

# Managerial Incentives and Corporate Leverage: Evidence from United Kingdom

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## Abstract

This paper investigates the impact of managerial incentives and corporate governance on a firm's capital structure decision. The analysis revolves around the view that managerial incentives, proxied by executive ownership, are important in shaping up a firm's capital structure. However, we argue that the exact impact of these incentives on leverage is likely to be determined by firm-specific governance characteristics. To conduct our investigation, we construct a corporate governance measure using detailed ownership and governance information. We present evidence of a significant non-monotonic relation between executive ownership and leverage. There is also strong evidence suggesting that better corporate governance practices lead to a higher leverage ratio. More importantly, the results reveal that the way in which executive ownership exerts influence on leverage depends on corporate governance mechanisms.

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## 1. Introduction

The relationship between corporate governance and leverage has been extensively investigated in the literature and the importance of the link has been confirmed by many studies (see, e.g., Harris and Raviv, 1988; Stulz, 1990; Zwiebel, 1996; and Shleifer and Vishny, 1997). The findings of prior research suggest that there are two important, and to some extent related aspects of the interaction between governance and leverage. First, corporate leverage can act as a self-disciplining internal governance mechanism to mitigate the costs of the manager-shareholder agency conflict (Grossman and Hart, 1982; and Jensen, 1976 and 1986). In this context, the use of leverage constrains costly managerial actions and hence increases firm value.

The second important aspect of the governance-leverage relationship relates to the role of corporate governance in determining a firm's cost of debt financing and hence its choice of capital structure. It is argued that better governance is associated with lower costs of debt financing and hence higher leverage in firms' capital structure (see, e.g., Cremers *et al.*, 2004; and Klock *et al.*, 2005). According to this view, though leverage does not necessarily play a significant governance role, strong corporate governance, other things being equal, leads to a greater optimal leverage.<sup>1</sup>

These two attributes of the governance-leverage relationship lead to a number of interesting predictions and raise further research questions. For example, other things being

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<sup>1</sup> The term *corporate governance* involves a set of relationships between a company's management, its board, its shareholders and other stakeholders (OECD, 2004). In the context of this paper, corporate governance is seen as a set of mechanisms concerned with providing proper incentives for the management to pursue a capital structure policy that is in the interests of the company and its shareholders. That is, we are mainly concerned with those mechanisms that attempt to resolve the manager-shareholder conflict, while paying less attention on other agency relationships such as between shareholders and debt-holders. Also, throughout the paper, we use terms "good", "strong", "effective", and "better" corporate governance interchangeably to refer to the ability of internal corporate governance mechanisms firms in place to mitigate the agency costs of the manager-shareholder conflicts.

equal, firms with entrenched managers are expected to have low leverage. Moreover, in the absence of strong corporate governance managers can voluntarily raise more debt in an attempt to reduce the costs of the manager-shareholder agency conflict and hence to increase firm value. However, it is also expected that the agency benefits of leverage decrease when governance quality is good. It is then unlikely that firms with strong corporate governance will use leverage for governance purposes.

The objective of this paper is to shed further insights into these predictions by investigating the interactions between corporate governance, managerial incentives and leverage. To do so, we focus on the role of corporate governance in determining a firm's choice of leverage. Specifically, we consider both direct and indirect effects of governance on leverage. We argue that, in addition to its direct influence on leverage through the resulted cost of debt, corporate governance also affect leverage through its impact on the incentives of managers towards debt. Prior empirical research on the governance-leverage relationship has focused mainly on the role of managerial incentives and several corporate governance characteristics in determining firms' financial policy (see Berger *et al.*, 1997; Brailsford *et al.*, 2002 and Kayhan, 2005 among others). However, there is very little empirical research as to how the impact of managerial incentives on the capital structure decision of firms varies with corporate governance. The interactions between managerial incentives and corporate governance in determining leverage are important to analyse. In this paper, we acknowledge that managerial incentives to expropriate wealth from shareholders (e.g. by choosing a leverage ratio that serves their needs but does not maximize firm value) are weaker in firms with strong corporate governance characteristics. Consequently, we investigate carefully the

extent to which the exact nature of the relationship between managerial incentives and leverage is determined by the corporate governance mechanisms firms have in place.

The empirical analysis of this paper is conducted in two stages. In the first stage, we investigate the direct effects of corporate governance and managerial incentives on leverage separately. We hypothesize that in the presence of information asymmetry and costly agency problems, better corporate governance practices facilitate the access of firms to external finance by reducing its cost, leading to a positive relationship between our proxy for corporate governance and leverage.

On the other hand, in line with the alignment and entrenchment effects of managerial ownership on firm value, we expect a non-monotonic relation between executive ownership and leverage. In our empirical analysis, we incorporate executive ownership to proxy for managerial incentives. We argue that the relationship between executive ownership and leverage is positive at lower levels of ownership. This is because greater executive ownership leads to a better alignment of the interests of managers and outside investors, leading to a higher level of debt due to lower cost of debt financing (alignment effect). However, high levels of executive ownership strengthen managerial discretion, possibly leading to managerial entrenchment, which in turn reinforces managerial incentives to choose a lower leverage ratio than optimal. This is based on the view that, *ceteris paribus*, managers try to avoid high leverage in an attempt to minimize the discipline provided by debt and to reduce the probability of bankruptcy (entrenchment effect).

In the second stage of our empirical investigation, we test the extent to which corporate governance and managerial incentives interact in influencing a firm's financing policy. As mentioned earlier, in this study we posit that corporate governance, in addition to its direct

impact on leverage, may also influence managerial incentives towards leverage. It is likely that the entrenchment effect of executive ownership on leverage is less pronounced in firms with effective internal corporate governance mechanisms as the ability of managers to exert opportunistic behaviour is limited in such firms. In the presence of strong corporate governance managers may have the incentives but not the ability to adopt a suboptimal capital structure policy. Similarly, corporate governance may also affect the alignment effect of executive ownership on leverage because corporate governance characteristics such as non-executive directors and ownership concentration may work as substitute governance mechanisms. Put differently, the value of leverage as a self-disciplining governance mechanism diminishes in the presence of strong corporate governance.

In examining the effects of corporate governance and managerial incentives on leverage, we use a large sample of non-financial UK listed firms over the period 1999-2004. First, we employ principal component analysis to create a corporate governance measure for each firm, which represents a score based on the existence of perceived good governance attributes, such as ownership concentration, the ratio of non-executive directors on corporate boards and board size. We then interact this measure with managerial incentives, proxied by executive ownership. Moreover, we utilize alternative econometric techniques to estimate our empirical specification, namely pooled ordinary least squares (OLS), fixed effects regression, and the generalized method of moments (GMM). Our estimation approach enables us to control for endogeneity and unobserved firm heterogeneity. Additionally, it allows us to examine the dynamic nature of the capital structure decision of UK firms.

