

Company Ownership and Capital Structure

Jie (Michael) Guo, Li Ding and Ji Sun*

June 5, 2010

Abstract

This paper examines the effect of ownership structure on firms' leverage level, using a sample of 365 UK firms from 1997 to 2009. The study also investigates the influence of ownership on firms' external finance decisions, and further analyzes this impact under different stock market conditions, by observing 273 debt and 289 equity offerings during the same period. As the empirical results show, in the sample of all companies the effect of ownership concentration on market leverage is negative, which is consistent with the argument that large shareholders are more averse to increasing the debt level, because of the risk of bankruptcy and financial distress. However, in firms with low ownership concentration the effect is positive. We also find that the change in firms' leverage around the security issuance is positively associated with the level of ownership concentration, indicating that firms with highly concentrated ownership are more likely to choose more debt and less equity issuance than are firms with dispersed ownership. Moreover, the impact of ownership concentration on firms' external finance decisions varies under different stock market conditions. The impact is insignificant when the stock market is cold, but exists under median and hot stock market conditions.

Keywords: Ownership, Capital Structure, Stock Market Conditions, Security Issues, Agency Theory

Author for correspondence, Ji Sun; contact address: Durham Business School, Durham University, Mill Hill Lane, Durham, DH1 3LB, UK. Email: ji.sun@durham.ac.uk

1. Introduction

While a large number of prior studies have demonstrated that ownership structure is an important instrument to improve firm performance (Jensen and Meckling, 1976; Shleifer and Vishny, 1986; Morck, Shleifer and Vishny, 1988; Demsetz and Lehn, 1985; McConnell and Servaes, 1995), the relations between ownership structure and capital structure remain largely unexplored. The extant literature is scarce but mixed. Grossman and Hart (1986) and Anderson et al. (2003) confirm that firms with a high ownership concentration structure have higher leverage level than firms with dispersed ownership, but Nam et al. (2003) find the opposite outcome. In addition, Brailsford et al. (2002) suggest that the impact of ownership on leverage is nonlinear, varying across the level of managerial share ownership. Moreover, ownership structure as a crucial determinant in corporate governance is closely associated with cost of debt and equity financing. Lundstrum (2009) finds a negative relationship between managerial share ownership and the magnitude of leverage change before issuance. Therefore, there seem to exist links between ownership structure and firms' external financing decisions. With regard to market timing theory, firms' choice of debt or equity is also highly associated with current stock market conditions. If the stock market is hot, firms will consider equity issue as a first choice; if not, they might favour debt financing. However, no previous study has linked the impact of ownership concentration on external financing policy with market timing theory, to check whether this impact changes with different stock market conditions.

In this study, we attempt to interpret whether ownership concentration affects firms' external financing decisions, and thus capital structure, in the context of large shareholders' behaviour and agency theory. Shleifer and Vishny (1986, 1997) find that according to the efficient monitoring hypothesis, large external shareholders have strong incentives to monitor and discipline management in order to mitigate agency cost. Grossman and Hart (1986) further indicate that shareholders with large stakes can gain internal benefit from their monitoring. Moreover, large shareholders are usually risk averse, so that they may avoid undertaking

investment with high risk premia, resulting in the under-investment problem (Demsetz and Lehn, 1985).

In contrast, diversified shareholders are more interested in undertaking risky projects with high expected return at the expense of bondholders' wealth (Jensen and Meckling, 1976). This is because diversified shareholders can obtain the excess returns if the investment is successful, while creditors bear the cost of failure. As a result, creditors demand higher debt cost. Furthermore, dispersed ownership may weaken the monitoring mechanism, due to the free rider problem (Grossman et al., 1980).

In addition, the divergence between voting right and cash flow right means that controlling shareholders tend to consume the corporate resources, while the minority shareholders cannot share the advantages (Morck, Shleifer and Vishny, 1988; Holderness, 2003). Furthermore, larger shareholders potentially expropriate minority investors in the firms with high concentrated ownership (La Porta et al., 1999; Denis and McConnell, 2003). Johnson et al. (2000) put forward the term "tunnelling" to describe how controlling shareholders extract private benefit from firms' assets and resources.

Based on the argument above, we begin by examining whether ownership concentration might affect firms' leverage level, and then test the effect of ownership on firms' external financing decisions. Most prior evidence shows that firms with high ownership concentration have higher leverage levels (Grossman and Hart, 1986; Anderson et al., 2003). Controlling shareholders prefer debt to equity financing, since they tend to maintain their level of voting control for a given level of equity. Moreover, a higher level of debt can reduce the risk of the firm becoming a takeover target. However, shareholders in firms with dispersed ownership are willing to diversify their risk to invest in different firms and in risky projects, so that they may expropriate the creditors' interest (Jensen and Meckling, 1976). As a result, debt holders will demand higher interest on debt to compensate their potential loss, and thus the cost of debt financing increases.

With regard to the negative impact of ownership concentration on firms' leverage, the explanation is built on the theory that the controlling shareholders wish to reduce the control risk exposure; hence they are more averse to the risk of financial distress and bankruptcy that follows high debt level (Mishra and McConaughy, 1999). However, some scholars argue that ownership structure is an exogenous variable, which does not influence firm performance and leverage (Chaganti and Damanpour, 1991; Anderson and Reeb, 2003).

In order to explore these issues fully, the following two hypotheses are developed and tested in this study:

Hypothesis 1: Ownership concentration does have an influence on firms' leverage level.

Hypothesis 2: Ownership concentration has a positive impact on the leverage change around the security issue.

The other important objective of this paper is to test the impact of ownership on leverage change around a security issue under a range of stock market conditions: hot, median and cold. According to market timing theory, the current market conditions play an important role in capital structure decisions. Firms are likely to issue shares when their stock price is high, and repurchase shares or choose debt issuing when their stock price is low. Graham and Harvey (2001) found that two-thirds of CEOs admit that market timing is an important consideration for capital structure. Later, Baker and Wurgler (2002) proposed that firms tend to raise external funds when their cost of equity is temporarily low, and that past market timing decisions have long-lasting impact on leverage. Moreover, Welch (2004) concludes that fluctuations of firms' own stock price is a primary determinant of debt-equity ratio and that the effect is permanent. Moreover, Pedersen and Thomsen (2000) consider the condition of the stock market as a determinant likely to affect firms' ownership. When the stock market is hot, firms' stock prices are overvalued so that managers prefer to issue equity and sell shares, resulting in dispersed ownership (Pedersen and Thomsen, 2000). In contrast, if firms' stock prices are undervalued, managers will tend to repurchase shares to raise the stock price, causing ownership to become more concentrated.

Therefore, the third hypothesis extends Hypothesis 2 and links it with market timing theory:

Hypothesis 3: The impact of ownership on firms' choice of debt or equity will vary according to different stock market conditions.

The present study measures ownership concentration according to the percentage of shares owned by block holders; this data is hand collected from Thomson ONE Banker. In the first stage, we test whether ownership concentration affects firms' leverage, using the sample of 365 UK firms during the calendar years 1997-2009. Financial and utilities firms are excluded from the research sample. Subsequently, we observe the relation between ownership concentration and firms' external financing behaviour, using 273 debt and 289 equity offerings. Then we apply three proxies - cumulative stock market return, P/E ratio and equity issue volume - to divide stock market conditions into hot, cold and median periods. Thus this study examines how the impact of ownership concentration on the magnitude of leverage change around security offering varies across distinct stock market conditions. In addition to the three motivations, our empirical tests also examine the other determinants of ownership structure: firm size, market-to-book ratio, tangibility, sales growth, capital expenditure, dividend, tax rate, non-debt tax shield and credit rating.

The results of this study show that ownership concentration does have significant impact on firms' leverage level, and this impact varies according to different samples selected. In the sample of all companies, the results present the negative effect of ownership on book leverage, supporting the theory that controlling shareholders are more averse to increase the debt level because of the risk of bankruptcy and financial distress. In contrast, the opposite effect is found in the firms whose ownership concentration is in the range of 0%-25%. In the firms with wide ownership, the large external shareholders desire to restrict managers' entrenchment by debt financing. We further find that the firms' leverage change around security issuance has positive impact on the level of ownership concentration. In other words, firms with high concentrated ownership are more likely to choose more debt and less equity issuance than are firms with low ownership concentration, which is consistent with

Lundstrum's (2009) analysis. As we posited, the impact of ownership concentration on firms' external financial decision varies across different stock market conditions. The impact is insignificant in cold stock market conditions, but significant during median and hot stock market periods. Moreover, the results are robust to test other effects of firms' characteristics on capital structure. Firms' profitability, sales growth and tangibility and dividend are negatively related to leverage level. However, the influences of firm size, market-to-book ratio and non-debt tax shield on leverage are positive and significant.

This paper contributes to addressing three important gaps in the prior literature. First, although ownership structure has been widely accepted as an important tool to mitigate agency cost and improve firm performance, very few studies have analyzed the impact of ownership on capital structure, especially in the UK market. Prior literature reveals that UK firms are more likely to possess high leverage ratio, as a result of the junk bond problem. Although UK firms tend to be in dispersed ownership, investors nevertheless hold relatively large equity stakes (Mayer, 2000). Furthermore, most large shareholders are financial institutions, but they do not take a very active role in monitoring management. Franks et al. (2001) propose that most parties in UK firms, including block holders and boards of directors, exert a weak monitoring function. These arguments suggest that managers in UK firms may be more entrenched to pursue their own interest, regardless of whether the firms carry optimal leverage ratio. Therefore, this paper analyzes the relation between ownership concentration and capital structure with reference to specific features of UK firms.

