Largest Institutional Ownership</i>	6.70	9.08	0.00	0.00	11.80	5983
<i>Largest Non-Institutional Ownership</i>	3.84	10.19	0.00	0.00	0.00	5983
<i>Executive Ownership</i>	9.98	15.63	0.19	2.07	13.36	5983
<i>Ratio</i>	0.41	0.16	0.33	0.42	0.50	5983
Percentage of firms with <i>Rating</i> =1	3.34					
Percentage of firms with <i>Split</i> =1	89.66					

**Table IV**  
**Pearson Correlations among Debt Maturity, Ownership Variables,**  
**Market-to-Book, Leverage and Rating**

This table reports Pearson correlations for 656 firms over the period 1991-2001. *MAT* is the ratio of debt repayable within one year to total debt; *Blockholding* is the sum of all large external shareholders with more than 5% of shares; *Herfindahl Index* is the sum of all squared equity positions by non-managerial shareholders; *Largest Non-Managerial Ownership* is the shares held by the largest non-managerial shareholder with at least 5% shares; *Institutional Ownership* is the sum of the shares held by institutional investors, insurance companies and banks with more than 5% shares; *Non-Institutional Ownership* is the sum of the shares held by corporations and individuals with more than 5% shares; *Largest Institutional Ownership* is the shares held by the first non-managerial shareholder when it is either an institutional investor or an insurance company or a bank with more than 5% shares; *Largest Non-Institutional Ownership* is the shares held by the first non-managerial shareholder when it is either a corporation or an individual with more than 5% shares; *Executive Ownership* is the percentage of shares held by executive directors; *Executive Ownership*<sup>2</sup> is the square of *Executive Ownership*; *Split* is a dummy equal to 1 if there is separation between CEO and Chairman and zero otherwise; *Ratio* is equal to the proportion of non-executives to total number of directors; *Market-to-Book* is equal to the ratio of market value of total assets to book value of total assets, where market value of total assets is defined as the book value of firm's assets plus the difference between the market value and the book value of equities; *Leverage* is the ratio of total debt to total assets; *Rating* is a dummy equal to 1 if a company is rated and zero otherwise. \*\*\* indicates statistical significance at the 1%

*Panel A: Pearson Correlations among Debt Maturity and Ownership Variables*

	<i>MAT</i>	<i>Blockholding</i>	<i>Herfindahl Index</i>	<i>Largest Non-Managerial Ownership</i>	<i>Institutional Ownership</i>	<i>Non-Institutional Ownership</i>	<i>Largest Institutional Ownership</i>	<i>Largest Non-Institutional Ownership</i>	<i>Executive Ownership</i>	<i>Executive Ownership</i> <sup>2</sup>	<i>Split</i>	<i>Ratio</i>
<i>MAT</i>	1.00											
<i>Blockholding</i>	0.06***	1.00										
<i>Herfindahl Index</i>	0.10***	0.29***	1.00									
<i>Largest Non-Managerial Ownership</i>	-0.04***	0.73***	0.37***	1.00								
<i>Institutional Ownership</i>	-0.001	0.71***	0.04***	0.42***	1.00							
<i>Non-Institutional Ownership</i>	0.08***	0.54***	0.37***	0.51***	-0.20***	1.00						
<i>Largest Institutional Ownership</i>	-0.07***	0.44***	0.05***	0.54***	0.74***	-0.28***	1.00					
<i>Largest Non-Institutional Ownership</i>	0.01	0.44***	0.38***	0.66***	-0.18***	0.83***	-0.28***	1.00				
<i>Executive Ownership</i>	0.19***	-0.23***	0.55***	-0.36***	-0.24***	-0.03	-0.31***	-0.13***	1.00			
<i>Executive Ownership</i> <sup>2</sup>	0.16***	-0.24***	0.63***	-0.30***	-0.22***	-0.07***	-0.25***	-0.12***	0.93***	1.00		
<i>Split</i>	-0.004	0.07***	-0.09***	0.10***	0.04***	0.05***	0.07***	0.05***	-0.19***	-0.15***	1.00	
<i>Ratio</i>	-0.16***	0.10***	-0.01	0.20***	0.06***	0.07***	0.10***	0.14***	-0.39***	-0.29***	0.07***	1.00