This paper is similar in spirit to Friend and Lang (1988), Brailsford *et al.* (2002) and Pindado and De La Torre (2005), who analyze how the impact of managerial ownership on

leverage changes with ownership concentration. Friend and Lang (1988) show that the existence of large non-managerial investors in US corporations prevents managers from choosing leverage levels that serve their own interests. Brailsford *et al.* (2002) and Pindado and De La Torre (2005) also report significant interaction effects between managerial ownership and ownership concentration for a sample of Australian and Spanish firms respectively. In contrast to earlier studies that focus solely on ownership concentration, however, we consider a wider set of governance variables, namely ownership concentration, board size and board composition. We focus on corporate governance characteristics, which are also likely to influence the relationship between executive ownership and leverage, and aggregate individual governance mechanisms into a single factor. Our methodology helps avoid problems that may arise from the potential interdependence between corporate governance and control variables (see, for example, Agrawal and Knoeber, 1996).

We believe that our study provides important insights into at least two important related research questions that have not been addressed before. First, if there is a non-linear relation between executive ownership and leverage, does the nature of this relation depend on the corporate governance environment in which firms operate? Second, if there are devices that may act as substitutes to leverage in monitoring and disciplining managers, should one still expect a significant relation between executive ownership and leverage?<sup>2</sup>

The UK market bears several characteristics which, we believe, may have significant implications with regard to the capital structure decision of firms. For example, the existing UK takeover code and the strong minority protection laws make the accumulation of

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<sup>2</sup> The hypothesis that corporate governance mechanisms work as substitutes in mitigating agency problems has recently received attention by researchers (see Weir *et al.*, 2002 and Cremers and Nair, 2005 among others). The main emphasis in these studies, however, is not on how managerial incentives interact with corporate governance but on how internal governance (e.g. monitoring by institutional investors) interacts with external governance (e.g. monitoring by the market of corporate control) in determining firm value.

controlling blocks expensive. The most significant holders in the UK are financial institutions but there is a great deal of evidence that they do not take a very active role in corporate governance.<sup>3</sup> It is also argued that large blocks of shares in the hands of directors, who also control a significant amount of shares, are used to entrench rather than to discipline management. Furthermore, UK boards of directors are generally seen as providing a weak monitoring function mainly due to weak powers that enforce fiduciary responsibilities on directors. All these arguments lead to the hypothesis that managers in the UK enjoy freedom to pursue their own interests that may include deviating from optimal leverage ratio.<sup>4</sup>

The analysis of this paper reveals several important findings. First, the relationship between leverage and executive ownership is non-monotonic. We observe a positive relation at moderate levels of executive ownership but the relationship becomes negative at higher levels. Second, the results suggest that firms with better corporate governance practices have a greater ability to issue debt financing. More importantly, there is strong evidence that the significant relationship between leverage and managerial incentives holds mainly for firms with weak corporate governance. Finally, consistent with the results reported in recent capital structure studies, our dynamic panel data regressions show that UK firms adjust partially towards a target leverage ratio.

The remainder of the paper is organized as follows. In Section 2 we formulate our empirical hypotheses whereas in Section 3 we provide a brief description of the data. Section 4 explains how we construct the governance measure and, also, presents our empirical findings. Finally, Section 5 concludes.

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<sup>3</sup> There are several recent studies, however, which suggest that the involvement of institutional investors in corporate governance is broadening over time (see, for example, Mallin, 1999). Other studies suggest that the monitoring efficiency of financial institutions varies with their type (see, e.g. Khan, 2006).

<sup>4</sup> For a detailed discussion about the characteristics of the prevailing UK corporate governance system see Short and Keasey (1999); Franks *et al.* (2001); Holland (2001); Jones and Pollitt (2004) and Ozkan and Ozkan (2004).

## **2. Managerial incentives, corporate governance and leverage**

In this section, we develop the hypotheses we test in this paper by discussing how executive ownership, corporate governance and their interactions influence the capital structure decision of firms.

### **Managerial incentives and leverage**

The link between leverage decisions of firms and managerial incentives is often not very clear. The basic intuition in the leverage literature is that managers normally have incentives to keep borrowing at lower levels than what an optimal leverage policy would imply. Managers normally prefer low leverage because it reduces the probability of bankruptcy and enables managers to have greater discretion over the use of excess cash, possibly for their own benefit. Furthermore, by having low leverage, firms and their managers are less subject to monitoring by the capital markets (see, e.g., Stulz, 1990; and Hart and Moore, 1995).

In the presence of asymmetric information and costly agency conflicts between managers and outside investors, however, leverage may have a disciplining role to play. Consistent with this view, it is shown that debt, in particular bank debt, is value enhancing in terms of monitoring efficiency, access to private information, efficiency of liquidation in cases of financial distress and efficient renegotiation of debt contracts (see, e.g., Berlin and Lloyes, 1988; Chemmanur and Fulgieri, 1985; and Diamond, 1991). There is also a large body of literature that argues that managerial ownership can help align the interests of managers with those of shareholders. Specifically, it is argued that, with increased managerial ownership, managers are less likely to engage in value decreasing activities as



they bear part of the costs of their actions. To the extent that this is the case and leverage has a value enhancing governance role to play, one would expect that managers increase leverage in a firm's capital structure as their ownership in the firm increases, yielding a positive prediction between managerial ownership and leverage (i.e. the incentive alignment effect). Put differently, managers may voluntarily choose higher leverage as a self-disciplining device because the resulting leverage can increase firm value as the capital markets perceive leverage as a monitoring and disciplining mechanism to control the manager-shareholder agency conflict.<sup>5</sup>

However, it is possible that the relationship between leverage and managerial ownership is non-monotonic. As noted above, managers normally have strong incentives to keep borrowing at a level which is lower than optimal. Furthermore, it is more likely that managers will achieve the objective of low leverage at high levels of managerial ownership when they have much greater discretion and are possibly entrenched. Clearly, this would happen as long as the benefits to managers from low leverage are higher than the shared benefits due to the reduction in the expected agency costs of the manager-shareholder conflict. The above discussion implies a negative relationship between leverage and managerial ownership at higher levels of managerial ownership (i.e. the entrenchment effect). We expect that one would at least observe a decrease in the positive impact of managerial ownership on leverage at higher levels of managerial ownership.<sup>6</sup>

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<sup>5</sup> In addition to the expected agency benefits of leverage, in increasing leverage, managers may also consider the benefits due to the reduction in the likelihood of takeover attempts.

<sup>6</sup> Prior empirical research on the relationship between managerial ownership and leverage provides mixed findings. A number of studies document a positive relationship (Kim and Sorensen, 1986; and Mehran, 1992). A competing argument in the literature is that debt decreases as the level of managerial ownership increases, reflecting the greater non-diversifiable risk of debt to management than to public investors (Friend and Lang, 1988). There is also some evidence for a non-linear relation between managerial ownership and leverage (see, e.g., Brailsford *et al.* 2002).