Second, few papers have shed light on the extended impact of ownership concentration on firms' external financing policy. According to the pecking order theory, adverse selection leads managers to consider internal funds as a first choice, followed by debt issue, and with equity issue as a last resort. Large shareholders favour debt rather than equity issue, in order to maintain their voting and control power and to monitor the corporate governance in the concentrated ownership firm. In addition, debt financing effectively limits managers' behaviour, such as the private benefits of control, because block holders have greater incentives to monitor management than do dispersed shareholders. Furthermore, debt financing is an

efficient mechanism to assist creditors to discipline the controlling shareholder and to impose constraints via covenant (Shleifer and Vishny, 1986, 1997). In general, family owned firms prefer debt issue, due to their long-term commitment to the business; thus they usually bear a lower cost of debt financing (Anderson et al., 2003). Nevertheless, in the firms with low ownership concentration, managers are likely to issue equity, in accordance with pecking order theory. On the one hand, managers desire to avoid the pressure of paying interest on debt. On the other hand, they are unwilling to be monitored by outside investors and creditors. Moreover, managers may issue less debt in order to shield firms from the risk of bankruptcy and financial distress, since they want to protect their own positions.

Third, to date no paper has investigated whether the relation between ownership concentration and leverage change around security issuance changes under different stock market conditions. In practice, managers investigate the current market conditions before they make capital structure decisions, which is the core of market timing theory. When the stock market condition is hot, investors are over-optimistic and consequently, stock prices are overvalued. This increased market value can directly generate lower leverage level for firms. Moreover, managers may perceive the hot stock market condition as a good opportunity to raise capital by issuing equity, further reducing the firm's debt ratio. If the stock market is not bullish, managers will defer equity issuance. From another point of view, seasoned equity offering (SEO) can be considered as a "right offer" to existing shareholders. In that situation, the equity offering may reduce the level of ownership concentration in that shares are sold to institutions and other outside investors. The asymmetric information related to firms' fundamental value existing between managers and external shareholders will affect the willingness of shareholders to participate in an equity offering (Eckbo and Masulis, 1992). In a hot stock market, clustered equity issue is likely to result in decreased ownership concentration. Thus it seems that stock market conditions affect not only firms' debt-equity choice, but also the level of ownership concentration, which is good reason to believe that stock market conditions might influence the impact of ownership on firms' external financing decisions.

The rest of the paper is organized as follows. Section 2 describes the sample selection,

definition of variables and model design. Section 3 presents the empirical results and discussion. Conclusions are presented in Section 4.

2. Sample Selection, Definition of Variables and Model Design

This section describes the sample selection and the data sources. All the variables used in the empirical work have been defined and analyzed in previous literature, particularly in discussion of the measures and proxies of capital structure, ownership concentration and market conditions. The section concludes by presenting two leverage equations.

2.1 Sample selection

In order to examine the impact of ownership concentration on firms' leverage, the sample consists of all of the UK firms listed on the London Stock Exchange. Due to the limited ownership information provided by Thomson ONE Banker, the research period is restricted to 13 years, from 01/01/1997 to 31/12/2009. Financials (SIC code 6000-6999) and utilities (SIC code 4900-4949) are eliminated from the sample. This is because the leverage ratio in financials is significantly different from that in non-financials, and the utility industry takes a regulatory role, with limited scope for corporate control activity (Leonard, 2008). Thus, the sample is reduced from 606 to 365 companies.

The second motivation of this paper is to investigate how ownership concentration affects leverage change during different stock market conditions. Therefore, we should observe all UK firms' bond and equity issuance shown on Thomson ONE Banker during the 13-year period. We focus on relatively large offers, whose value exceeds USD 100 million. After excluding financials and utilities, the sample size is reduced to 1372 debt offers and 5038 equity offers. In addition, the IPO-related equity issuance is removed from the database, because this paper lays emphasis on listed firms. We match the ownership and accounting data with the offering activity, and thus the final sample is shrunk into 273 debt and 289 equity issues.

There are two sources to obtain the data. We download the accounting and market data for the sample period 1997-2009 from Thomson DataStream. The information of ownership and issuance is derived from Thomson ONE Banker. It is worth mentioning that the data about ownership is hand collected, since it can only be downloaded one company at a time, one quarter at a time. For each company, the following terms are included: the equity ownership of the top three largest shareholders and all block holders (>5%), large shareholder type, and global region. We exclude observations where the total percentage of block holders exceeds 100%.

2.2 Variable definitions and predictions

Leverage

Prior literature has developed various indicators of capital structure. Scholars measure debt in a variety of ways, such as book valuation or market valuation of debt, total debt or long-term debt only. Welch (2004) uses interest coverage ratio as the measure of leverage.

Following Fama and French (2000), leverage is defined in two ways: book leverage and market leverage. The detailed definitions are presented in Table 1.

Ownership concentration

Demsetz and Lehn (1985) measured ownership concentration (OC) as the fraction owned by the five, ten or twenty largest shareholders. Subsequently, Earle et al. (2005) explored alternative ownership concentration measures to capture some important aspects of interactions among large shareholders and the pattern of concentration that may influence the effect of ownership on leverage. With this in mind, we employ OC to measure ownership concentration, in which a block holder is defined as owning over 5% of a firm's share

(Worldscope/Disclosure, 1997). Ownership holding has been classified into three ranges: low concentration (0-25%), intermediate concentration (25-50%) and high concentration (>50%).

Large shareholders or block holders have more incentive to monitor corporate governance in order to align the management with their interest, resulting in lower agency conflict between managers and shareholders (Shleifer and Vishny, 1986). The intention of managers is to maintain viability in the firm, thus reducing the level of debt, since increased debt leads to high bankruptcy cost. In short, firms with higher external block-holding are expected to have a relatively lower leverage ratio, because managers' pursue their own interest to reduce the debt level in capital structure.

Investor type is also highly related with leverage ratio. Family controlled firms with high ownership concentration are more likely to have efficient monitoring of management, in order to reduce the agency conflict between owner and manager (Morck et al., 1988; Anderson and Reeb, 2003). However, the conflict of interest between large shareholders and minority shareholders becomes more serious. Moreover, family owned firms value control more highly than do non-family owned firms. Thus they may prefer debt financing rather than equity. Institutional investors have the resources and ability to monitor corporate management. However, they pursue high return and risky projects, causing reduced monitoring efficiency, because of the diversified shareholders who invest in multiple firms (Coffee, 1991; Black, 1992; Tufano, 1996). Therefore, managers are more entrenched in those firms owned by institutional investors. Otherwise, financial institutions as large shareholders make firm finance easier, but investment strategy is limited (Friend and Lang, 1988).

Other variables

In addition to ownership structure, firms' leverage level is affected by other factors, which can be divided into firm-specific characteristics such as profitability, firm size, market-to-book ratio, tangibility, sales growth, capital expenditure, dividend, tax rate, non-debt tax shield and credit rating. The impact of each factor on capital structure decisions is indicated according to

prior theories. Moreover, we use three proxies to identify hot and cold stock market conditions. Table 1 presents descriptions of these factors and the data sources.

Profitability

The effect of profitability on leverage has long been argued (Harris and Raviv, 1991; Rajan and Zingales, 1995; Booth et al., 2001), but results have been inconsistent. More profitable firms not only have lower cost of bankruptcy and financial distress, but also seem to have efficient management. Moreover, in firms with high profitability, the use of debt as a monitoring mechanism is more likely to solve the free cash flow problem (Jensen, 1986). Thus profitable firms use more debt financing.

However, the pecking order theory indicates that firms should choose internal cash flows as the first option for financing, before considering external financing. More profitable firms should retain more of their earnings to invest in new projects, but less profitable firms will resort to debt financing. This negative impact of profitability on debt level may be challenged by the presence of large investment (Booth et al., 2001).

Firm size

In Frank and Goyal's (2007) survey of trade-off and pecking order theory, larger firms have relatively low leverage ratio. Because larger firms are more diversified and have better management, they face lower default risk (Friend and Lang, 1988). In addition, larger firms may have more experience of the market and employ outstanding managers, which will bring about higher firm efficiency. In contrast, small firms actively use equity financing.

Growth opportunities

Firms' growth opportunity can be measured by market-to-book ratio, sales growth and capital expenditure. According to trade-off theory, growth of firm increases the cost of financial

distress, weakens the free cash flow problem and exacerbates agency cost of debt (Frank and Goyal, 2009). Thus the growth opportunities reduce leverage ratio to a certain extent. Furthermore, due to various kinds of disclosure practices and lender-borrower relations, the role of growth may vary across different countries. Antoniou et al. (2008) state that the negative impact of firms' growth in capital market-oriented economies is stronger than that in bank-oriented economies.

The market-to-book ratio is the most widely used indicator to predict firms' growth opportunities, and it can capture the change of leverage brought by equity mispricing. According to the asymmetric information theory, over valuation will make firms issue equity; but when stock price is undervalued, firms purchase shares or issue debt. Therefore, firms with higher market-to-book ratio should lower debt level by equity issuance. However, as described by the pecking order theory, firms consider debt as the first choice of external financing, and only then resort to equity issuance. In this case, the growth opportunities should have a positive impact on leverage.

Sales growth is considered by previous literature as an alternative measure of firms' growth. Low growth firms will have fewer opportunities to substitute low risk for risky and high return investments; hence they should face lower agency costs of debt and may be able to carry more debt in their capital structure. High growth firms on the other hand may face a more intense debt overhang problem, as described by Jensen and Meckling (1976) and Myers (1977). In other words, the effect of sales growth on leverage is positive. This impact is more significant in small, family-owned firms, where there is a fear of losing control to the bank.

Tangibility

The tangibility of the firm's assets is closely associated with agency costs of debt and the costs of financial distress (Myers, 1977; Booth et al., 2001). Firms with more tangible assets have greater ability to secure debt because these assets can be used as collateral (Jensen and Meckling, 1976). Furthermore, in a bankruptcy situation tangible assets have more market

value than do intangible assets; hence the bondholder will demand a lower risk premium. This indicates that asset tangibility has a positive effect on leverage (Titman and Wessels, 1988). Moreover, the use of collateral plays a more important role in countries where creditor protection is relatively weak, such as France (La Porta et al., 1998). Firms with lower fixed assets may have more opportunities to expropriate bondholder interest by substituting safer projects for riskier projects (Booth et al., 2001; Anderson et al., 2003).

Dividend payout ratio

Based on the agency cost and market efficiency theory, dividend payout ratio is considered as a prominent factor to impact adversely on leverage (Rozeff, 1982). However, Chang and Rhee (1990) argue that firms with high dividend payout ratio are more likely to issue more debt than are firms with low payout ratio, because the effective capital gain tax rate is lower than the dividend tax rate.

