Ownership, Capital Structure and Financing Decision: Evidence from the UK

Abstract

This paper examines whether and to what degree agency conflicts in ownership structure affect firm leverage ratios and external financing decisions, using a universal sample of UK firms from 1998 to 2012. We use two distinctive measures to capture ownership structure, namely, managerial share ownership (MSO) and institutional ownership. Our empirical results show a non-monotonic relation between MSO and the debt ratio, supporting two competing theories: interest alignment theory and the management entrenchment hypothesis. Nevertheless, institutional ownership is found to be positively related to firm leverage levels. Our results further suggest that firms with concentrated MSO decrease their leverage by increasing the probability of issuing equity over bonds, an effect strengthened during hot market periods.

Keywords: ownership, capital structure, market valuation, security issuance, agency theory.

JEL Classification: G14; G 32; G33.

1. Introduction

In corporate governance, ownership structure is a crucial instrument in alleviating agency problems. Previous research (e.g., Anderson et al., 2003; Morck et al., 1988) provides evidence that agency conflicts in ownership structure have an impact on firm performance, but only a handful of studies look into how ownership structure affects firm capital structure by considering agency problems. This paper examines whether and to what degree agency conflicts in ownership structure affects firm leverage ratios and external financing decisions, using a universal sample of UK firms from 1998 to 2012.

A vibrant strand of capital structure research follows Jensen and Meckling (1976) in using owner–manager agency conflict to argue that managers make capital structure decisions to promote their own wealth, such that their behavior does not maximize firm value. Debt is a disciplining device that can be used to alleviate such agency problems by constraining management overinvestment behavior (Grossman and Hart, 1980, Jensen, 1986). In this case, entrenched managers who have discretion over capital structure choice pursue lower debt levels to avoid the disciplining role of debt. Further, they have an incentive to protect their under-diversified human capital from bankruptcy risk associated with debt (Jensen, 1986; Friend and Lang, 1988). Zwiebel (1996) further argues that entrenched managers only issue debt as a defensive device to commit sufficient value when their empire building is threatened by potential takeover and dismissal. Consistent with this argument, Berger et al. (1997) find that firm debt levels increase following entrenchment-reducing events, such as involuntary CEO turnover, unsuccessful tender offers, and the arrival of a new board of directors. However, Harris and Raviv (1991) and Stulz (1988) suggest that entrenched managers prefer more than the optimal amount of debt to inflate their equity voting power and avoid takeover threats. Given these inconsistent views of the influence of managerial incentive on firm debt levels, the first goal of this study is to explore how MSO influences the capital structure decisions of firms and provide further insight into the predictions above.

Moreover, Shleifer and Vishny (1986) point out that the presence of an external blockholder can help dampen the effect resulting from standard owner–manager conflicts of interest, since concentrated ownership leads to intense managerial monitoring. An active monitoring mechanism can limit the scale of managerial opportunism and resolve the issue of managers adjusting the capital structure of firms to serve their own interests. Institutional shareholders, by virtue of their large shareholdings, have stronger incentives and better skills to monitor management relative to minority shareholders (Grossman and Hart, 1980).[1] This is because they can enjoy greater benefits through monitoring and have greater voting power against financial policies that reduce shareholder wealth (e.g., Ashbaugh et al., 2006; Bhojraj and Sengupta, 2003; Shleifer and Vishny, 1986). In this case, the cost of debt should be lower in firms with higher institutional ownership. Given this viewpoint, the second goal of this study is to examine whether the presence of institutional shareholders encourages firms to choose debt as a governance mechanism to constrain managerial entrenchment.

Proper management of firm ownership structure can have a significant effect on firm leverage levels, echoing the argument of Brailsford et al. (2002), Florackis and Ozkan (2009), and Friend and Lang (1988). Such an effect is generally imposed via a firm's external financing activities, since, in practice, security issues and proceeds are used to directly affect capital structure. Therefore, this paper further examines the role of ownership structure on the external financing decisions of firms, using a dataset of UK bond and equity issues. Our study is in line with recent work by Lundstrum (2009), who investigates 111 financing offerings of US firms and finds a positive relation between MSO and a decline in leverage after issuance.

In addition, the literature suggests that market valuation interplays with ownership structure in determining leverage levels and external financing policies. Baker and Wurgler (2002) argue that firms raise external funds when their cost of equity is temporarily low and that previous equity issues have a long-lasting impact on leverage. Welch (2004) states that the fluctuation of a firm's own stock price is one of the primary determinants of capital structure changes. For

[1] The literature recognizes that individual investors who own a small fraction of shares expect others to take responsibility for monitoring, because their cost of monitoring is generally much higher than their returns (Grossman and Hart, 1980).

example, a firm's stock price is likely to be overvalued because of rising demand from investors under hot market conditions. This naturally leads to MSO diffusion due to equity issues and share selling and thus lowers debt levels. In this line, Pedersen and Thomsen (2000) consider stock market valuation a probable determinant of firm ownership structure. However, the relation and, more specifically, the directions of the relation between market valuation, ownership structure, and external financing decisions are far from conclusive (e.g., Florackis and Ozkan, 2009; Pedersen and Thomsen, 2000). The third goal of this paper is to examine the moderating effect of market valuation on the relation between ownership structure and external financing channels.