### **Corporate governance and leverage**

The corporate governance environment in which firms operate has a significant impact on the distribution of leverage across firms. The existence of effective corporate governance attributes, such as large shareholders and effective board of directors, signal the firm's governance quality to its prospective lenders. Consequently, firms with strong corporate governance should have a better reputation, easier access to capital markets and, in general, suffer from lower agency costs of debt, leading to a higher level of leverage in their capital structure. Put differently, better governance is associated with lower costs of debt financing and hence higher leverage. We hence expect a positive relationship between the quality of corporate governance and leverage.

### **Interaction between corporate governance and managerial incentives**

The proposed explanation for the expected relation between corporate governance and leverage mentioned above refers to the direct impact of governance on leverage through the reduced cost of debt financing. This view does not consider, however, the interaction between corporate governance and managerial incentives in influencing leverage. We argue that allowing governance and managerial incentives in the agency framework may lead to different predictions with respect to the impact of managerial incentives on leverage. We do not expect, for example, the non-linear relation between leverage and managerial ownership to hold for firms with effective corporate governance mechanisms in place. This is because in firms with strong governance there would be alternative governance devices acting as substitutes to leverage. In other words, since the potential agency costs of the manager-shareholder conflict are lower in firms with strong corporate governance, there would be less

need for leverage to play the role of disciplining and monitoring. This weakens the link between managerial ownership and leverage. Additionally, the ability of managers to use their discretion would also be reduced in the presence of effective internal corporate governance mechanisms.

We argue that the hypothesized non-linear relation between executive ownership and leverage is more likely to hold for firms with weak corporate governance. To test these hypotheses, we include our corporate governance measure, which is derived using principal component analysis, as well as interaction terms between this measure and executive ownership and its square in the leverage equation. As explained later, we also run regressions for two sub-samples by splitting firms on the basis of our governance measure.

### **Control variables and leverage**

We also use the following firm characteristics as control variables in the empirical analysis. *Tangibility*: Tangible assets work as collateral in diminishing monitoring costs and, also, have a greater value than intangible assets in the case of bankruptcy. Therefore, firms who have greater proportion of tangible assets tend to have higher leverage ratios. We control for this effect by including the ratio of fixed assets to total assets in our empirical models.

*Growth Opportunities*: Myers (1977) argues that high growth firms prefer relatively lower levels of debt in order to avoid the adverse effects of the underinvestment problem. It is argued that such firms should use equity, instead, to finance growth because such financing reduces agency costs between managers and shareholders. We measure growth opportunities as the ratio of the book value of total assets minus the book value of equity plus the market value of equity to the book value of total assets.

*Size:* Larger firms are more diversified (Titman and Wessels, 1988), have easier access to capital markets and borrow at better conditions (Ferri and Jones, 1979) and suffer from lower agency costs related to asset substitution and underinvestment (Ang *et al.*, 1982; and Chung, 1993). Consequently, such firms are expected to raise relatively higher leverage. We use the natural logarithm of total assets as a proxy for size in our analysis.

*Profitability:* On the one hand, the pecking order theory of capital structure posits that firms prefer retained earnings as their main source of financing investment where their second preference is debt and last come new equity issues (Myers and Majluf, 1984). According to this theory, profitable firms mainly rely on their retained earnings to finance investment. Therefore, a negative relationship between profitability and leverage is expected. On the other hand, the trade-off theory predicts that more profitable firms prefer debt to benefit from the tax shield, leading to a positive relationship between debt and profitability. We use the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to the book value of total assets to measure profitability.

### **3. Data**

The data used in this study are obtained from two different sources. We use Datastream to collect accounting data and data on the market value of equity for the years 1999 to 2004. In particular, we collect information on the firms' book and market leverage, asset tangibility, growth opportunities and profitability. Information on the firms' ownership structure and board structure is derived from the Hemscott Guru Academic Database. Specifically, we use this database to get detailed information on the level of executive ownership, ownership concentration and size and composition of the board for each firm.

We compile the final sample in the following manner. We merge data provided from Datastream and Hemscoff and exclude financial firms and utilities from the sample. Then, we drop missing firm-year observations and outliers (i.e. those observations that lie below the 1<sup>st</sup> percentile and above the 99<sup>th</sup> percentile for each variable). These criteria led to a final sample of 956 firms for our empirical analysis. Table 1 provides the definitions of the variables used in the paper whereas Table 2 summarizes the key descriptive statistics. We observe that the average book leverage for UK companies is 16.79 per cent. The average proportion of fixed assets in the balance sheet is 26.65 per cent, market to book ratio is 2.122, size (logarithm of total assets) is 10.89 and profitability is 2 per cent. As far as the ownership structure and board structure variables are concerned, executive directors hold a significant fraction of firms' total shares, 11.60 per cent, whereas the average ownership concentration is 35.61 per cent. Also, the average proportion of non-executive directors is 49.52 per cent and the average board size is 6.767 directors. In general, the descriptive statistics presented in Table 1 are in line with those reported in other studies that use UK firms in their analyses (see, e.g., Rajan and Zingales, 1995; Short and Keasey, 1999; and Ozkan and Ozkan, 2004).

[Insert Tables 1 and 2 here]

Table 3 presents the Pearson's correlation for the variables used in the analysis. As expected, leverage is positively and significantly correlated with size and tangibility but negatively and significantly correlated with the market-to-book ratio. The observed positive correlation between leverage and profitability is against the pecking order theory but in line with the prediction of the trade-off theory. We also observe that firms with high leverage in

their capital structure are more likely to have low levels of executive ownership, a larger board size and a larger proportion of non-executive directors on the board.

[Insert Table 3 here]

## **4. Methodology and results**

In this section we describe how we construct the corporate governance measure using principal component analysis. Then, we present the results of the univariate and the regression analysis.

### **4.1 Construction of the governance measure**

In our analysis, we use principal component analysis (PCA) to aggregate individual governance characteristics into a single governance index.<sup>7</sup> PCA enables us to combine several governance variables in constructing the governance measure but use a single variable in the empirical models. This helps control for potential multicollinearity problems that may arise when one includes more than one governance variable in a cross-sectional regression independently (Agrawal and Knoeber, 1996). An additional advantage of using PCA is that it automatically produces weights so that the governance measure will explain as much of the variance in the group of corporate governance attributes and, therefore, does not require the ex ante determination of the weights. Most of the earlier studies that attempt to establish corporate governance ranking variables count on the strong assumption that all the

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<sup>7</sup> A similar approach has been used in Callahan *et al.* (2003) to derive an index for management involvement in the director nomination process and in Kayhan (2005) to derive a composite proxy for managerial entrenchment.

corporate governance attributes contribute equally to the corporate governance index (see, e.g., Gompers *et al.*, 2003 and Cremers and Nair, 2005).