*(continued)*

**Table IV-Continued**

*Panel B: Pearson Correlations among Debt Maturity, Market-to-Book, Leverage and Rating*

	<i><b>MAT</b></i>	<i><b>Market-to-Book</b></i>	<i><b>Leverage</b></i>	<i><b>Rating</b></i>
<i><b>MAT</b></i>	1.00			
<i><b>Market-to-Book</b></i>	0.05***	1.00		
<i><b>Leverage</b></i>	-0.31***	-0.14	1.00	
<i><b>Rating</b></i>	-0.07***	0.05***	0.09***	1.00

**Table V**  
**OLS, WG and GMM Results**

This table includes OLS, WG and GMM estimations for a sample of 656 firms between 1991 and 2001. The dependent variable is the ratio of debt repayable within one year to total debt (*MAT*); *Blockholding* is the sum of all large external shareholders with more than 5% of shares; *Executive Ownership* is the total share of ownership held by executive directors; *Split* is a dummy equal to 1 if there is separation between CEO and Chairman and zero otherwise; *Ratio* is equal to the proportion of non-executives to total number of directors; *Market-to-Book* is equal to the ratio of market value of total assets to book value of total assets, where market value of total assets is defined as the book value of firm's assets plus the difference between the market value and the book value of equities; *Size* is defined as the natural logarithm of total assets in 1991 prices; *Asset Maturity* is the ratio of total fixed assets to annual depreciation, where total fixed assets represent the net total of land and buildings, plant and machinery, construction in progress and other fixed assets; *Leverage* is the ratio of total debt to total assets; *Rating* is a dummy equal to 1 if a company is rated and zero otherwise; *Volatility* is equal to the standard deviation of the first differences of earnings before taxes and depreciation over the four years preceding the sample year, divided by average assets for that period; *Quality* is the growth rate of earnings, defined as the difference between the pre-tax profits in t+1 and the pre-tax profits in t divided by the pre-tax profits in t; *Tax* is the total tax ratio, defined as total tax charge divided by pre-tax profits; *Term Structure* is defined as the difference between the yields on 10-years government bonds and the three-months Treasury bills. GMM model is in first differences with levels dated [t-2] of *MAT*, *Leverage*, and *Size* and [t-1, t-2] of all other regressors as instruments. Time dummies are always included. Asymptotic standard errors robust to heteroskedasticity are used in the estimations. Sargan test is a test of overidentifying restrictions, distributed as chi-square under the null of instrument validity; m1 and m2 test for first and second order autocorrelation in residuals; *P*-values are reported in parentheses. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% level, respectively.

<i>MAT</i>		OLS	WG	GMM
		(1)	(2)	(3)
Independent variables	Predicted signs	Coeff.	Coeff.	Coeff.
<i>MAT<sub>t-1</sub></i>	+	0.695*** (0.000)	0.330*** (0.000)	0.482*** (0.000)
<i>Blockholding</i>	-	0.001*** (0.000)	-0.001* (0.096)	-0.002* (0.054)
<i>Executive Ownership</i>	-	0.002*** (0.000)	0.0004 (0.412)	-0.002** (0.038)
<i>Split</i>	-	0.055*** (0.000)	0.016 (0.306)	-0.081** (0.046)
<i>Ratio</i>	-	0.03 (0.176)	0.048 (0.153)	-0.01 (0.893)
<i>Market-to-Book</i>	+/-	0.008** (0.031)	-0.001 (0.798)	-0.046** (0.012)
<i>Size</i>	-	0.008*** (0.000)	-0.057*** (0.000)	-0.187*** (0.000)
<i>Asset Maturity</i>	-	-0.002*** (0.000)	-0.001 (0.573)	-0.001 (0.463)
<i>Leverage</i>	-	-0.258*** (0.000)	-0.297*** (0.000)	-0.343** (0.033)
<i>Rating</i>	-	-0.024 (0.224)	0.003 (0.912)	-0.148 (0.224)
<i>Volatility</i>	-	0.168*** (0.004)	0.022 (0.725)	-0.151 (0.138)
<i>Quality</i>	+	-0.008*** (0.000)	-0.005*** (0.004)	-0.005* (0.078)
<i>Tax</i>	+	0 (0.453)	-0.000* (0.056)	-0.001*** (0.003)
<i>Term Structure</i>	-	0.002 (0.344)	0.003 (0.220)	0.001 (0.913)
<b>No. of firms</b>		656	656	656
<b>No. of obs</b>		5983	5983	5983
<b>Sargan test</b>				148.48 (0.714)
<b>m1</b>				-11.59*** (0.000)
<b>m2</b>				1.38 (0.170)