Taxes

The effect of tax on leverage ratio is measured by two variables: tax rate and non-debt tax shield. The trade-off theory posits that firms will extend the amount of debt to take advantage of greater interest tax shields (Haugen and Senbet, 1987). DeAngelo and Masulis (1980) demonstrate that non-debt tax deduction can be used to describe the tax shield benefits of debt. Depreciation ratio, net operating loss carry forwards and investment tax credit are employed as proxies for non-debt tax shield (Titman and Wessels, 1988).

Credit rating

As argued by pecking order theory, firms which have higher ratings have less adverse selection problems, because credit rating involves a process of information revelation by the rating agency, for example S&P Credit Rating and Moody Rating. Firms with a higher reputation in the debt market may issue more corporate bonds (Denis and Mihov, 2003).

Moreover, Sufi (2007) explores a new measure of information asymmetry though using the credit ratings from Standard & Poor's.

Stock market conditions

Price-earnings ratio (P/E ratio) has long been used to measure stock market conditions. Jeremy Siegel (1998) argues that the earnings yield is a good indicator of the market performance in the long run.

We also employ equity issue volume and cumulative market return as proxies of stock market condition. According to market timing theory, firms rebalance their leverage across different stock market periods. Welch (2004) observes that firms' leverage ratio undergoes obvious change after shock to the stock price. He also claims that stock return can explain 40 percent of the variation in corporate debt ratio change. Moreover, due to the information asymmetry between managers and outside shareholders, manager should time the equity market to sell shares when stock prices are overvalued. Lucas and McDonald (1990) investigated stock price behaviour around equity issues and found that on average, equity issues are preceded by an abnormal rise in the market. Therefore, equity issuance is clustered following the run-up of stock price.

In this study, we calculate the cumulative market return and cumulative equity issue by de-trended monthly moving average market return and the volume of equity respectively. The hot (cold) stock market condition is defined as those ranked in the top (bottom) 30% of all quarters during 1997-2009, referring to p/e ratio, cumulative market returns or cumulative equity issues. Those between 30% and 60% can be defined as median stock market conditions.

(Please insert Table 1 here)

2.3 Model design

This paper uses three models. One is used to test the impact of ownership concentration on leverage. The second is applied to examine how various ownership concentrations affect firms' debt-equity choice and the magnitude of offerings. The third is to test whether the effect of ownership concentration on external financing policy changes with different stock market conditions.

(1) Regressing leverage on ownership concentration

$$\text{Leverage}_t = \alpha_0 + \alpha_1 \text{OC}_t + \alpha_2 \text{Profitability}_t + \alpha_3 \text{firmsize}_t + \alpha_4 \text{Mbratio}_t + \alpha_5 \text{salesgrowth}_t + \alpha_6 \text{tangibility}_t + \alpha_7 \text{dividend}_t + \alpha_8 \text{taxrate}_t + \alpha_9 \text{nondebttaxshield}_t + u_t$$

(2) Regressing leverage change on ownership concentration by debt and equity issues respectively

$$\text{Leverage change} = \alpha_0 + \alpha_1 \text{OC}_t + \alpha_4 \text{Profitability}_t + \alpha_5 \text{firmsize}_t + \alpha_6 \text{Mbratio}_t + \alpha_7 \text{salesgrowth}_t + \alpha_8 \text{tangibility}_t + \alpha_9 \text{dividend}_t + \alpha_{10} \text{taxrate}_t + \alpha_{11} \text{nondebttaxshield}_t + \alpha_{12} \text{creditrating}_t + u_t$$

(3) Testing the impact of ownership of firms' issue activity under different stock market conditions

$$\text{Leverage change} = \alpha_0 + \alpha_1 \text{OC} + \alpha_2 D_1 + \alpha_3 D_2 + \alpha_4 \text{Profitability}_t + \alpha_5 \text{firmsize}_t + \alpha_6 \text{Mbratio}_t + \alpha_7 \text{salesgrowth}_t + \alpha_8 \text{tangibility}_t + \alpha_9 \text{dividend}_t + \alpha_{10} \text{taxrate}_t + \alpha_{11} \text{nondebttaxshield}_t + \alpha_{12} \text{creditrating}_t + u_t$$

In regression 3, the stock market is separated into three conditions - cold, median and hot - by using cumulative market returns, P/E ratio and cumulative equity volumes. As mentioned above, firms' increased (decreased) market value can directly generate lower (higher) leverage ratio. In order to remove this effect, the variables D_1 and D_2 are applied in this

analysis. Thus, cold stock market is set as a dummy variable, equal to 0, when the stock market condition is ranked in the bottom 30%, and 1 otherwise. Hot stock market is also a dummy variable, equal to 1 when the stock market condition is in the top 30% of the whole research period and 0 otherwise. D_1 is defined as OC times cold stock market dummy. D_2 is defined as OC times hot stock market dummy.

Book leverage is defined as book debt over total asset. Market leverage is the ratio of book debt to market value. Book change is the ratio of proceed amount to total asset. Market change is the ratio of proceed amount over market value. OC represents the sum of shares held by block holders. Profitability is earnings before interest, taxes and depreciation (EBITDA) over total debt. Firm size is expressed as the log of total sales. Mb ratio is market value of asset. Sales growth is measured by change in log of total asset. Tangibility is calculated as tangible asset over total asset. Dividend expresses common dividend payout ratio. Tax rate is defined as ratio of taxes paid to pre-tax income. Non debt tax shield denotes non-debt tax shield. Credit rating is a dummy variable that is equal to 1 when firms' S&P bond rating is above A-, and 0 if below A-.

3 Empirical Work

Descriptive statistics

Table 2 presents descriptive statistics of firm characteristics by 365 sample companies from 1997 to 2009. The companies are separated into four groups by ownership concentration: all companies, and high, intermediate and low ownership concentrated firms. In the UK firms, the mean of book and market leverage are 56.92 % and 37.52% respectively. These ratios are quite high compared to other countries, for example the US market from 1965 to 2001 (Flannery and Rangan, 2006), and Brazil and Mexico for the period 1985-1991 (Booth et al., 2001). This might be explained by the junk bond problem, which means that it is easier for UK firms to issue debt without having a high credit rating. However, those high-yield bonds bring

high possibility of default.

The average of ownership concentration (OC) is around 33.50% in the intermediate range, suggesting that large shareholders may take an inactive role in monitoring management and that managers may be more entrenched to pursue their own interest, regardless of whether the firms carry optimal leverage ratio. The majority of UK firms have a low level of OC, and only 20.6% have high OC. Columns 5 to 13 highlight the difference among the firms with various levels of OC. It is worth noting that firms with higher levels of OC have smaller amounts of debt than do those with dispersed ownership. This suggests that controlling shareholders are more averse to increase the debt level because they fear the bankruptcy risk that accompanies high OC. We also find that low OC firms have a dividend payout ratio (11.20%) that is considerably higher than the average level (8.94%).

(Please insert Table 2 here)

In Table 3, panel A shows all security issues in each year from 1997 to 2009, comprising 1216 debt and 3733 equity issuances. As shown in columns 2 and 4, there are only 52 debt issues in 2008, but their proceed amount is the largest during the research period, at USD 331 million. We also notice that the equity issuances are significantly smaller than debt issuances. This evidence demonstrates that firms make financing decisions by adverse selected cost, preferring debt rather than equity issues, consistent with the pecking order theory.

In panel B and panel C, we use the firms' accounting data matched to issues and divide the issues into four groups by OC. As shown in panel B, only 12 debt issues (4.4% of the total debt issue) come from high OC firms. Conversely, the number of debt issues from low OC firms is 210 (76.92% of total debt issues). From this panel, we observe that the firms with higher OC hold greater leverage ratio, implying that the high OC firms prefer to issue debt as their first choice of external financing, because control shareholders fear the dilution of voting right that results from equity issue. However, panel C depicts evidence of the opposite scenario, whereby firms' debt is reduced with increased level of OC, which supports the

conclusions from Table 2.

Comparing the accounting data in panel B and panel C, we find that firms' financing decision may be affected by firm size. Larger firms prefer debt issue but smaller firms are more likely to issue equity. Consistent with Friend and Lang (1988), larger firms have higher credit rating and reputation, so that their cost of debt should be relatively lower than for smaller firms.

(Please insert Table 3 here)

Table 4 reports the cross-sectional regression of leverage on ownership concentration. We use different samples to test the impact of OC and other firm characteristics on leverage level. The results support the proposition that ownership concentration has significant impact on leverage level, but this impact is not monotonic across various levels of ownership concentration.

Column 2 reveals that the effect of OC on book leverage is negative at 1% level. The high OC firms tend to maintain their leverage at a lower level. As argued by Mishra and McConaughy (1999), higher debt level is followed by higher probability of financial distress and bankruptcy, so that the block holders are more likely to maintain a lower debt level to reduce their control risk exposure. Moreover, we find that the relation between ownership concentration and capital structure is absent in the firms with high OC and intermediate OC, but significantly positive in firms with dispersed ownership (low OC). This evidence supports the view that high OC firms should exhibit higher financial leverage, as controlling shareholders maintain their voting control for a given level of equity.

Profitability has a significantly negative coefficient (shown in columns 3, 4, 5, 7, 8 and 9). This is consistent with the pecking order theory. As posited, firm size has significantly positive impact on debt ratio at 1% level in all samples. Market-to-book ratio has positive effect on book leverage, supporting market timing theory that firms tend to issue equity instead of debt when market value is high (Baker and Wurgler, 2002). However, it is negatively associated with market leverage, in accordance with pecking order theory. We also discover that, as

expected, sales growth is positively related to leverage in firms with intermediate OC, but the relation is negative in other samples, due to the high yield bond problem in the UK. Firms maintain a high debt capacity in capital structure, even those with low sales growth.

The coefficients of tangibility and dividend are negative and significant in the sample of all security issues, which is contrary to the predictions mentioned before. A possible explanation is found in pecking order theory, whereby the firm considers debt as the first choice of external financing, before equity issuance. This finding can also be explained by the fact that greater debt leads to higher risk of bankruptcy.