The governance measure we use in this paper is based on two important guidelines, provided by Combined Code of Corporate Governance (2003), on the composition of the board of directors and the role of large outside shareholders. In particular, it was argued that the board of directors should include a balance of executive and non-executive directors such that no individual or a small group of individuals can dominate the board's decision taking. It was also argued that large shareholders should have a responsibility to make considered use of their votes. Accordingly, we use two aspects of corporate board structure, namely board size (BOARDSIZE) and board composition (NON-EXEC), and one aspect of corporate ownership structure, namely ownership concentration (CONCENTR), to construct our corporate governance measure, GOVERNANCE.<sup>8</sup>

We expect that ownership concentration has a positive weight in the measure. This is based on the conjecture that shareholders with substantial equity stakes have more incentives than small shareholders to supervise management and can do so more effectively (Shleifer and Vishny, 1986; Friend and Lang, 1988; and Shleifer and Vishny, 1997). On the other hand, we expect board size to contribute negatively to the corporate governance measure. It is argued that larger boards are relatively less effective because coordination, communication and decision making is more cumbersome (Yermack, 1996). As for the role of non-executive directors, there is no clear-cut prediction. It is widely acknowledged that non-executive

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<sup>8</sup> One caveat here is that there are several other corporate governance attributes that may intensify the manager-shareholder conflict. These include, for example, CEO tenure, takeover readiness provisions such as poison pills and golden parachutes; and constitutional provisions to prevent majority shareholders from having their way such as staggered boards and limits to shareholder bylaw amendments (see, e.g., Bebchuk and Cohen, 2005; Gompers *et al.*, 2003 and Kayhan, 2005 for a detailed discussion). However, we could not find reliably detailed data on these attributes for each firm during the sample period and hence do not incorporate them in the analysis. We leave this issue for future research.

directors can contribute to better governance by limiting the exercise of managerial discretion within the firm (Byrd and Hickman, 1992). However, it is also argued that non-executive directors do not add much to the governance of firms possibly because they lack information about the firm, do not bring the requisite skills to the job and, hence, prefer to play a less confrontational role rather than a more critical monitoring role. An argument that has gained support recently and was advocated first by Franks *et al.* (2001) is that the inability of the UK regulatory system to enforce the duties of directors causes non-executive directors to be passive, leading to higher managerial entrenchment (see Dahya and Travlos, 2000; Weir *et al.*, 2002 and Ozkan and Ozkan, 2004 for evidence on the role of non-executive directors in UK companies).<sup>9</sup>

Table 4 presents the results from the principal component analysis. In Panel A we report the eigenvalues of the reduced correlation matrix of these variables. According to the obtained eigenvalues, we pick the first factor, hereafter called “GOVERNANCE”, which accounts for the highest percentage of variation. This factor is a linear combination of the variables CONCENTR, NON-EXEC and BOARDSIZE. The underlying eigenvectors, as reported in Panel B, show that ownership concentration contributes positively to the governance measure while board size and non-executive directors contribute negatively to the measure. The positive loading of CONCENTR and the negative loading of BOARDSIZE

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<sup>9</sup> For robustness purposes, we run the principal component analysis after replacing our proxy for ownership concentration with the number of blockholders in each company. The inclusion of this variable in the governance index is based on the view that within the group of major shareholders, controlling blockholders, who can be defined as those who have the capacity to determine the outcome of particular corporate policy decisions, are the ones with the strongest incentives to be active owners. Although the results are similar in both cases (e.g. the variable for controlling shareholders has a positive weight to the governance index) we prefer not to read too much into the new definition given the lack of a commonly accepted definition for controlling shareholders. We note that the majority of studies in previous research classify controlling blockholders as those investors whose ownership stake exceeds the 20 per cent level (see Faccio and Lang, 2002). However, as discussed by Leech (2001), although in most companies a 20per cent threshold is likely to have voting control, in other companies the figure is greater and in some less.



is in line with Shleifer and Vishny (1986, 1997) and Yermack (1996) respectively. The negative sign of NON-EXEC is against the proposition in Byrd and Hickman (1992) but in line with Franks *et al.* (2001). In Panel C, we report descriptive statistics for the variable GOVERNANCE.

[Insert Table 4 here]

#### **4.2 Univariate analysis**

Table 5 presents univariate mean and standard deviation comparisons of several firm specific characteristics by leverage quartiles. We are interested in whether the characteristics of companies differ across low-levered firms (first quartile) and high-levered firms (fourth quartile). In general, the results support the view that firms in the first quartile differ significantly from firms in the fourth quartile. Specifically, we find that firms with low leverage ratios are usually small firms, with a low proportion of tangible assets and relatively greater growth opportunities. We also observe that low-levered firms usually have smaller boards and lower proportions of non-executive directors. However, the level of ownership concentration does not seem to differ significantly across the first and the fourth leverage quartiles (the mean difference is statistically insignificant). Finally, the findings in Table 5 show that low-levered firms indicate relatively higher levels of executive ownership. This is consistent with the managerial entrenchment hypothesis in that managers become entrenched after a specific level of executive ownership, leading to a negative relationship between executive ownership and leverage.

[Insert Table 5 here]

However, one needs to be cautious in interpreting the latter finding as anecdotal evidence for a negative relationship between executive ownership and leverage. Firstly, univariate analysis does not effectively control for a potential non-linearity in that relationship. Secondly, as mentioned earlier, it is likely that the relationship between executive ownership and leverage also depends on the corporate governance environment in which firms operate. To address these issues, we provide a detailed preliminary investigation on the relationship between executive ownership, corporate governance and leverage. Specifically, we split the sample into two groups by labeling the upper 45 per cent in terms of GOVERNANCE as “high-governance firms” and the lower 45 per cent as “low-governance firms”. Then, in Table 6 we examine how changes in executive ownership influence leverage for the two sub-samples.

The results from this investigation point to a non-linear relationship between executive ownership and leverage (for both definitions of leverage). Although strong inferences cannot be drawn from this exercise, there is some evidence suggesting that, if any, the non-linear relationship between executive ownership and leverage is more pronounced for low-governance firms. That is, the results possibly suggest that there is an interaction effect between executive ownership and corporate governance. In particular, when executive ownership is between 10 per cent and 20 per cent the average book leverage ratio (market leverage ratio) is 14.22 per cent (8.15 per cent) for low governance firms. As we move to the next sub-group, the average value of book leverage (market leverage) increases to 19.75 per cent (10.43 per cent). After that point it seems that the relationship between executive ownership and leverage becomes negative. For example, the average book leverage ratio (market leverage ratio) drops to 10.08 per cent (4.90 per cent) when executive ownership lies

between 40 per cent and 50 per cent and to the level of 8.37 per cent (3.19 per cent) when executive ownership is greater than 50 per cent.