**Table VI**  
**Regressions in Two-Step Robust GMM**

This table includes GMM estimations for a sample of 656 firms between 1991 and 2001. The dependent variable is the ratio of debt repayable within one year to total debt (*MAT*); *Blockholding* is the sum of all large external shareholders with more than 5% of shares; *Herfindahl Index* is the sum of all squared equity positions by non-managerial shareholders; *Largest Non-Managerial Ownership* is the shares held by the largest non-managerial shareholder with at least 5% shares; *Institutional Ownership* is the sum of the shares held by institutional investors, insurance companies and banks with more than 5% shares; *Non-Institutional Ownership* is the sum of the shares held by corporations and individuals with more than 5% shares; *Largest Institutional Ownership* is the shares held by the first non-managerial shareholder when it is either an institutional investor or an insurance company or a bank with more than 5% shares; *Largest Non-Institutional Ownership* is the shares held by the first non-managerial shareholder when it is either a corporation or an individual with more than 5% shares; *Executive Ownership* is the percentage of shares held by executive directors; *Executive Ownership*<sup>2</sup> is the square of *Executive Ownership*; *Split* is a dummy equal to 1 if there is separation between CEO and Chairman and zero otherwise; *Ratio* is equal to the proportion of non-executives to total number of directors; *Market-to-Book* is equal to the ratio of market value of total assets to book value of total assets, where market value of total assets is defined as the book value of firm's assets plus the difference between the market value and the book value of equities; *Size* is defined as the natural logarithm of total assets in 1991 prices; *Asset Maturity* is the ratio of total fixed assets to annual depreciation, where total fixed assets represent the net total of land and buildings, plant and machinery, construction in progress and other fixed assets; *Leverage* is the ratio of total debt to total assets; *Rating* is a dummy equal to 1 if a company is rated and zero otherwise; *Volatility* is equal to the standard deviation of the first differences of earnings before taxes and depreciation over the four years preceding the sample year, divided by average assets for that period; *Quality* is the growth rate of earnings, defined as the difference between the pre-tax profits in t+1 and the pre-tax profits in t divided by the pre-tax profits in t; *Tax* is the total tax ratio, defined as total tax charge divided by pre-tax profits; *Term Structure* is defined as the difference between the yields on 10-years government bonds and the three-months Treasury bills. GMM models are in first differences with levels dated [t-2] of *MAT*, *Leverage*, and *Size* and [t-1, t-2] of all other regressors as instruments. Time dummies are always included. Asymptotic standard errors robust to heteroskedasticity are used in the estimations. Sargan test is a test of overidentifying restrictions, distributed as chi-square under the null of instrument validity; m1 and m2 test for first and second order autocorrelation in residuals; Tp is inflexion point for the U-shaped relation of *Executive Ownership*. P-values are reported in parentheses. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% level, respectively.