The results demonstrate that tax ratio has positive impact on leverage level in high OC firms, but no impact in the other samples. The coefficient of non-debt tax shield is positive and significant at 1% level, which is consistent with the argument of Moh'd Perry and Rimbey (1998). They consider that depreciation is the primary component of non-debt tax shield, and that higher depreciation charges represent the higher level of tangibility, which implies the firm's own higher collateral value and thus the capacity of the firm rises.

(Please insert Table 4 here)

Table 5 reveals the impact of ownership concentration on leverage and leverage change around a security issue, using debt and equity offering respectively. First, we focus on the effects of ownership concentration and other variables on leverage ratio. The observations of debt issuance (columns 2 and 3) show that ownership concentration and non-debt tax shield have significant positive impact on leverage level, but the impact of profitability is adverse. The results according to market-to-book ratio are mixed. Debt issues contain the data on credit rating, but not the impact on leverage. However, ownership concentration shows a negative impact on leverage in the sample of equity issues. In addition, the positive effect of firm size on leverage is only found in the group of equity offerings.

Second, the evidence shows that the ownership concentration has significant positive impact on leverage change around security issuances (see columns 5, 8 and 9). Because the

change of leverage with debt issue is positive, the magnitude of leverage change in the firms with high OC is more than in the firms with dispersed ownership. However, the leverage change from equity issue is negative, thus the firms with high OC lower their leverage less than do firms with low OC. This indicates that firms with high OC issue larger amounts of debt than do low OC firms, so that the leverage level in the high OC firms will increase more than that in the firms with dispersed ownership. In contrast, the firms with low OC issue greater amounts of equity and the leverage level reduces more than in firms with high OC.

The coefficient of profitability in columns 4 and 5 is positive and significant, consistent with most empirical results. According to pecking order theory, if firms need to finance new investment with external funds, they prefer debt issue rather than equity issue. Firm size also negatively affects the leverage change by debt issue, but positively impacts leverage change by equity issue, indicating that large firms tend to issue smaller amounts of debt and more equity than do small firms. The evidence shown by market-to-book ratio is also consistent with market timing theory, in that firms tend to issue equity when their market value is high. The coefficient of tangibility is positive and significant. This is because firms with more tangibility usually have more assets that can be used as collateral. Tax rate and non-tax debt shield only have a significant effect on leverage change around debt issue. It can be found that firms with higher tax rate tend to issue more debt to take advantage of the deductibility of interest expenses, but non-debt tax shield can be used to substitute for tax shield benefits of debt, so that firms with greater non-debt tax shield should issue less debt to maintain their leverage at a low level, supporting the contention by DeAngelo and Masulis (1980).

(Please insert Table 5 here)

Figures 1, 2 and 3 present the stock market conditions during 1997-2009, measured by cumulative market return, P/E ratio and cumulative equity volume. From Figure 1 we can observe that the stock market is cold during the second quarter of 2002 and third quarter of 2008, whereas in 2009 the stock market is bullish. Figure 2 shows that at the beginning of 2001, P/E ratio is quite high. At the same time, the equity volumes are clustered, which also occurs in the first and third quarters of 2009. From this, we find that stock market conditions

are quite different, depending on the measures. Thus we apply each measure to separate the research period into three stock market conditions: hot, median and cold.

(Please insert Figures 1, 2 and 3 here)

Based on the analysis above, we then verify the proposition that the impact of ownership concentration on leverage changes around security issuance varies according to different stock market conditions. As revealed from columns 2, 3, 4 and 5 of Table 6, the coefficient of OC is insignificant but the coefficient of D1 is statistically significant. The essential implication of these results is that ownership concentration has no impact on leverage change when the stock market is cold; the impact only exists in median and hot stock market conditions. The other two robust tests, in which the stock market is measured by P/E ratio and cumulative equity volume, suggest that the positive relation between ownership concentration and firms' external financing activity is monotonic under various stock market conditions.

(Please insert Table 6 here)

4 Conclusion

In this paper, the relation between firms' ownership concentration and leverage level has been analyzed. Moreover, the impact of ownership concentration on leverage change around bond and equity issues has been tested, and this impact has been further examined in different stock market conditions. The data of ownership concentration for 365 UK firms during the calendar years 1997-2009 was hand-collected. The sample consists of 273 debt and 289 equity issues downloaded from Thomson ONE Banker, with matched accounting data drawn from DataStream. The sample excludes financials and utilities. In addition, IPO related equity issues were removed from the sample, because we focus here on listed firms.

We find that ownership concentration does have significant impact on firms' leverage level. The effect is non-monotonic, changing across the various levels of ownership concentration. In firms with dispersed ownership, the effect is positive, but it is absent in firms whose ownership concentration level exceeds 25%. The findings further confirm the agency conflict between managers and shareholders, implying that debt financing is not only an effective instrument to assist external shareholders and bondholders to monitor corporate management, but also that higher debt capacity protects firms from becoming the target of hostile takeover. Moreover, the results show that the effects of profitability, sales growth and tangibility and dividend are negative and significant. However, the impact of firm size, Mb ratio and non-debt tax shield on leverage are positive and significant.

The evidence demonstrated strongly supports hypothesis 2. The change of debt capacity around security offers has positive impact on ownership concentration. In other words, the magnitude of the decline (rise) in leverage by issue equity (debt), is greater (smaller) in firms with high ownership concentration than in firms with dispersed ownership, which is consistent with Lundstrum (2009). In particular, the relation between ownership concentration and leverage change around security issuance does indeed depend on the circumstances of the stock market. There is evidence that this relation does not exist when the stock market is cold, but only under hot and median stock market conditions.

References

Alti, A., 2006. How persistent is the impact of market timing on capital structure? *Journal of Finance* 61, 1681-1710.

Anderson, R.C. and Reeb, D.M., 2003. Founding family ownership and firm performance: Evidence from the S&P 500. *Journal of Finance* 58 (3), 1301–1328.

Anderson, R.C., Mansi, S.A. and Reeb, D.M., 2003. Founding family ownership and the agency cost of debt. *Journal of Financial Economics* 68, 263–285.

Antoniou, A., Guney, Y. and Paudyal, K. 2008. The determinants of capital structure: Capital market oriented versus bank oriented institutions. *Journal of Financial and Quantitative Analysis* 43, 59-92.

Baker, M. and Wurgler, J. 2002. Market timing and capital structure. *Journal of Finance* 57, 1-32.

Berle, A. and Means, G. 1932. *The Modern Corporation and Private Property*. Macmillan, New York.

Black, B. S., 1990. Shareholder passivity re-examined. *Michigan Law Review* 89 (3), 520-608.

Black, B. S., 1992. Agents watching agents: The promise of institutional investor voice. *UCLA Law Review* 39 (4), 811-892.

Black, B.S. and Coffee, J.C., 1994. Hail Britannia?: Institutional investor voice. *UCLA Law Review* 92 (7), 1997-2087.

Booth, L., Aivazian V., Demirguc-Kunt, A. and Maksimovic, V., 2001. Capital structures in developing countries. *Journal of Finance* 56(1), 87-130.

Bradley, M., Jarrell, G. and E. Han Kim, 1984. On the existence of an optimal capital structure: Theory and evidence. *Journal of Finance* 39, 857-878.

Brailsford, T.J., Oliver, B.R. and Pua, S.L.H., 2002. On the relation between ownership structure and capital structure. *Journal of Accounting and Finance* 42, 1-26.

Chaganti, R. and Damanpour, F., 1991. Institutional Ownership, Capital Structure, and Firm Performance. *Strategic Management Journal* 12, 479-491.

Chang, R.P., Rhee, S.G. and Soedigno, S., 1995. Price volatility of Indonesian stocks. *Pacific-Basin Finance Journal* 3, 337-355.

Claessens, S. and Djankov, S., 1999. Ownership concentration and corporate performance in the Czech Republic. *Journal of Comparative Economics* 27 (3), 498-513.

Coffee, J.C., 1991. Liquidity versus control: The institutional investor as corporate monitor. *Columbia Law Review* 91 (6), 1277-1366.

DeAngelo, H., and Masulis, R., 1980. Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics* 8, 3-29.

Demsetz, H., 1983. The structure of ownership and the theory of the firm. *Journal of Law and Economics*, 26, 375-390.

Demsetz, H. and Lehn, K., 1985. The structure of corporate ownership: Causes and consequences. *Journal of Political Economy* 93 (6) 1155-1177.

Denis, D.K. and McConnell, J.J., 2003. International corporate governance. *Journal of Financial and Quantitative Analysis* 38 (1), 1-36.

Denis, D. J., and Mihov, V., 2003. The choice among bank debt, non-bank private debt, and public debt: Evidence from new corporate borrowings. *Journal of Financial Economics* 70, 3-28.

Earle, J.S., Kucsera, C. & Telegdy, Á., 2005. Ownership concentration and corporate performance on the Budapest stock exchange: Do too many cooks spoil the goulash? *Corporate Governance* 13 (2), 254-264.

Eckbo, B.E. and Masulis, R.W., 1992. Adverse selection and the rights offer paradox. *Journal of Financial Economics* 32, 293-332.

Fama, E.F. and French, K.R., 2002. Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies* 15, 1-33.

Fama, E. and Jensen, M., 1983. Separation of ownership and control. *Journal of Law and Economics* 26 (2), 301–325.

Flannery, M. and Rangan, K. 2006 Partial adjustment toward target capital structures. *Journal of Financial Economics* 79: 469-506.

Frank, M.Z., and Goyal, V.K., 2007. Trade-off and pecking order theories of debt, In B.E. Eckbo (ed.) *Handbook of Corporate Finance: Empirical Corporate Finance*, Vol. 2. Handbook of Finance Series; Elsevier/North-Holland, Amsterdam, Chapter 12.

Frank, M.Z., and Goyal, V.K., 2009. Capital structure decisions: which factors are reliably important? *Financial Management* 38 (1) 1-37.

Franks, J., Mayer, C. and Renneboog, L., 2001. Who disciplines management in poorly performing companies? *Journal of Financial Intermediation* 10, 209-248.