[Insert Table 6 here]

### **4.3 Regression analysis**

Table 7 presents the regression results where book leverage is regressed on a set of firm characteristics, including corporate governance, executive ownership and their interactions. We start by estimating a baseline model that includes the firm characteristics suggested by Rajan and Zingales (1995). This model is estimated using a pooled OLS estimator (Model 1), a fixed effects estimator (Model 2) and an OLS lagged estimator where leverage is measured at time  $t$  whereas the independent variables are measured at  $t-1$  (Model 3). The results indicate that the estimated coefficients of asset tangibility and firm size are positive and statistically significant in all models. That is, on average, larger firms, and those firms with a greater proportion of tangible assets prefer higher leverage ratios. These results are in line with the findings of prior empirical research on leverage (see Rajan and Zingales, 1995; Booth *et al*, 2001 and Gaud *et al*, 2005 among others). Also, as expected, the estimated coefficient of the market-to-book ratio, MKTBOOK, is negative and statistically significant at the 1 per cent level in Models 1 and 3, which supports the view of Myers (1977) that high-growth firms prefer lower leverage to avoid potential agency problems related to underinvestment. This evidence is also in line with empirical studies by Rajan and Zingales (1995), Ozkan (2001) and Gaud *et al*. (2005). However, we do not observe a significant relationship between market to book ratio and leverage under the fixed effects estimation, which is consistent with the findings of Bevan and Danbolt (2004). Finally, there is some

evidence (only in Model 1 though) that profitability enters negatively the leverage equation, which is in line with the pecking order explanation of capital structure.

[Insert Table 7 here]

In Models 4 to 6, we extend our baseline model by including executive ownership, the square of executive ownership, and the corporate governance measure in the model. The level and the squared terms of executive ownership are included together to test the hypothesis that there is a non-linear relation between leverage and executive ownership. The inclusion of the governance measure in the model helps test the direct effect of internal corporate governance on leverage. Finally, the interaction terms are used to test the hypothesis that corporate governance influences the capital structure decision indirectly, through changing the incentives of managers towards debt.

In line with our expectations, the results reveal that the relationship between executive ownership and leverage is non-monotonic. In particular, when the level of executive ownership is low, an increase in executive ownership has the effect of aligning managers and shareholders' interests, leading to a relatively higher leverage ratio. However, when the level of executive ownership is high, the entrenchment effect sets in, resulting in a lower debt level. Our findings suggest a turning point of about 29 percent. That is, the leverage ratio of firms increases as executive ownership increases up to 29 per cent, and then decreases for ownership levels above 29 per cent. We also observe a positive and significant association between our measure of corporate governance measure (GOVERNANCE) and leverage. This finding supports the view that well-governed firms, other things being equal, face a lower

cost of external finance and hence are able to increase their debt ratios (i.e. direct effect of corporate governance on leverage).

Furthermore, the results reveal that the estimated coefficients of both interaction terms are statistically significant. The negative coefficient of the interaction term between GOVERNANCE and EXECOWNER indicates that, ceteris paribus, the alignment effect of executive ownership is less pronounced in well-governed firms. This lends support to the proposition that the role of leverage as a disciplining and a monitoring device is minimized in well-governed firms as the expected costs of agency conflicts are significantly lower. In other words, executive ownership plays a less important role as an incentive mechanism in firms with strong monitoring mechanisms. We also observe a positive and statistically significant coefficient of the interaction term between corporate governance and the square of executive ownership. Such evidence can be taken as support for the view that the entrenchment effect of executive ownership on leverage becomes weaker as the effectiveness of corporate governance increases. This is possibly because managers in well-governed firms are less able to expropriate wealth by pursuing a lower level of leverage than what shareholders desire. We test the joint significance of both interaction terms included in specifications 4 to 6 by utilizing a Wald test. The results reject the null hypothesis that both interaction terms equal zero, supporting the specification of these models. We obtain similar results after using a market definition of leverage (results are available upon request).<sup>10</sup>

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<sup>10</sup> The OLS results presented in Table 7 are obtained after using robust to heteroscedasticity standard errors. Another problem that may bias our results is time series dependence because the residuals of a given firm may be correlated across years (unobserved firm effect) (see, e.g., Petersen, 2005). To control for this problem we cluster our observations into industries and re-estimate our models. That is, we assume that observations may be correlated within clusters, but would be independent between clusters. In this way, the bias caused by unobserved firm effects is eliminated. We repeat our task after clustering with respect to different firm-sizes (e.g. very small, small, large, very large companies classified according to the value of their total assets and their market value). In both cases the results are not materially different from those reported in Table 7. This suggests that the results that were obtained using the OLS approach are not subject to time series dependence.

In Table 8, we provide further tests for the existence of an interaction between executive ownership and corporate governance. To do so, we split the sample into “low-governance” firms and “high-governance” firms and examine whether the earlier observed non-linear relationship between executive ownership and leverage holds for both subsamples. We perform this exercise both for book leverage (Panel A) and market leverage (Panel B). The models are estimated using the OLS lagged approach. The results confirm the existence of a non-linear impact of executive ownership for the sample of low-governance firms. The estimated coefficients of EXECOWNER and EXECOWNER\_SQ are statistically significant at the 1 per cent level. However, in support of our earlier findings and argument, we do not observe a significant impact exerted by executive ownership on leverage. These findings provide further support for the existence of an interaction between corporate governance and executive ownership in influencing leverage.

[Insert Table 8 here]

#### **4.4 Capital structure dynamics and robustness**

So far, our empirical specification has been static. In this section, we present the results from the dynamic panel data estimations. In the context of our analysis, a dynamic panel data framework is useful for two reasons. First, it helps control for the endogeneity problem that may arise due to unobserved heterogeneity (e.g. unobservable firm characteristics may be highly correlated with regressors). To this end, the dynamic model complements the OLS lagged approach that only controls for endogeneity due to reverse causality. Second, it enables to examine the dynamic nature of the capital structure decisions of firms. A dynamic specification recognizes that firms may have a target leverage ratio that can not be achieved

instantaneously. Instead, due to adjustment and other costs firms adjust partially to the desired leverage level (see Ozkan, 2001 and Miguel and Pindado, 2001 for a useful discussion on these issues). The empirical specification we adopt is given by

$$Y_{it} = (1-b)Y_{it-1} + \sum_{k=1}^k \delta_k X_{ik} + n_i + n_t + u_{it} , \quad (1)$$

where  $Y$  represents our proxy for corporate leverage and  $X_k$  is a vector of variables that account for firm-specific characteristics, including executive ownership, corporate governance as well as the interactions between executive ownership (and its square) and corporate governance. The terms  $n_i$  and  $n_t$  represent time-invariant firm-specific and firm-invariant time-specific effects respectively.