<i>MAT</i>		(4)	(5)	(6)	(7)	(8)
Independent variables	Predicted signs	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
<i>MAT</i> <sub>t-1</sub>	+	0.452*** (0.000)	0.443*** (0.000)	0.427*** (0.000)	0.458*** (0.000)	0.429*** (0.000)
<i>Blockholding</i>	-	-0.002** (0.028)				
<i>Herfindahl Index</i>	-		-0.00005** (0.033)			
<i>Largest Non-Managerial Ownership</i>	-			-0.003* (0.063)		
<i>Institutional Ownership</i>	+/-				-0.001 (0.331)	
<i>Non-Institutional Ownership</i>	-				-0.002* (0.086)	
<i>Largest Institutional Ownership</i>	+/-					-0.002* (0.078)
<i>Largest Non-Institutional Ownership</i>	-					-0.002* (0.095)
<i>Executive Ownership</i>	-	-0.008*** (0.007)	-0.009*** (0.007)	-0.009*** (0.004)	-0.007** (0.010)	-0.009*** (0.003)
<i>Executive Ownership</i> <sup>2</sup>	+	0.0001*** (0.010)	0.0001*** (0.004)	0.0001*** (0.006)	0.0001** (0.012)	0.0001*** (0.004)
<i>Split</i>	-	-0.084** (0.043)	-0.104** (0.016)	-0.089** (0.034)	-0.078* (0.059)	-0.094** (0.030)
<i>Ratio</i>	-	-0.039 (0.596)	-0.028 (0.737)	-0.044 (0.552)	-0.014 (0.853)	-0.029 (0.693)

(continued)

**Table VI-Continued**

<b>Market-to-Book</b>	+/-	-0.037** (0.038)	-0.033* (0.058)	-0.041** (0.031)	-0.033** (0.044)	-0.038** (0.035)
<b>Size</b>	-	-0.170*** (0.000)	-0.164*** (0.001)	-0.167*** (0.001)	-0.158*** (0.001)	-0.161*** (0.001)
<b>Asset Maturity</b>	-	0.0002 (0.910)	-0.001 (0.549)	0.0001 (0.984)	0.0001 (0.926)	0.0001 (0.996)
<b>Leverage</b>	-	-0.310** (0.041)	-0.336** (0.036)	-0.341** (0.029)	-0.266* (0.071)	-0.331** (0.025)
<b>Rating</b>	-	-0.114 (0.358)	-0.13 (0.344)	-0.072 (0.571)	-0.111 (0.392)	-0.092 (0.432)
<b>Volatility</b>	-	-0.171* (0.088)	-0.195* (0.065)	-0.198** (0.040)	-0.171* (0.073)	-0.188** (0.041)
<b>Quality</b>	+	-0.002 (0.345)	-0.003 (0.226)	-0.003 (0.315)	-0.002 (0.352)	-0.003 (0.245)
<b>Tax</b>	+	-0.001*** (0.004)	-0.001*** (0.001)	-0.001*** (0.002)	-0.001** (0.011)	-0.001*** (0.003)
<b>Term Structure</b>	-	0.003 (0.725)	0.002 (0.797)	0.003 (0.708)	0.002 (0.811)	0.002 (0.820)
<b>No. of firms</b>		656	656	656	656	656
<b>No. of obs</b>		5983	5983	5983	5983	5983
<b>Sargan test</b>		179.44 (0.414)	190.77 (0.211)	181.80 (0.366)	208.94 (0.205)	196.50 (0.417)
<b>m1</b>		-11.19*** (0.000)	-11.48*** (0.000)	-11.09*** (0.000)	-11.01*** (0.000)	-11.04*** (0.000)
<b>m2</b>		1.19 (0.236)	0.79 (0.427)	1.02 (0.307)	1.15 (0.250)	1.03 (0.301)
<b>Tp</b>		37.07	29.93	38.1	36.5	36.73