Friend, I. and Lang, L., 1988. An empirical test of the impact of managerial self-interest on corporate capital structure. *Journal of Finance* 43 (2), 271–281.

Gilson, S.C., 1997. Transactions costs and capital structure choice: Evidence from financially distressed firms. *Journal of Finance* 52, 161–19.

Graham, J. and Harvey, C., 2001. The theory and practice of corporate finance: evidence from the field. *Journal of Financial Economics* 60, 187-243.

Grossman, S.J. and Hart, O., 1980. Disclosure Laws and Takeover Bids. *The Journal of Finance* 35, 2, 323-334.

Grossman, S.J. and Hart, O., 1982. Corporate financial structure and managerial incentives. In: McCall, J. (ed.) *The Economics of Information and Uncertainty*. University of Chicago Press, Chicago.

Grossman, S.J., and Hart, O.D., 1986. The costs and benefits of ownership: A theory of vertical and lateral integration. *Journal of Political Economy*, 94, 4, 691-719.

Harris, M. and Raviv, A., 1991. The theory of capital structure. *Journal of Finance* 46,297–355.

Haugen, R. and Senbet, L., 1987. On the resolution of agency problems by complex financial instruments: A reply. *Journal of Finance* 42, 1091-1095.

Holderness, C.G., 2003. A survey of blockholder and corporate control, *Federal Reserve Bank of New York Economic Policy Review* 9, 51-63.

Hovakimian, A., 2006. Are observed capital structures determined by equity market timing? *Journal of Financial and Quantitative Analysis* 41, 221-243.

Hovakimian, A., Opler, T. and Titman, S., 2001, The debt-equity choice. *Journal of Financial and Quantitative Analysis*, 36, 1-24.

Hull, R.M., 1999. Leverage ratios, industry norms, and stock price reaction: An empirical investigation of stock-for-debt transactions, *Financial Management* 28, 32–45.

Jensen, M., 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review* 76, 323–329.

Jensen, M. and Meckling, W., 1976. Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics* 3, 305-360.

Johnson, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A., 2000. Tunneling. *American Economic Review* 90 (2), 22-27.

Klock, M.S., Mansi, S.A. and Maxwell, W.F., 2005. Does corporate governance matter to bondholders? *Journal of Financial and Quantitative Analysis* 40, 693-719.

La Porta, R., Lopez de Silanes, F., Shleifer, A. and Vishny, R.W., 1998. Law and finance. *Journal of Political Economy* 106, 1113–1155.

Leary, M.T., and Roberts, M.R., 2005. Do firms rebalance their capital structures? *Journal of Finance* 60, 2575–2619.

Lucas, D. and McDonald, R. 1990. Equity issues and stock price dynamics. *Journal of Finance* 45, 1019-1043.

Lundstrum, L.L., 2009. Entrenchment, management, capital structure changes and firm value. *Journal of Economics and Finance* 33,161-175

McConnell, J. and Servaes, H., 1995. Equity ownership and the two faces of debt. *Journal of Financial Economics* 39, 131–157.

Mishra, C.S. and McConaughy, D.L., 1999. Founding family control and capital structure: The risk of loss of control and the aversion to debt. *Entrepreneurship Theory & Practice* 23 (4), 53-64.

Moh'd, M. A., Perry, L. G. and Rimbey, J. N., 1995. An investigation of the dynamic relationship between agency theory and dividend policy. *The Financial Review* 30, 367.

Morck, R., Shleifer, A. and Vishny, R., 1988. Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics*, 20, 293-315.

Myers, S.C., 1977. Determinants of corporate borrowing. *Journal of Financial Economics* 5, 147-175.

Myers, S., 1984. The capital structure puzzle. *Journal of Finance* 39 (3), 575–592.

Myers, S., 2001. Capital structure. *Journal of Economic Perspectives* 15 (2), 81–102.

Nam J., Ottoo, R.E. and Thornton, J.H. Jr., 2003. The effect of managerial incentives to bear risk on corporate capital structure and R&D investment. *The Financial Review* 38,77–101.

Pedersen, T. and Thomsen, S., 2000. Ownership structure and economic performance in the largest European companies. *Strategic Management Journal* 21 (6) 689-705.

Rajan, R.G. and Zingales, L., 1995. What do we know about capital structure? Some evidence from international data. *Journal of Finance* 50, 1421–1460.

Rozeff, M., 1982. Growth, beta and agency costs as determinants of dividend payout ratios. *Journal of Financial Research* 198, 249-259.

Shleifer, A. and Vishny, R.W., 1986. Large shareholders and corporate control. *Journal of Political Economy* 94, 461–488.

Shleifer, A. and Vishny, R.W., 1997. A survey of corporate governance. *Journal of Finance* 52, 737–783.

Siegel, J., 1998. *Stocks for the Long Run*, Second Edition. New York: McGraw Hill.

Sufi, A., 2009. Bank lines of credit in corporate finance: An empirical analysis. *Review of Financial Studies* 22 (3) 1057-1088.

Titman, S. and Wessels, R., 1988. The determinants of capital structure choice. *Journal of Finance* 43, 1-19.

Tufano, P., 1996. Who manages risk? An empirical examination of risk management practices in the gold mining industry. *Journal of Finance* 51, 689-705.

Welch, I., 2004. Capital structure and stock returns. *Journal of Political Economy* 112, 106-131.

Worldscope, 1997. *Data definitions guide*. Bethesda, MD: Disclosure Inc.

Table 1 Variable definition and measures

Market equity is common shares outstanding times the stock price. Market value is defined as total liabilities minus deferred taxes and investment credit, and then plus preferred stock and market equity. Book equity is defined as total asset minus total liability, then plus deferred taxes and investment tax credit minus preferred stock. Book debt is total asset minus book equity.

Variables	Definition and measure	Data Source
(1) Book leverage	Book debt / total asset	Thomson DataStream
(2) Market leverage	Book debt / market value	Thomson DataStream
(3) Book change	Leverage change / total asset	Thomson One Banker
(4) Market change	Leverage change / market value	Thomson One Banker
(1) OC	The sum of percentages of block shareholder (>5%) owned shares.	Thomson One Banker
(2) Profitability	EBITDA: earnings before interest, tax, depreciation	Thomson DataStream
(3) Firm size	Log of total sales	Thomson DataStream
(4) Market-to-book ratio	Market value of asset/ book asset	Thomson DataStream
(5) Sell growth	Change in log of total asset	Thomson DataStream
(6) Asset tangibility	Plant property and equipment/ total asset	Thomson DataStream
(7) Credit rating	A dummy variable that equals one if firm's rating is above A- and zero below A-, referring to S&P bond rating	Thomson One Banker
(8) Dividend	Dividend payout ratio	Thomson DataStream
(9) Tax rate	Ratio of taxes paid to pre-tax income	Thomson DataStream
(10) Non-debt tax shield	Depreciation/ total asset	Thomson DataStream
(11) Equity issue volume	The cumulative volume of monthly equity issues (A three months de-trended moving average of equity issue of each month)	Thomson DataStream
(12) P/E ratio	Average monthly ratio	Thomson DataStream
(13) Cumulative market returns	Annual Value-Weighted Index return.	Thomson DataStream

Table 2 Descriptive statistics of all companies

This table reports the descriptive statistics of the sample of 365 companies over 1997-2009, excluding financials and utilities. The sample is further separated into four groups: all firms, high ownership concentrated firm (high OC), intermediate ownership concentrated firm (intermediate OC), and low ownership concentrated firm (low OC). Book leverage is defined as book debt over total asset. Market leverage is the ratio of book debt to market value. OC represents the sum of shares held by block holders. Profitability is the earnings before interest, taxes and depreciation (EBITDA) over total debt. Firm size is expressed as the log of total sales. Mb ratio is market value of asset. Sales growth is measured by change in log of total asset. Tangibility is calculated as tangible asset over total asset. Dividend expresses common dividend payout ratio. Tax rate is defined as ratio of taxes paid to pre-tax income. Non debt tax shield denotes non-debt tax shield.

	All companies			High OC			Intermediate OC			Low OC		
	No. Obs	Mean	Std	No. Obs	Mean	Std	No. Obs	Mean	Std	No. Obs	Mean	Std
Book leverage	12025	0.5692	0.2681	2478	0.5023	0.2441	3989	0.5709	0.2446	5558	0.5978	0.2884
Market leverage	11454	0.3752	0.1934	2391	0.3452	0.2102	3867	0.3863	0.1926	5196	0.3808	0.1842
OC	11472	0.3352	0.2451	2478	0.6684	0.2825	3989	0.3614	0.7114	5005	0.1495	0.06519
Profitability	12014	0.1340	0.1644	2476	0.1390	0.1665	3983	0.1262	0.1563	5555	0.1374	0.1689
Firm size	11777	12.9546	1.9469	2447	12.1888	1.7518	3954	12.6858	1.6392	5376	13.5009	2.0769
Mb ratio	11454	1.9598	1.8743	2391	2.0485	2.2584	3867	1.8104	1.3540	5196	2.0302	2.0022
Sales growth	11860	0.0605	0.1507	2462	0.0627	0.1590	3967	0.0574	0.1477	5431	0.0617	0.1491
Capital expenditure	10312	0.0616	0.1815	2230	0.0555	0.0867	3504	0.0560	0.0869	4578	0.0689	0.2543
Tangibility	11987	0.3087	0.2486	2478	0.3581	0.2688	3984	0.2780	0.2332	5525	0.3086	0.2463
Dividend	11394	0.0895	0.1236	2414	0.0633	0.1136	3822	0.0756	0.0816	5158	0.1120	0.1477
Tax rate	10190	0.35977	0.9902	2015	0.3290	0.3660	3318	0.3309	0.2925	4857	0.3922	1.3352
Non debt tax shield	11765	0.0371	0.0306	2414	0.0420	0.0350	3886	0.0364	0.0298	5465	0.0354	0.0289

Table3 Issues distribution and firm characteristics of debt and equity issues

The sample consists of all the equity and bond issues from 1997 to 2009. The sample excludes utilities and financials. This table includes the firm statistics of the 273 debt and 289 equity issues over 1997-2009. The sample is further separated into four groups: all issues, high ownership concentrated firms (high OC), intermediate ownership concentrated firms (intermediate OC), and low ownership concentrated firms (low OC). Book leverage is defined as book debt over total asset. Market leverage is the ratio of book debt to market value. OC represents the sum of shares held by block holders. Profitability is the earnings before interest, taxes and depreciation (EBITDA) over total debt. Firm size is expressed as the log of total sales. Mb ratio is market value of asset. Sales growth is measured by change in log of total asset. Tangibility is calculated as tangible asset over total asset. Dividend expresses common dividend payout ratio. Tax rate is defined as ratio of taxes paid to pre-tax income. Non debt tax shield denotes non-debt tax shield. Prin Amt is the principal amount of issuers. Pro Amt is the proceed amount of the issue.