Equation (1) contains a lagged dependent variable,  $Y_{it-1}$ , recognizing that firms can not adjust instantaneously to the desired level of leverage following changes in firm-specific characteristics or random economic shocks. Our dynamic specification assumes that the adjustment depends on the parameter  $b$ , called the speed of adjustment, which gives the fraction of the desired change that managers can achieve. That is,  $Y_{it} - Y_{it-1} = b(Y_{it}^* - Y_{it-1})$ , where  $Y_{it}$  is the actual leverage ratio at time  $t$ , while  $Y_{it}^* - Y_{it-1}$  can be interpreted as the desired change in leverage. By definition, the value of  $b$  varies between 0 (no adjustment at all towards the target) and 1 (immediate adjustment to the target).

For the estimation of equation (1) we use the GMM estimator proposed by Arellano and Bond (1991) given that ordinary least squares (OLS) and fixed effects are likely to yield inconsistent estimates when used to estimate dynamic models (see Bond, 2002 for a detailed discussion). The GMM estimator involves the use of instruments dated  $[t-2]$  or earlier for the lagged dependent variable and the endogenous regressors as well as a first difference transformation. These two characteristics control for the possibility that the results are driven

by reverse causality or unobserved heterogeneity problems. The consistency of the GMM estimator, however, depends on the validity of instruments used, which the absence of higher order serial correlation in the idiosyncratic component of the error term is crucial for. To this end, we report the Sargan test of over-identifying restrictions, under the null that instruments are valid, and two further tests for existence of first and second order serial correlation in the first differenced residual (denoted as  $m1$  and  $m2$  respectively).

Table 9 presents the results from the dynamic leverage model. In all specifications we use instruments dated  $[t-2]$ . The Sargan test confirms the validity of instruments whereas the  $m1$  and  $m2$  tests confirm the existence of serial correlation of order one but not of order two. Consistent with the dynamic capital structure hypothesis, the results indicate that firms partially adjust towards an optimal leverage ratio, with the coefficient of adjustment being close to 0.6. The dynamic panel data regressions also show that size and growth opportunities remain as two of the most important determinants of leverage. Their coefficients are positive and statistically significant in both dynamic models.

[Insert Table 9 here]

As far as the impact of managerial incentives and internal corporate governance on firm's financing policy are concerned, our results confirm our earlier findings that both variables are statistically significant in the leverage equation. Specifically, there is supporting evidence for both the alignment and entrenchment effects of executive ownership and the corporate governance measure, GOVERNANCE, enters the equation with a positive sign (see Model 12). In addition, the GMM estimations indicate that corporate governance also



affects the leverage decision indirectly. Specifically, it seems that the alignment effect of executive ownership is less pronounced in firms that operate under a strong corporate governance environment (i.e. the governance measure is relatively high). However, in contrast to the results obtained using the static specification, the dynamic analysis does not show that the entrenchment effect of executive ownership also varies with corporate governance (the coefficient of the interaction term between the square of executive ownership and corporate governance is statistically insignificant in Model 12). These results hold under both definitions of leverage.

In summary, the results from the dynamic panel data regressions support our earlier findings that corporate governance and managerial incentives are both important in shaping the capital structure decision of firms. It also seems that the impact of managerial incentives on leverage, in particular the alignment effect of executive ownership, varies with the effectiveness of the corporate governance environment in which firms operate. Finally, consistent with recent studies on the subject our GMM results confirm the dynamic nature of the capital structure decision of firms.

## **5. Conclusion**

In this paper, using a large sample of 956 UK listed firms during the period 1999 to 2004, we have provided an empirical analysis of the relation between leverage, corporate governance and managerial incentives. We employ principal component analysis to construct a corporate governance measure, which represents a score based on the existence of perceived good governance attributes, such as ownership concentration, non-executive directors and board size. The econometric specification used in this study allows the test of the hypothesis that

internal governance influences leverage both directly, through reducing the expected agency costs of debt, and indirectly, through influencing managerial incentives to towards leverage. It also allows to us investigate the hypothesis that firms, due to adjustment and other costs, adjust only partially towards an optimal leverage ratio.

Our empirical findings strongly suggest that the quality of internal corporate governance structure matters to the leverage decision. In particular, it seems that firms with strong corporate governance are able to raise more external debt due to a reduction in the expected agency costs of the manager-shareholder conflict. Also, managerial incentives play a significant role in determining leverage. We provide strong evidence that the relation between leverage and executive ownership, used as a proxy for managerial incentives, is non-monotonic. Most importantly, we present evidence in support of the view that internal corporate governance and managerial incentives interact in determining leverage. Specifically, it seems that although managerial incentives play a significant role – though changing at different levels of executive ownership – the exact nature of these effects depends on the corporate governance mechanisms firms in place. In firms with weak corporate governance, both the alignment and the entrenchment effects of executive ownership are observed strongly. However, in firms with strong governance, executive ownership does not influence the capital structure decision of firms significantly. Finally, these findings also imply that the role of leverage in reducing the costs of the manager-shareholder agency conflicts may be significant only in firms with weak governance mechanisms where there are no effective governance substitutes to leverage.

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**Table 1: Variables, Definitions and Sources**

Variable	Definition	Source
<b>Dependent Variables</b>		
LEVERAGE(BOOK)	The ratio of the book value of total debt to the book value of total assets (%)	Datastream
LEVERAGE (MKT)	The book value of total debt to the sum of the book value of total assets and the market value of total equity (%)	Datastream
<b>Independent Variables</b>		
TANGIBILITY	The ratio of total fixed assets to the book value of total assets (%)	Datastream
MKTBOOK	The ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets.	Datastream
SIZE	Total assets (in logarithm)	Datastream
PROFITABILITY	The ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to the book value of total assets	Datastream
EXECOWNER	The percentage of equity ownership held by executive directors (%)	Hemscott
CONCENTR.	The sum of the stakes of firm's shareholders (other than managers) with equity ownership greater than 3 per cent (%)	Hemscott
NON-EXEC.	The ratio of the number of non-executive directors to the number of total directors on the board (%)	Hemscott
BOARD SIZE	The total number of directors on the board	Hemscott

*Notes:* This Table provides the definitions of the main variables used in our analysis as well as some information on our data sources. Datastream database provides accounting and market data. Hemscott Guru Academic database provides financial data for the UK's top 300,000 companies and detailed data on all directors of UK listed companies.

**Table 2: Descriptive Statistics (N=956)**

	Mean	St.Dev	Min	25%	Median	75%	Max
LEVERAGE (BOOK)	16.79	15.29	0	3.68	13.72	26.31	77.84
LEVERAGE (MKT)	9.73	10.02	0	1.50	7.05	14.70	61.10
TANGIBILITY	26.65	24.75	0	6.93	18.22	40.17	98.64
MKTBOOK	2.122	1.777	0.168	1.122	1.551	2.490	19.58
SIZE	10.89	2.238	6.218	9.202	10.65	12.26	18.87
PROFITABILITY	0.02	0.21	-1	-0.036	0.081	0.144	0.432
EXECOWNER	11.60	16.03	0	0.358	4.042	17.80	89.55
CONCENTR	35.61	26.62	0	21.69	35.68	49.71	92.88
NON-EXEC	49.52	13.81	0	40.00	50.00	58.74	100
BOARDSIZE	6.767	2.186	3	5.166	6.333	8	15

*Notes:* This Table provides descriptive statistics for the main variables used in our analysis. The means of the variables are measured over the period 1999–2004. Definitions for all the variables are provided in Table 1.