Table VII

**High-Liquidity Risk Firms and Largest Non-Managerial Ownership**

This table includes GMM estimations for Model 6 augmented by the interaction terms with *Largest Non-Managerial Ownership*. The sample consists of 656 firms between 1991 and 2001. The dependent variable is the ratio of debt repayable within one year to total debt (*MAT*); *Largest Non-Managerial Ownership* is the shares held by the largest non-managerial shareholder with at least 5% shares; *HLEV* is a dummy equal to 1 if the firm is in the top quartile of the *Leverage* distribution; *HMTBV* is a dummy equal to 1 if the firm is in the top quartile of the market-to-book distribution; *HVOL* is a dummy equal to 1 if the firm is in the top quartile of *Volatility* distribution; *LSIZE* is a dummy equal to 1 if the firm is in the bottom quartile of *SIZE* distribution; *Executive Ownership* is the total share of ownership held by executive directors; *Executive Ownership*<sup>2</sup> is the square of *Executive Ownership*; *Split* is a dummy equal to 1 if there is separation between CEO and Chairman and zero otherwise; *Ratio* is equal to the proportion of non-executives to total number of directors; *Market-to-Book* is equal to the ratio of market value of total assets to book value of total assets, where market value of total assets is defined as the book value of firm's assets plus the difference between the market value and the book value of equities; *Size* is defined as the natural logarithm of total assets in 1991 prices; *Asset Maturity* is the ratio of total fixed assets to annual depreciation, where total fixed assets represent the net total of land and buildings, plant and machinery, construction in progress and other fixed assets; *Leverage* is the ratio of total debt to total assets; *Rating* is a dummy equal to 1 if a company is rated and zero otherwise; *Volatility* is equal to the standard deviation of the first differences of earnings before taxes and depreciation over the four years preceding the sample year, divided by average assets for that period; *Quality* is the growth rate of earnings, defined as the difference between the pre-tax profits in t+1 and the pre-tax profits in t divided by the pre-tax profits in t; *Tax* is the total tax ratio, defined as total tax charge divided by pre-tax profits; *Term Structure* is defined as the difference between the yields on 10-years government bonds and the three-months Treasury bills. GMM models are in first differences with levels dated [t-2] of *MAT*, *Leverage*, and *Size* and [t-1, t-2] of all other regressors as instruments. In all models time dummies are included. Asymptotic standard errors robust to heteroskedasticity are used in the estimations. Sargan test is a test of overidentifying restrictions, distributed as chi-square under the null of instrument validity; m1 and m2 test for first and second order autocorrelation in residuals; F-test is a test on the joint significance of *Largest Non-Managerial Ownership* and interaction terms; Tp is inflexion point for *Executive Ownership*. P-values are reported in parentheses. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% level, respectively.

<i>MAT</i>		High Leverage (9)	High Market-to-Book (10)	High Volatility (11)	Small Size (12)
Independent variables	Predicted signs	Coeff.	Coeff.	Coeff.	Coeff.
<i>MAT</i> <sub>t-1</sub>	+	0.403*** (0.000)	0.437*** (0.000)	0.417*** (0.000)	0.433*** (0.000)
<i>Largest Non-Managerial Ownership</i>	-	-0.003** (0.036)	-0.002 (0.115)	-0.003* (0.071)	-0.003* (0.050)
<i>HLEV* Largest Non-Managerial Ownership</i>	-	0.002 (0.132)			
<i>HMTBV* Largest Non-Managerial Ownership</i>	-		-0.001 (0.319)		
<i>HVOL* Largest Non-Managerial Ownership</i>	-			-0.001 (0.500)	
<i>LSIZE* Largest Non-Managerial Ownership</i>	-				-0.001 (0.685)
<i>Executive Ownership</i>	-	-0.009*** (0.003)	-0.008*** (0.007)	-0.009*** (0.002)	-0.009*** (0.004)
<i>Executive Ownership</i> <sup>2</sup>	+	0.0001*** (0.006)	0.0001** (0.010)	0.0001*** (0.003)	0.0001*** (0.009)
<i>Split</i>	-	-0.086** (0.046)	-0.077* (0.071)	-0.074* (0.080)	-0.080* (0.059)
<i>Ratio</i>	-	-0.034 (0.638)	-0.036 (0.628)	-0.04 (0.592)	-0.062 (0.420)
<i>Market-to-Book</i>	+/-	-0.037* (0.051)	-0.041** (0.026)	-0.039** (0.040)	-0.044** (0.021)
<i>Size</i>	-	-0.155*** (0.001)	-0.157*** (0.002)	-0.156*** (0.003)	-0.193*** (0.000)
<i>Asset Maturity</i>	-	0.001 (0.823)	0.001 (0.984)	-0.001 (0.632)	0.0001 (0.892)
<i>Leverage</i>	-	-0.419*** (0.008)	-0.367** (0.019)	-0.401** (0.011)	-0.234 (0.131)