Panel A Debt and equity issues sample distribution

Year	Debt issues			Equity issues		
	No. of Obs	Prin Amt	Pro Amt	No. of Obs	Prin Amt	Pro Amt
1997	97	164.31	164.42	154	105.39	68.44
1998	84	198.16	196.48	154	159.65	106.8
1999	102	265.65	257.66	144	210.93	129.43
2000	126	388.05	385.68	376	165.70	81.86
2001	104	292.87	292.23	383	221.92	79.24
2002	114	257.74	257.12	278	174.37	63.17
2003	100	270.96	270.99	340	44.08	26.23
2004	77	342.65	341.75	358	58.30	37.7
2005	61	368.44	367.42	174	89.25	77.78
2006	113	373.44	372.24	188	98.93	82.53
2007	103	487.99	486.04	318	73.42	57.94
2008	52	625.25	619.23	328	103.30	61.21
2009	71	333.19	331.09	532	149.62	85.21
sum	1216	327.22	325.31	3733	127.17	69.69

Panel B Firm characteristics for debt issues

	All debt issues			High OC			Intermediate OC			Low OC		
	No. Obs	Mean	Std	No. Obs	Mean	Std	No. Obs	Mean	Std	No. Obs	Mean	Std
Book leverage	273	0.6195	0.2674	12	0.7509	0.2659	51	0.6648	0.2185	210	0.6009	0.2758
Market leverage	271	0.4102	0.1451	12	0.6094	0.1608	49	0.4994	0.1505	210	0.3780	0.1242
OC	273	0.1900	0.1438	12	0.6746	0.4370	51	0.3335	0.5640	210	0.127571	0.6014
Profitability	273	0.1291	0.1112	12	0.1514	0.0396	51	0.0872	0.1836	210	0.1379	0.0862
Firm size	273	15.5093	1.4899	12	13.8567	0.6095	51	14.2863	1.1957	210	15.9008	1.3608
Mb ratio	271	1.6072	0.9111	12	1.2100	0.2236	49	1.4038	0.4689	210	1.6774	0.9978
Sales growth	273	0.0555	0.0853	12	0.0968	0.1368	51	0.0444	0.0855	210	0.0558	0.0812
Capital expenditure	263	0.0749	0.1432	12	0.0875	0.0278	48	0.0600	0.1137	203	0.0777	0.1532
Tangibility	273	0.3855	0.2656	12	0.4738	0.1855	51	0.3267	0.2789	210	0.3948	0.2646
Dividend	273	0.1372	0.1868	12	0.0557	0.0624	51	0.0792	0.0681	210	0.1559	0.2062
Tax rate	226	0.5084	1.0499	8	0.3626	0.1227	48	0.3397	0.3027	170	0.5630	1.1955
Non debt tax shield	265	0.0407	0.0310	12	0.0806	0.0625	43	0.0331	0.0286	210	0.0399	0.0272
Prin Amt	250	271.8311	249.6657	12	268.9558	247.9231	50	279.3272	282.1483	188	270.0210	241.8786
Pro Amt	253	278.9378	259.8389	12	268.7392	247.7032	50	278.8434	281.4302	191	279.6033	256.0520

Panel C Firm characteristics for equity issues

	All equity issues			High OC			Intermediate OC			Low OC		
	No. Obs	Mean	Std	No. Obs	Mean	Std	No. Obs	Mean	Std	No. Obs	Mean	Std
Book leverage	289	0.6124	0.3292	70	0.5399	0.2553	98	0.5948	0.2983	121	0.6686	0.3798
Market leverage	273	0.4330	0.2206	65	0.3820	0.2433	95	0.4268	0.2133	113	0.4675	0.2085
OC	289	0.3523	0.2196	70	0.6720	0.1074	98	0.3720	0.6796	121	0.1515	0.0692
Profitability	289	0.1284	0.1634	70	0.1903	0.2039	98	0.1080	0.1329	121	0.1091	0.1514
Firm size	284	12.9309	2.0503	69	12.2477	1.7610	97	12.3946	1.9019	118	13.7712	2.0425
Mb ratio	273	1.7947	1.9971	65	2.5347	3.7482	95	1.6305	0.9523	113	1.5070	0.6877
Sales growth	286	0.1263	0.2401	70	0.1359	0.1963	98	0.1044	0.1458	118	0.1388	0.3153
Capital expenditure	242	0.0584	0.0854	58	0.0501	0.0791	77	0.0651	0.0936	107	0.0582	0.0829
Tangibility	289	0.3044	0.2548	70	0.3616	0.2723	98	0.2698	0.2484	121	0.2993	0.2456
Dividend	277	0.0859	0.1709	67	0.0341	0.0509	95	0.0457	0.0512	115	0.1494	0.2451
Tax rate	231	0.7943	433.2275	59	0.3030	0.1835	79	0.3303	0.2211	93	1.5000	6.7835
Non debt tax shield	281	0.0349	0.0351	70	0.0379	0.0389	96	0.0276	0.0215	115	0.0393	0.0407
Prin Amt	275	163.4793	176.6760	68	107.5887	96.5375	98	139.4313	165.7392	109	219.9680	207.4292
Pro Amt	280	110.3199	144.4776	68	72.7479	85.6825	98	103.4508	141.9315	114	138.6363	167.9090

Table 4 The impact of ownership concentration on firms' leverage ratio by all companies

This table includes 365 UK firms over 1997-2009. The sample excludes utilities and financials. The sample is further separated into four groups: high ownership concentrated firms (high OC), intermediate ownership concentrated firms (intermediate OC), and low ownership concentrated firms (low OC). Book leverage is defined as book debt over total asset. Market leverage is the ratio of book debt to market value. OC represents the sum of shares held by block holders. Profitability is the earnings before interest, taxes and depreciation (EBITDA) over total debt. Firm size is expressed as the log of total sales. Mb ratio is market value of asset. Sales growth is measured by change in log of total asset. Tangibility is calculated as tangible asset over total asset. Dividend expresses common dividend payout ratio. Tax rate is defined as ratio of taxes paid to pre-tax income. Non debt tax shield denotes non-debt tax shield. ***, **, * denote statistical significance at the 1%, 5% and 10% levels, respectively.

$$Leverage_t = \alpha_0 + \alpha_1 OC_t + \alpha_2 Profitability_t + \alpha_3 firmsize_t + \alpha_4 Mbratio_t + \alpha_5 salesgrowth_t + \alpha_6 tangibility_t + \alpha_7 dividend_t + \alpha_8 taxrate_t + \alpha_9 nondebttaxshield_t + u_t$$

	All companies		High OC		Intermediate OC		Low OC	
	Book leverage	Market leverage	Book leverage	Market leverage	Book leverage	Market leverage	Book leverage	Market leverage
Constant	0.25235*** [0.03619]	0.27944*** [0.0215]	0.02312 [0.04307]	0.12716*** [0.03366]	-0.40057*** [0.04667]	0.04973* [0.02933]	0.15061*** [0.03031]	0.35539*** [0.02046]
OC	-0.00116*** [0.000197]	0.000441*** [0.000117]	0.000183 [0.000155]	1.94E-05 [0.000121]	0.00081 [0.000544]	-0.00031 [0.000342]	0.00166** [0.000518]	0.00188*** [0.00035]
Profitability	-0.03951 [0.05821]	-0.79332*** [0.03458]	-0.29669*** [0.05539]	-0.66044*** [0.04328]	0.12244** [0.06183]	-0.69658*** [0.03886]	-0.38839*** [0.05294]	-0.76735*** [0.03573]
Firm size	0.0285*** [0.00245]	0.01865*** [0.00145]	0.04269*** [0.00309]	0.02567*** [0.00242]	0.06651*** [0.00292]	0.0388*** [0.00183]	0.02641*** [0.00194]	0.0118*** [0.00131]
Mb ratio	0.03398*** [0.00219]	-0.01368*** [0.0013]	0.02297*** [0.00258]	-0.01919*** [0.00202]	0.03029*** [0.00381]	-0.05001*** [0.0024]	0.06257*** [0.00245]	-0.03624*** [0.00165]
Sales growth	-0.16372*** [0.02933]	-0.09485*** [0.01742]	-0.1011** [0.03949]	0.00214 [0.03086]	0.18021*** [0.03729]	0.16109*** [0.02344]	-0.10681*** [0.02768]	-0.0875*** [0.01869]
Tangibility	-0.3418*** [0.02482]	-0.03059** [0.01475]	-0.18389*** [0.02128]	0.00665 [0.01663]	-0.11337*** [0.02211]	0.03553** [0.01389]	-0.14792*** [0.01545]	0.01483 [0.01043]

Dividend	-0.0005*	-0.00057***	-0.00082*	0.00218***	0.00109**	9.65E-05	-0.00027	-0.00014
	[0.000285]	[0.000169]	[0.000421]	[0.000329]	[0.000505]	[0.000318]	[0.000235]	[0.000159]
Tax rate	1.95E-05	1.32E-05	0.000321**	0.00036***	0.00018	-2.80E-05	7.60E-06	1.54E-06
	[2.28E-05]	[1.35E-05]	[0.000137]	[0.000107]	[0.000134]	[8.42E-05]	[2.08E-05]	[1.41E-05]
Non debt tax shield	1.55165***	0.68649***	0.55295***	0.63904***	1.05987***	0.91924***	1.68393***	1.04162***
	[0.21489]	[0.12765]	[0.18893]	[0.14762]	[0.18364]	[0.11542]	[0.14517]	[0.098]
R²	0.2105	0.4243	0.2007	0.3406	0.1833	0.4387	0.2195	0.3717
Adjusted R²	0.2083	0.4227	0.1969	0.3375	0.1809	0.437	0.2178	0.3703