**Table 3: Correlation Matrix (N=956)**

	1	2	3	4	5	6	7	8	9
1. LEVERAGE	1.000								
2. TANGIBILITY	0.421***	1.000							
3. MKTBOOK	-0.227***	-0.268***	1.000						
4. SIZE	0.415***	0.331***	-0.292***	1.000					
5. PROFITABILITY	0.217***	0.308***	-0.195***	0.3466***	1.000				
6. EXECOWNER	-0.138***	-0.116***	0.130***	-0.396***	-0.040	1.000			
7. CONCENTR	-0.041	0.038	-0.034	-0.113***	-0.019	-0.260***	1.000		
8. NON-EXEC	0.133***	0.089***	0.006	0.312***	0.020	-0.391***	0.119***	1.000	
9. BOARDSIZE	0.241***	0.185***	-0.080	0.727***	0.241***	-0.280***	-0.131***	0.189***	1.000

Notes: This Table presents the Pearson's Correlation matrix for the main variables used in our analysis. Definitions for all the variables are provided in Table 1. \* indicates that correlation is significant at the 1% level.



**Table 4: Results from Common Factor Analysis**

<i>Panel A : Eigenvalues of the reduced correlation matrix</i>			
1	2	3	
1.167	1.099	0.744	
<i>Panel B: Index Weight</i>			
	CONCENTR	NON-EXEC	BOARDSIZE
	0.336	-0.524	-0.782
<i>Panel C: Descriptive statistics for the first factor extracted (called GOVERNANCE)</i>			
Mean	Min	Median	Max
1.09e-17	-4.828	0.102	3.601

Notes: This Table provides the results from the common factor analysis used to derive our corporate governance proxy. The variables CONCENTR, NON-EXEC and BOARDSIZE are used as corporate governance attributes. Analytical definitions for these variables are provided in Table 1.

**Table 5: Firm Characteristics by Leverage Quartiles**

Variable	Q1	Q2	Q3	Q4	t-test
TANGIBILITY	13.32 <i>13.25</i> [17.41]	21.52 <i>20.89</i> [20.05]	28.79 <i>27.63</i> [21.77]	42.97 <i>44.79</i> [28.31]	-13.79*** -15.05***
MKTBOOK	2.948 <i>3.161</i> [2.633]	2.076 <i>2.336</i> [1.475]	1.827 <i>1.624</i> [1.386]	1.637 <i>1.365</i> [0.798]	7.37*** 10.18***
SIZE	9.507 <i>9.432</i> [1.561]	10.49 <i>10.59</i> [1.913]	11.40 <i>11.44</i> [2.151]	12.17 <i>12.19</i> [2.320]	-14.74*** -15.64***
PROFITABILITY	-0.061 <i>-0.071</i> [0.247]	0.009 <i>0.014</i> [0.217]	0.054 <i>0.068</i> [0.187]	0.078 <i>0.068</i> [0.154]	-7.39*** -7.23***
EXECOWNER	15.04 <i>14.98</i> [16.91]	12.85 <i>13.27</i> [16.99]	10.14 <i>10.74</i> [14.61]	8.37 <i>7.41</i> [14.33]	4.59*** 5.22***
CONCENTR	38.36 <i>38.36</i> [18.99]	36.68 <i>35.18</i> [19.89]	34.98 <i>36.03</i> [17.77]	35.61 <i>36.04</i> [18.71]	1.59 1.38
NON-EXEC	47.92 <i>47.79</i> [15.25]	47.73 <i>48.16</i> [13.14]	50.43 <i>50.00</i> [13.22]	52.02 <i>52.15</i> [13.14]	-3.15*** -3.44***
BOARDSIZE	6.101 <i>6.067</i> [1.730]	6.332 <i>6.430</i> [1.832]	7.056 <i>7.150</i> [2.387]	7.576 <i>7.420</i> [2.400]	-7.70*** -7.17***
GOVERNANCE	0.373 <i>0.389</i> [0.830]	0.275 <i>0.203</i> [0.866]	-0.091 <i>-0.090</i> [1.066]	-0.331 <i>-0.257</i> [1.121]	7.59*** 7.27***

Notes: This Table provides univariate mean comparisons of several firm specific characteristics by book leverage quartiles (normal format) and market leverage quartiles (italic format). It also provides standard deviation comparisons by book leverage quartiles (bracketed). The *t*-statistic is for a difference of means from the first to the fourth quartiles. Definitions for all the variables are provided in Table 1. \*\*\* indicates that the difference in means is statistically significant at the 1% level.

**Table 6: Leverage by Executive Ownership and Corporate Governance Effectiveness**

	<u>Book Leverage</u>		<u>Market Leverage</u>	
	<i>High-Governance</i>	<i>Low-Governance</i>	<i>High-Governance</i>	<i>Low-Governance</i>
	<i>Firms</i>	<i>Firms</i>	<i>Firms</i>	<i>Firms</i>
1. EXECOWNER <10 %	14.75	21.17	9.11	12.39
2. 10%< EXECOWNER<20%	10.02	14.22	5.38	8.15
3. 20%< EXECOWNER<30%	14.95	19.75	8.15	10.43
4. 30%< EXECOWNER<40%	11.73	19.43	6.34	9.63
5. 40%< EXECOWNER<50%	18.78	10.08	9.98	4.90
6. EXECOWNER>50%	12.28	8.37	6.49	3.19

*Notes:* This Table examines how leverage varies with changes in executive ownership and corporate governance. We split the sample into two groups by labeling the upper 45 per cent in terms of GOVERNANCE as “High-Governance Firms” and the lower 45 per cent as “Low-Governance Firms”. Analytical definitions for the variables EXECOWNER and GOVERNANCE are defined in Table 1. The number of high-governance firms in groups 1, 2, 3, 4, 5 and 6 is 202, 91, 58, 26, 22 and 31 respectively. The number of low-governance firms in groups 1, 2, 3, 4, 5 and 6 is 346, 30, 19, 18, 7 and 10 respectively.