(continued)

**Table VII-Continued**

<i>Rating</i>	-	-0.045 (0.700)	-0.1 (0.420)	-0.064 (0.622)	-0.116 (0.352)
<i>Volatility</i>	-	-0.205** (0.027)	-0.212** (0.023)	-0.135 (0.178)	-0.219** (0.023)
<i>Quality</i>	+	-0.002 (0.417)	-0.003 (0.302)	-0.003 (0.205)	-0.002 (0.438)
<i>Tax</i>	+	-0.001*** (0.003)	-0.001*** (0.003)	-0.001*** (0.004)	-0.001*** (0.003)
<i>Term Structure</i>	-	0.004 (0.608)	0.001 (0.893)	0.002 (0.791)	0.002 (0.823)
<b>No. of firms</b>		656	656	656	656
<b>No. of obs</b>		5983	5983	5983	5983
<b>Sargan test</b>		199.91 (0.351)	207.22 (0.229)	205.18 (0.261)	202.42 (0.307)
<b>m1</b>		-10.85*** (0.000)	-10.88 *** (0.000)	-10.87*** (0.000)	-10.94*** (0.000)
<b>m2</b>		0.91 (0.363)	1.03 (0.304)	0.96 (0.338)	1.06 (0.288)
<b>F-test</b>		2.44* (0.088)	2.56* (0.078)	2.37* (0.094)	2.28 (0.102)
<b>Tp</b>		38.41	37.13	37.51	39.4

Table VIII

**Low-Liquidity Risk Firms and Largest Non-Managerial Ownership**

This table includes GMM estimations for Model 6 augmented by the interaction terms with *Largest Non-Managerial Ownership*. The sample consists of 656 firms between 1991 and 2001. The dependent variable is the ratio of debt repayable within one year to total debt (*MAT*); *Largest Non-Managerial Ownership* is the shares held by the largest non-managerial shareholder with at least 5% shares; *LLEV* is a dummy equal to 1 if the firm is in the bottom quartile of the *Leverage* distribution; *LMTBV* is a dummy equal to 1 if the firm is in the bottom quartile of the market-to-book distribution; *LVOL* is a dummy equal to 1 if the firm is in the bottom quartile of *Volatility* distribution; *HSIZE* is a dummy equal to 1 if the firm is in the top quartile of *SIZE* distribution; *Executive Ownership* is the total share of ownership held by executive directors; *Executive Ownership*<sup>2</sup> is the square of *Executive Ownership*; *Split* is a dummy equal to 1 if there is separation between CEO and Chairman and zero otherwise; *Ratio* is equal to the proportion of non-executives to total number of directors; *Market-to-Book* is equal to the ratio of market value of total assets to book value of total assets, where market value of total assets is defined as the book value of firm's assets plus the difference between the market value and the book value of equities; *Size* is defined as the natural logarithm of total assets in 1991 prices; *Asset Maturity* is the ratio of total fixed assets to annual depreciation, where total fixed assets represent the net total of land and buildings, plant and machinery, construction in progress and other fixed assets; *Leverage* is the ratio of total debt to total assets; *Rating* is a dummy equal to 1 if a company is rated and zero otherwise; *Volatility* is equal to the standard deviation of the first differences of earnings before taxes and depreciation over the four years preceding the sample year, divided by average assets for that period; *Quality* is the growth rate of earnings, defined as the difference between the pre-tax profits in t+1 and the pre-tax profits in t divided by the pre-tax profits in t; *Tax* is the total tax ratio, defined as total tax charge divided by pre-tax profits; *Term Structure* is defined as the difference between the yields on 10-years government bonds and the three-months Treasury bills. GMM models are in first differences with levels dated [t-2] of *MAT*, *Leverage*, and *Size* and [t-1, t-2] of all other regressors as instruments. In all models time dummies are included. Asymptotic standard errors robust to heteroskedasticity are used in the estimations. Sargan test is a test of overidentifying restrictions, distributed as chi-square under the null of instrument validity; m1 and m2 test for first and second order autocorrelation in residuals; F-test is a test on the joint significance between *Largest Non-Managerial Ownership* and interaction terms; Tp is inflexion point for *Executive Ownership*. P-values are reported in parentheses. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% level, respectively.