Table 5 The impact of ownership concentration on leverage and leverage change by security issues

This table includes 273 debt and 289 equity issues over 1997-2009. The sample excludes utilities and financials. Book leverage is defined as book debt over total asset. Market leverage is the ratio of book debt to market value. Book change is the ratio of proceed amount of security issuance to total asset. Market change is the ratio of proceed amount to market value. OC represents the sum of shares held by block holders. Profitability is the earnings before interest, taxes and depreciation (EBITDA) over total debt. Firm size is expressed as the log of total sales. Mb ratio is market value of asset. Sales growth is measured by change in log of total asset. Capital represents the ratio of capital expenditure to total asset. Tangibility is calculated as tangible asset over total asset. Dividend expresses common dividend payout ratio. Tax rate is defined as ratio of taxes paid to pre-tax income. Non debt tax shield denotes non-debt tax shield. ***, **, * denote statistical significance at the 1%, 5% and 10% levels, respectively.

$$Leverage_t = \alpha_0 + \alpha_1 OC_t + \alpha_2 Profitability_t + \alpha_3 firmsize_t + \alpha_4 Mbratio_t + \alpha_5 salesgrowth_t + \alpha_6 tangibility_t + \alpha_7 dividend_t + \alpha_8 taxrate_t + \alpha_9 nondebttaxshield_t + u_t$$

$$Leverage\ change = \alpha_0 + \alpha_1 OC_t + \alpha_2 Profitability_t + \alpha_3 firmsize_t + \alpha_4 Mbratio_t + \alpha_5 salesgrowth_t + \alpha_6 tangibility_t + \alpha_7 dividend_t + \alpha_8 taxrate_t + \alpha_9 nondebttaxshield_t + \alpha_{10} creditrating_t + u_t$$

	Debt issues				Equity issues			
	Book leverage	Market leverage	Book change	Market change	Book leverage	Market leverage	Book change	Market change
Constant	0.10482 [0.18058]	0.40729*** [0.11855]	0.61552*** [0.18578]	0.20151*** [0.02552]	0.26696* [0.15315]	0.09972 [0.09111]	-0.26602*** [0.04446]	-0.13523*** [0.01752]
OC	0.00271*** [0.000945]	0.00272*** [0.00062]	0.00174 [0.00106]	0.000456*** [0.000146]	-0.00202** [0.000875]	0.000193 [0.000521]	0.000628** [0.000254]	0.000215** [0.0001]
Profitability	-0.35048 [0.27121]	-0.618*** [0.17805]	0.57589* [0.29391]	0.13416*** [0.04038]	-0.57676** [0.23035]	-0.61581*** [0.13704]	-0.21009*** [0.05963]	0.00687 [0.0235]
Firm size	0.01378 [0.01068]	0.00513 [0.00701]	-0.05388*** [0.011]	-0.01376*** [0.00151]	0.02942*** [0.01051]	0.02426*** [0.00625]	0.01785*** [0.00291]	0.00765*** [0.00115]
Mb ratio	0.1943*** [0.01688]	-0.02803** [0.01108]	0.1067*** [0.01818]	-9.90E-05 [0.0025]	0.07116*** [0.01295]	0.00297 [0.0077]	-0.02506*** [0.00362]	0.00252* [0.00142]
Sales growth	0.17069 [0.13717]	0.11784 [0.09005]	0.11313 [0.01818]	0.02213 [0.02149]	-0.20825* [0.09082]	-0.09608* [0.05403]	-0.01418 [0.02674]	-0.00629 [0.01054]
Tangibility	-0.35792*** [0.05248]	-0.18823*** [0.03445]	0.08682 [0.05348]	0.03301*** [0.00735]	-0.00596 [0.07785]	0.32945*** [0.05403]	0.05457** [0.02154]	0.00803 [0.00849]

Dividend	-0.00022 [0.000568]	-0.00022 [0.000373]	-0.00059 [0.000596]	2.32E-05 [8.19E-05]	-0.00127 [0.00154]	-0.00063 [0.000918]	-7.30E-05 [0.00067]	-4.70E-06 [0.00849]
Tax rate	-0.00023** [0.00011]	-8.90E-05 [7.23E-05]	0.000261*** [7.25E-05]	4.16E-05*** [9.95E-06]	-1.20E-05 [3.94E-05]	-6.60E-06 [2.35E-05]	-3.20E-06 [1.18E-05]	2.18E-06 [4.65E-06]
Non debt tax shield	3.804*** [0.56326]	2.37927*** [0.36977]	-1.22779** [0.58807]	-0.32232*** [0.08079]	1.06704 [0.78653]	-0.68033 [0.4679]	0.04184 [0.21219]	-0.20785* [0.08362]
Credit rating	0.000867 [0.0308]	-0.01474 [0.02019]	0.00302 [0.03347]	-0.00035 [0.0046]				
R²	0.6577	0.494	0.4234	0.4912	0.2326	0.4384	0.6045	0.2273
Adjusted R²	0.6393	0.4667	0.3992	0.4698	0.1954	0.4111	0.5891	0.1972