**Table 7: Regressions Predicting Leverage**  
 Dependent Variable: *Models 1-6: LEVERAGE (BOOK)*

<i>Independent Variables</i>	<u>Estimation Method</u>					
	<i>OLS</i>	<i>FIXED EFFECTS</i>	<i>OLS-LAGGED</i>	<i>OLS</i>	<i>FIXED EFFECTS</i>	<i>OLS-LAGGED</i>
	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>	<u>Model 5</u>	<u>Model 6</u>
Constant	-0.092 (2.98)***	-	-0.076 (2.29)**	-0.158 (-4.28)***	-	-0.157 (3.82)***
TANGIBILITY	0.198 (9.40)***	0.294 (6.74*)**	0.178 (7.92)***	0.198 (9.54)***	0.295 (6.74)***	0.178 (8.12)***
MKTBOOK	-0.003 (-2.84)***	0.001 (1.23)	-0.005 (-3.56)***	-0.002 (-2.05)**	0.001 (1.24)	-0.004 (2.79)***
SIZE	0.022 (10.4)***	0.038 (5.89)***	0.022 (9.35)***	0.028 (10.3)***	0.039 (5.89)***	0.028 (9.37)***
PROFITABILITY	-0.046 (3.26)***	-0.093 (-7.72)***	-0.021 (-1.43)	0.021 (0.55)	-0.093 (7.68)***	-0.031 (-2.03)**
EXECOWNER	-	-	-	0.134 (2.14)**	0.041 (0.63)	0.171 (2.59)***
EXECOWNER_SQ	-	-	-	-0.248 (-2.57)***	-0.057 (-0.56)	-0.296 (-2.86)***
GOVERNANCE	-	-	-	0.016 (3.09)***	0.008 (1.98)*	0.016 (2.84)***
GOVERNANCE * EXECOWNER	-	-	-	-0.153 (-2.50)**	-0.101 (-2.15)**	-0.144 (-2.01)**
GOVERNANCE * EXECOWNER_SQ	-	-	-	0.276 (2.81)***	0.166 (1.84)*	0.248 (2.14)**
Industry Dummies	<b>Yes</b>	-	<b>Yes</b>	<b>Yes</b>	-	<b>Yes</b>
Time Dummies	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
R <sup>2</sup>	27.19	11.45	26.78	29.76	11.67	27.71
Number of firms	956	883	875	956	883	875
Number of observations	4293	4220	3297	4293	4220	3297

*Notes:* This Table provides the results from several regressions predicting leverage. We use a pooled OLS approach to estimate models 1 and 4, a fixed effects approach to estimate models 2 and 5 and an OLS lagged approach to estimate models 3 and 6. The dependent variable in all models is the book value of total debt to the book value of total assets. The independent variables, except for GOVERNANCE, are defined in Table 1. GOVERNANCE is an index variable that evaluates the effectiveness of the corporate governance environment in which firms operate and is derived after using Principal Component Analysis (see Section 4.1 for details). t-statistic values are reported in parentheses. \*\*\*, \*\* and \* indicate coefficient is significant at the 1%, 5% and 10% levels respectively

**Table 8: Regressions Predicting Leverage**Dependent Variable: *Panel A: LEVERAGE (BOOK), Panel B: LEVERAGE (MKT)*

	<b>Panel A</b>		<b>Panel B</b>	
	Low Governance firms (Model 7)	High Governance firms (Model 8)	Low Governance firms (Model 9)	High Governance firms (Model 10)
Constant	-0.159 (-2.98)***	-0.040 (-0.68)	-0.094 (-2.49)**	-0.063 (-1.50)
TANGIBILITY	0.169 (5.18)***	0.224 (7.22)***	0.122 (5.28)***	0.159 (6.74)***
MKTBOOK	-0.005 (-2.33)**	-0.005 (-3.28)***	-0.009 (-5.40)***	-0.006 (-5.52)***
SIZE	0.027 (7.67)***	0.015 (3.14)***	0.017 (6.90)***	0.012 (3.25)***
PROFITABILITY	-0.028 (-1.12)	-0.025 (-1.34)	-0.049 (-2.71)***	-0.027 (-2.04)**
EXECOWNER	0.331 (3.28)***	0.050 (0.59)	0.198 (3.32)***	0.010 (0.16)
EXECOWNER_SQ	-0.506 (-3.12)***	-0.115 (-0.87)	-0.322 (-3.43)***	-0.059 (-0.65)
Time Dummies	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Industry Dummies	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
R <sup>2</sup>	0.303	0.253	0.329	0.266
Number of firms	403	388	403	388
Number of observations	1586	1382	1586	1382

*Notes:* This Table provides the results from OLS lagged regressions predicting leverage. We split the sample into two groups by labeling the upper 45 per cent in terms of GOVERNANCE as “High-Governance Firms” and the lower 45 per cent as “Low-Governance Firms” In Panel A the dependent variable is the book value of total debt to the book value of total assets. In panel B the dependent variable is the book value of total debt to the sum of the book value of total assets and the market value of total equity. The independent variables are defined in Table 1. All regressions include industry dummies. t-statistic values are reported in parentheses. \*\*\* and \*\* indicate coefficient is significant at the 1% and 5% levels respectively.

**Table 8: Dynamic Panel Data Results (GMM)**  
 Dependent Variable: *Models 6-10: LEVERAGE (BOOK)*

<i>Independent Variables</i>	Model (11)		Model (12)	
Constant	-0.002	(-0.37)	0.003	(0.59)
LEVERAGE <sub>t-1</sub>	0.423	(5.86)***	0.351	(4.90)***
TANGIBILITY	0.256	(1.17)	0.170	(0.75)
MKTBOOK	-0.010	(-1.91)*	-0.009	(-2.14)**
SIZE	0.109	(2.87)***	0.065	(1.74)*
PROFITABILITY	0.115	(1.75)*	0.046	(0.88)
EXECOWNER	-		0.495	(2.04)**
EXECOWNER_SQ	-		-0.692	(-2.16)**
GOVERNANCE	-		0.043	(2.36)**
GOVERNANCE * EXECOWNER	-		-0.316	(1.96)**
GOVERNANCE * EXECOWNER_SQ	-		0.419	(1.13)
Observations	2125		2125	
Wald (joint)	46.40	0.00	51.98	0.00
Sargan	21.40	0.13	36.72	0.19
m1 test	-5.197	0.00	-5.110	0.00
m2 test	0.092	0.93	-0.105	0.92

*Notes:* This Table reports the results from the GMM (in first differences) estimator. The dependent variable is the book value of total debt to the book value of total assets. The independent variables, except for GOVERNANCE, are defined in Table 1. GOVERNANCE is an index variable that evaluates the effectiveness of the corporate governance environment in which firms operate and is derived after using Principal Component Analysis (see Section 4.1 for details). For the estimation, levels dated [t-2] were used as instruments. Time dummies were used in all specifications. For the estimation we used asymptotic standard errors robust to heteroscedasticity. We report a Wald test which evaluates the joint significance of all regressors in each model. We also report the Sargan test, which is a test of over-identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null of valid instruments. m1 and m2 are tests for the absence of first order and second order correlation in the residuals. These test statistics are asymptotically distributed as N (0,1) under the null of no serial correlation. \*\*\*, \*\* and \* indicate coefficient is significant at the 1%, 5% and 10% levels respectively.