<i>MAT</i>		Low Leverage (13)	Low Market-to-Book (14)	Low Volatility (15)	Large Size (16)
Independent variables	Predicted signs	Coeff.	Coeff.	Coeff.	Coeff.
<i>MAT</i> <sub>t-1</sub>	+	0.409*** (0.000)	0.420*** (0.000)	0.431*** (0.000)	0.419*** (0.000)
<i>Largest Non-Managerial Ownership</i>	-	-0.003** (0.025)	-0.003* (0.031)	-0.002* (0.082)	-0.003* (0.056)
<i>LLEV* Largest Non-Managerial Ownership</i>	+	0.002 (0.211)			
<i>LMTBV* Largest Non-Managerial Ownership</i>	+		0.004*** (0.004)		
<i>LVOL* Largest Non-Managerial Ownership</i>	+			0.0002 (0.816)	
<i>HSIZE* Largest Non-Managerial Ownership</i>	+				0.001 (0.653)
<i>Executive Ownership</i>	-	-0.010*** (0.001)	-0.008*** (0.008)	-0.009*** (0.003)	-0.009*** (0.005)
<i>Executive Ownership</i> <sup>2</sup>	+	0.0001*** (0.002)	0.0001*** (0.009)	0.0001*** (0.004)	0.0001*** (0.006)
<i>Split</i>	-	-0.079* (0.065)	-0.078* (0.071)	-0.087** (0.048)	-0.081* (0.057)
<i>Ratio</i>	-	-0.059 (0.428)	-0.056 (0.448)	-0.028 (0.711)	-0.052 (0.473)
<i>Market-to-Book</i>	+/-	-0.042** (0.034)	-0.037* (0.055)	-0.038** (0.044)	-0.042** (0.036)
<i>Size</i>	-	-0.160*** (0.002)	-0.156*** (0.002)	-0.164*** (0.001)	-0.161*** (0.002)
<i>Asset Maturity</i>	-	0.001 (0.730)	0.001 (0.632)	0.001 (0.728)	0.0001 (0.960)
<i>Leverage</i>	-	-0.350** (0.027)	-0.368** (0.020)	-0.340** (0.029)	-0.385** (0.016)

(continued)

**Table VIII - Continued**

<i>Rating</i>	-	-0.065 (0.598)	-0.083 (0.499)	-0.022 (0.861)	0.037 (0.731)
<i>Volatility</i>	-	-0.224** (0.023)	-0.203** (0.035)	-0.234** (0.018)	-0.192** (0.043)
<i>Quality</i>	+	-0.003 (0.287)	-0.002 (0.382)	-0.003 (0.200)	-0.003 (0.267)
<i>Tax</i>	+	-0.001*** (0.002)	-0.001*** (0.002)	-0.001*** (0.002)	-0.001*** (0.002)
<i>Term Structure</i>	-	0.002 (0.834)	0.005 (0.575)	0.0001 (0.995)	0.001 (0.909)
<b>No. of firms</b>		656	656	656	656
<b>No. of obs</b>		5983	5983	5983	5983
<b>Sargan test</b>		199.49 (0.359)	197.90 (0.389)	203.21 (0.293)	198.37 (0.380)
<b>m1</b>		-10.83*** (0.000)	-11.04 *** (0.000)	-11.04*** (0.000)	-10.96*** (0.000)
<b>m2</b>		0.85 (0.393)	1.06 (0.290)	0.98 (0.325)	0.89 (0.371)
<b>F-test</b>		2.75* (0.065)	5.93*** (0.003)	1.52 (0.218)	2.30* (0.10)
<b>Tp</b>		37.54	36.7	37.55	36.9