Figure 1 Stock market conditions measured by cumulative market return



Figure 2 Stock market conditions measured by P/E ratio

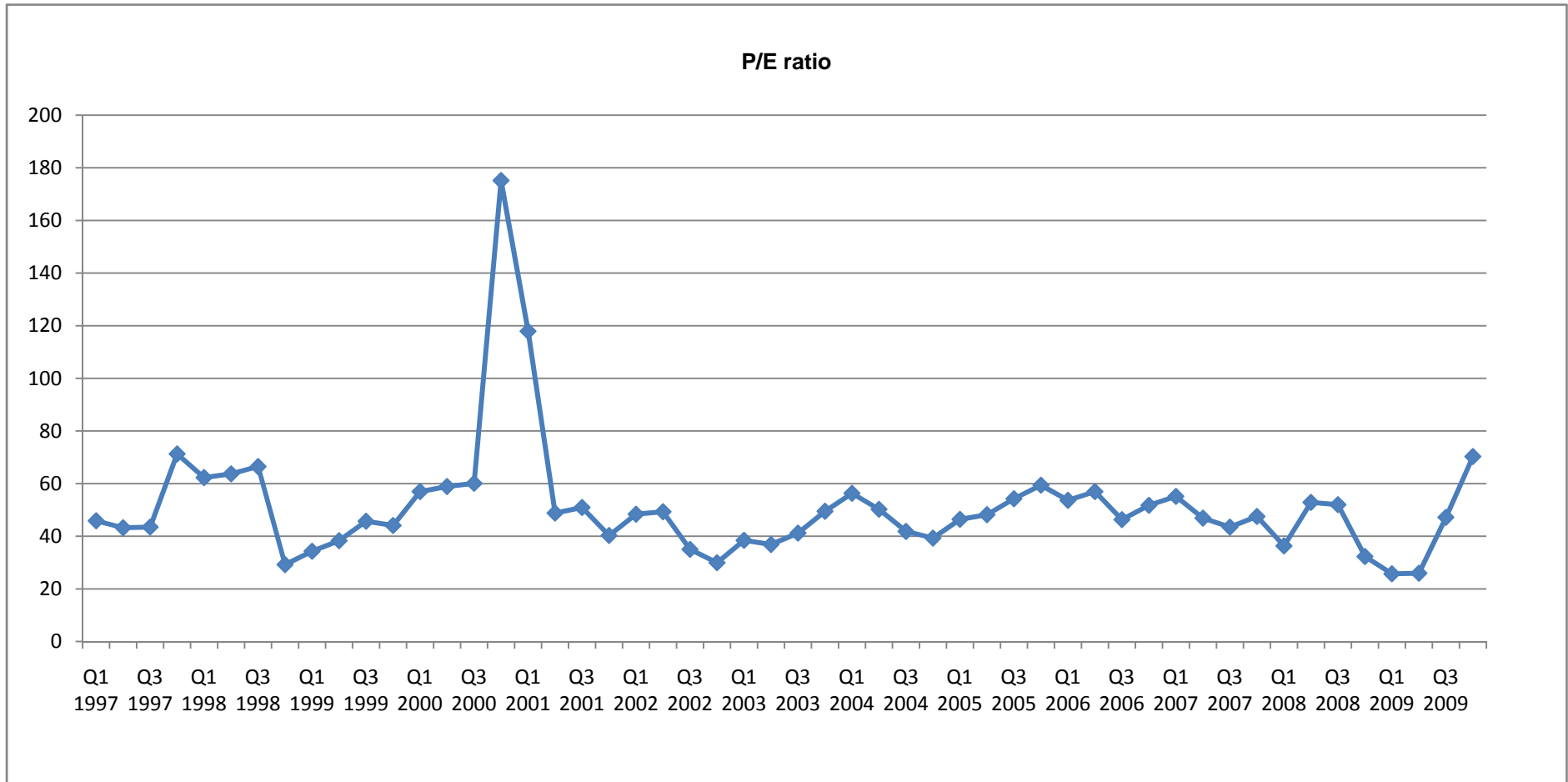


Figure 3 Stock market conditions measured by cumulative equity volume

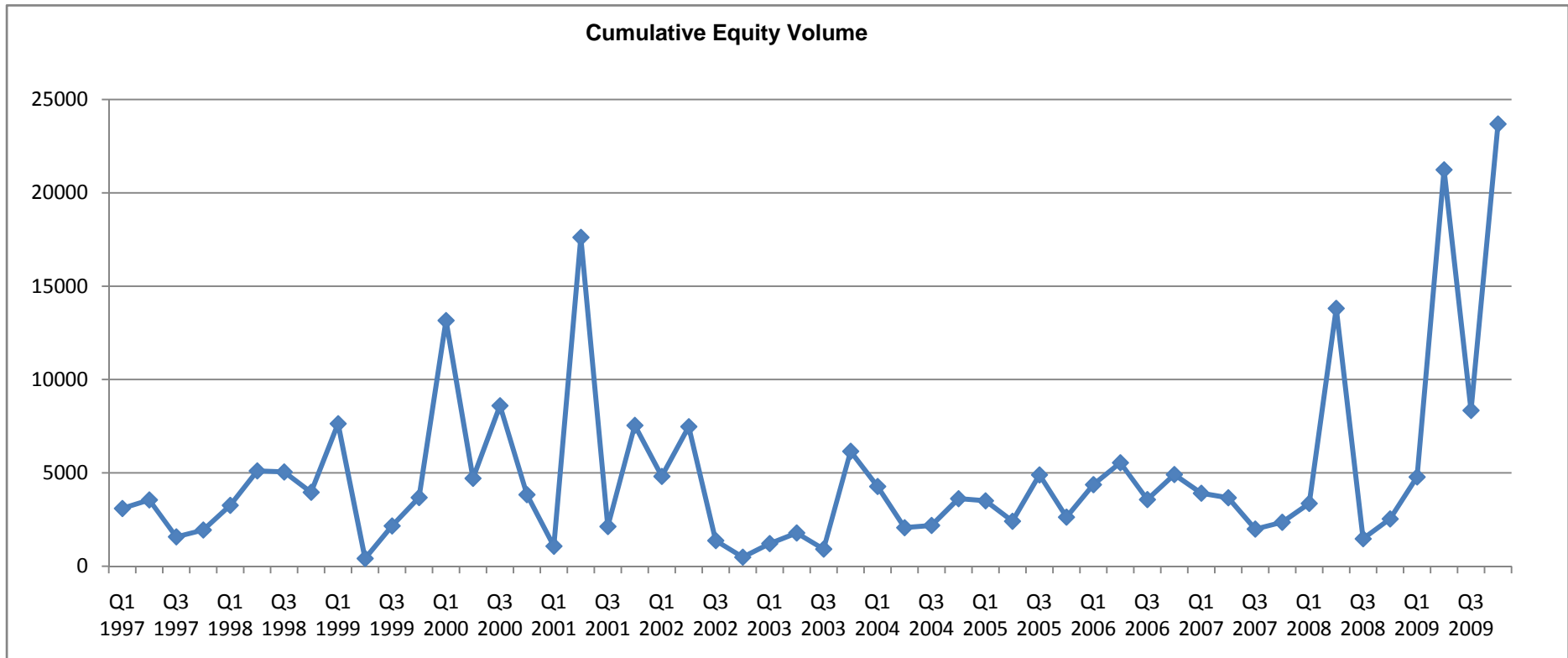


Table 6 The impact of ownership concentration on leverage change under different stock market conditions

This table includes 273 debt and 289 equity issues over 1997-2009. The sample excludes utilities and financials. Three measures are applied - cumulative market returns, P/E ratio and cumulative equity volumes - to divide stock market into cold, median and hot conditions respectively. Book change is the ratio of proceed amount of security issuance to total asset. Market change is the ratio of proceed amount to market value. OC represents the sum of shares holding by block holder. Profitability is the earnings before interest, taxes and depreciation (EBITDA) over total debt. Firm size is expressed as the log of total sales. Mb ratio is market value of asset. Sales growth is measured by change in log of total asset. Tangibility is calculated as tangible asset over total asset. Dividend expresses common dividend payout ratio. Tax rate is defined as ratio of taxes paid to pre-tax income. Non debt tax shield denotes non-debt tax shield. D1 is defined as OC times cold stock market dummy. D2 is defined as OC times hot stock market dummy. Cold stock market condition is a dummy variable equal to 0 when the stock market condition is ranked in the bottom 30%, and 1 otherwise. Hot stock market is also a dummy variable, equal to 1 when the stock market condition is in the top 30% of the whole research period and 0 otherwise.***, **, * denote statistical significance at the 1%, 5% and 10% levels, respectively.

$$\text{Leverage change} = \alpha_0 + \alpha_1 OC_t + \alpha_2 D1_t + \alpha_3 D2_t + \alpha_4 \text{Profitability}_t + \alpha_5 \text{firm size}_t + \alpha_6 \text{Mbratio}_t + \alpha_7 \text{sales growth}_t + \alpha_8 \text{tangibility}_t + \alpha_9 \text{dividend}_t + \alpha_{10} \text{tax rate}_t + \alpha_{11} \text{nondebt tax shield}_t + \alpha_{12} \text{crediting}_t + u_t$$

	Cumulative market returns				P/E ratio				Cumulative equity volumes			
	Debt issues		Equity issues		Debt issues		Equity issues		Debt issues		Equity issues	
	Book change	Market change	Book change	Market change	Book change	Market change	Book change	Market change	Book change	Market change	Book change	Market change
Constant	0.55849*** [0.19224]	0.18663*** [0.02609]	-0.2812*** [0.04407]	-0.1384*** [0.01752]	0.60245*** [0.16981]	0.20318*** [0.02337]	-0.2808*** [0.04469]	-0.1451*** [0.0176]	0.58543*** [0.17004]	0.20598*** [0.02315]	-0.28071*** [0.04481]	-0.14565*** [0.01769]
OC	0.000926 [0.00118]	0.000259 [0.000161]	0.000218 [0.000307]	5.37E-05 [0.000122]	0.00266** [0.00118]	0.00055*** [0.000162]	0.000748*** [0.00027]	0.000302*** [0.000106]	0.00198* [0.00114]	0.000516*** [0.000155]	0.000564** [0.000271]	0.000212** [0.000107]
D₁	0.00232* [0.00121]	0.000523*** [0.000164]	0.000514** [0.000253]	0.000224** [0.0001]	-0.00184 [0.00139]	-0.00015 [0.000192]	0.000319 [0.000291]	0.0001654 [0.000114]	-0.00148 [0.00145]	-0.00046** [0.000198]	0.000447 [0.000299]	0.000251** [0.000118]
D₂	-0.00181 [0.00131]	-0.00033* [0.000177]	0.000542* [0.000324]	-2.80E-05 [0.000129]	-0.00183 [0.00117]	-0.0002 [0.000161]	-0.00039 [0.000259]	-0.000249** [0.000102]	-0.00051 [0.00114]	-0.00015 [0.000155]	2.95E-05 [0.000259]	-7.975E-05 [0.000102]
Profitability y	0.61757**	0.14416***	-0.17812***	0.01654	0.61425**	0.13556***	-0.2225***	0.00148	0.62865**	0.14569***	-0.20162***	0.01539

	[0.00131]	[0.03988]	[0.05977]	[0.02377]	[0.2931]	[0.04034]	[0.05964]	[0.02349]	[0.29484]	[0.04014]	[0.05954]	[0.0235]
Firm size	-0.05118***	-0.01303***	0.01886***	0.00792***	-0.05391***	-0.01393***	0.01834***	0.00786***	-0.05189***	-0.01388***	0.01855***	0.00805***
	[0.00131]	[0.00153]	[0.00289]	[0.00115]	[0.01024]	[0.00141]	[0.00293]	[0.00115]	[0.01022]	[0.00139]	[0.00295]	[0.00116]
Mb ratio	0.1057***	-0.00031	-0.02589***	0.00243*	0.10598***	-8.6E-05	-0.02379***	0.00331**	0.10441***	-0.00077	-0.02455***	0.00273*
	[0.01811]	[0.00246]	[0.00358]	[0.00142]	[0.01821]	[0.00251]	[0.00363]	[0.00143]	[0.01831]	[0.00249]	[0.00364]	[0.00144]
Sales growth	0.17192	0.03636*	-0.00454	-0.00428	0.16842	0.02635	-0.00694	-0.00146	0.12632	0.01959	-0.01124	-0.00409
	[0.16072]	[0.02181]	[0.02653]	[0.01055]	[0.15307]	[0.02107]	[0.02672]	[0.01052]	[0.15354]	[0.0209]	[0.02669]	[0.01053]
Tangibility	0.09498*	0.03448***	0.05092**	0.00706	0.10977**	0.03507***	0.05617**	0.01053	0.0925*	0.03361***	0.05647***	0.01164
	[0.05362]	[0.00728]	[0.02125]	[0.00845]	[0.05404]	[0.00744]	[0.02112]	[0.00832]	[0.05316]	[0.00724]	[0.02137]	[0.00844]
Dividend	-0.0005	4.03E-05	-0.00017	-4.30E-05	-0.00047	3.94E-05	-0.00014	-4.99E-05	-0.00065	9.15E-06	-0.00011	-3.678E-05
	[0.000595]	[8.07E-05]	[0.000662]	[0.000263]	[0.000604]	[8.31E-05]	[0.000668]	[0.000263]	[0.000599]	[8.15E-05]	[0.000669]	[0.000264]
Tax rate	0.000261***	4.15E-05***	-2.80E-06	2.30E-06	0.000286***	4.4E-05***	-5.7E-06	-1.76E-07	0.000266***	4.31E-05***	-5.8E-06	-1.98E-07
	[7.23E-05]	[9.81E-06]	[1.16E-05]	[4.62E-06]	[7.37E-05]	[1.01E-05]	[1.16E-05]	[4.55E-06]	[7.26E-05]	[9.89E-06]	[1.16E-05]	[4.59E-06]
Non debt tax shield	-1.34848**	-0.3466***	-0.01158	-0.23369***	-1.42365**	-0.34071***	0.09323	-0.17678**	-1.30398**	-0.34842***	0.00598	-0.2364***
	[0.58917]	[0.07995]	[0.21117]	[0.08396]	[0.59917]	[0.08247]	[0.21255]	[0.08371]	[0.59489]	[0.08099]	[0.21364]	[0.08432]
Credit rating	0.00378	-0.00028			-0.00094	-0.00045			-0.00531	-0.00192		
	[0.03337]	[0.00453]			[0.03286]	[0.00452]			[0.03349]	[0.00456]		
R-Square	0.6577	0.494	0.6192	0.2426	0.4294	0.4945	0.6103	0.2396	0.425	0.5017	0.6067	0.2293
R-Sq	0.6393	0.4667	0.6013	0.207	0.4032	0.4712	0.5935	0.2069	0.3985	0.4788	0.5898	0.1962