**Table IX**  
**Descriptive Statistics for Bank Debt**

This table shows the characteristics of bank debt for 656 firms over the period 1991-2001. *STBK* is defined as the ratio of bank debt repayable within one year to total debt repayable within one year; *LTBK* is the ratio of bank debt due in more than one year to total debt repayable in more than one year; *Bank Debt* is equal to the ratio of bank debt to total debt.

Variable	Mean	Std. Dev.	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile
<i>STBK</i>	0.35	0.34	0.03	0.25	0.61
<i>LTBK</i>	0.24	0.31	0.00	0.02	0.45
<i>Bank Debt</i>	0.58	0.39	0.15	0.70	0.96

**Table X**  
**Two-Step Robust GMM Results for Creditors' Identity.**

This table includes GMM estimations for Model 6 with alternative dependent variables. In Model 17 the dependent variable is *LGDEBT* (ratio of debt repayable after one year to total debt); in Model 18 the dependent variable is *MAT* (proportion of total debt repayable within one), and it is augmented by *Bank Debt* (ratio of total bank debt to total debt). All remaining variables are defined in Table VI. GMM is the model in the first differences with levels dated [t-2] of the dependent variable, *Leverage*, *Bank Debt*, and *Size* and [t-1, t-2] of all other regressors as instruments. Time dummies are included. Asymptotic standard errors robust to heteroskedasticity are used in the estimations. Sargan test is a test of overidentifying restrictions, distributed as chi-square under the null of instrument validity; m1 and m2 test for first and second order autocorrelation in residuals; Tp is inflexion point for the U-shaped relation of *Executive Ownership*. P-values are reported in parentheses. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% level, respectively.

Dependent variable	LGDEBT		MAT	
	Predicted signs	(17) Coeff.	Predicted signs	(18) Coeff.
<i>LGDEBT<sub>t-1</sub></i>	+	0.427*** (0.000)	+	
<i>MAT<sub>t-1</sub></i>	+		+	0.421*** (0.000)
<i>Largest Non-Managerial Ownership</i>	+	0.003* (0.063)	-	-0.002* (0.062)
<i>Executive Ownership</i>	+	0.009*** (0.004)	-	-0.007** (0.026)
<i>Executive Ownership</i> <sup>2</sup>	-	-0.000*** (0.006)	+	0.000** (0.042)
<i>Split</i>		0.089** (0.034)		-0.085** (0.035)
<i>Ratio</i>	+	0.044 (0.552)	-	-0.048 (0.508)
<i>Market-to-Book</i>	-/+	0.041** (0.031)	+/-	-0.029* (0.100)
<i>Size</i>	+	0.167*** (0.001)	-	-0.140*** (0.005)
<i>Asset Maturity</i>	+	0.00004 (0.984)	-	0.001 (0.761)
<i>Leverage</i>	+	0.341** (0.029)	-	-0.440*** (0.003)
<i>Rating</i>	-	0.072 (0.571)		0.076 (0.516)
<i>Volatility</i>	+	0.198** (0.040)	-	-0.181* (0.051)
<i>Quality</i>	-	0.003 (0.315)	+	-0.002 (0.396)
<i>Tax</i>	-	0.001*** (0.002)	+	-0.001*** (0.003)
<i>Term Structure</i>	+		-	0.003 (0.746)
<i>Bank Debt</i>			+	0.136*** (0.000)
<b>No. of firms</b>		656		656
<b>No. of obs</b>		5983		5983
<b>Sargan test</b>		181.80 (0.366)		203.24 (0.293)
<b>m1</b>		-11.09*** (0.000)		-11.16*** (0.000)
<b>m2</b>		1.02 (0.309)		0.87 (0.385)
<b>Tp</b>		38.1		36.2