Our study makes several contributions to the literature. First, this paper starts by recreating earlier findings of the relation between ownership and firm leverage (e.g., Florackis and Ozkan, 2009; Lundstrum, 2009). However, in addition to MSO, our analysis considers institutional ownership a key measure that leads to a more complete capture of ownership structure. In contrast to the work of Lundstrum (2009), our analysis focuses on UK listed firms. The UK market provides an interesting context for our study: UK firms are generally characterized as having widely dispersed ownership, with a growing concentration of institutional holdings. Short and Keasey (1999) suggest that, compared to the US market, UK managers become more entrenched at higher levels of ownership and institutional investors are better able to coordinate their monitoring activities. Additionally, UK bankruptcy law strictly enforces creditor rights against management and equity holders when a firm succumbs to financial distress (Rajan and Zingales, 1995). Therefore, managers in UK firms are more conservative in debt issuance, although strict enforcement reduces the cost of debt.

Second, we extend the study of Lundstrum (2009) by investigating whether and to what degree MSO, or institutional ownership, affects the external financing policies of firms, including the choice between bond and equity issues and the size of the issue. Moreover, unlike Lundstrum, we consider the relation between ownership and financing decisions under different market valuations. It is hypothesized that hot and cold market valuations limit managerial entrenchment and hence lower agency costs. We argue that both managers and

institutional shareholders benefit (suffer) from equity issuance because of the lower (higher) costs of equity in hot (cold) markets. To address this issue, we explicitly take into account different (hot/cold) market valuations to interact with firm ownership proxies and assess their impact on external financing decisions.

Our study also addresses how the recent financial crisis has influenced the capital structure and financial decisions of firms, given that managerial and shareholder interests are naturally aligned and owner–manager conflicts over risk choice vanish with the threat of firm bankruptcy. In this setting, both managers and institutional investors are more concerned with firm survival; thereby, firms are more likely to lower their leverage levels by issuing equity over bonds. This study provides strong empirical evidence to support this argument.

The remainder of this paper proceeds as follows. Section 2 reviews the literature and sets forth the arguments underlying the main hypotheses. Section 3 presents our sample selection and summary statistics. Section 4 discusses the main findings of the empirical analysis. Finally, Section 5 concludes the study.

2. Hypothesis Development

Due to the different incentives of various investors, our study develops several hypotheses regarding the effects of MSO and institutional ownership on the capital structure decisions of firms.

2.1. MSO and Capital Structure Decisions

A considerable body of research from the managerial perspective suggests that the financing decisions of firms are greatly influenced by their managers' objectives, desires, and preferences (e.g., Jensen, 1986; Grossman and Hart, 1980; Myers and Majluf, 1984; Zwiebel, 1996). Jensen (1986) argues that the managerial moral hazard problem has a significant effect on capital structure decisions. To pursue growth, managers may engage in projects with negative

net present value (NPV), particularly if the firm has a large amount of free cash flow after financing all positive-NPV projects. The obligations associated with debt can reduce such free cash available for managers' personal wealth (Grossman and Hart, 1980). Nevertheless, managers may avoid debt to preserve their managerial opportunism, consistent with empirical evidence that firms with stronger managerial control power tend to use less debt (Berger et al., 1997).

In the model of Zwiebel (1996), entrenched managers adopt a capital structure by trading off empire-building ambitions with the need to ensure sufficient efficiency and to prevent control challenges. On the one hand, managers voluntarily issue debt to restrict themselves, using potential bankruptcy as a way to commit credibly and to forgo inefficient investment, thereby preventing a takeover. As such, issuing debt implies that a firm is committed to undertake operating improvements and can generate sufficient earnings to repay its debt (Leland and Pyle, 1977). Berger et al. (1997) find that entrenched managers raise debt when managerial security is challenged by the possibility of failure in tender offers or involuntary CEO replacement. On the other hand, Zwiebel (1996) proposes that self-interested managers will decrease debt levels to avoid the disciplining role of debt and the threat of a bankruptcy. Since managers bear non-diversifiable employment risk linked to firm survival, bankruptcy or financial distress will result in their demotion or loss of employment (Brailsford et al., 2002; Friend and Lang, 1988). In this context, risk-averse managers are more reluctant to raise firm debt levels to protect their undiversified human capital.

According to two competing theories, interest alignment theory (Jensen and Meckling, 1976) and managerial entrenchment theory (Fama and Jensen, 1983), some studies find a curvilinear relation between MSO and leverage (e.g., Brailsford et al., 2002; Florackis and Ozkan, 2009). When MSO is relatively low, increasing debt levels can reduce managerial incentives to engage in non-optimal activities and thereby align managerial and shareholder interests. Under this scenario, managers use debt financing to alleviate the agency cost of free cash flow (Jensen, 1986) and thereby retain control (Zwiebel, 1996). However, when MSO surpasses a "changeover" point, managers have more discretion adjusting debt levels in their own interest

(Brailsford et al., 2002). Such entrenched managers have more incentive to lower firm debt levels, to avoid the pressure of interest payment commitments (Jensen, 1986), and to reduce bankruptcy risk and the associated loss of entrenchment (Zwiebel, 1996). Therefore, we propose the following hypothesis.

H1a: *The relation between MSO and firm leverage is non-monotonic. This relation is positive for lower degrees of MSO and negative at higher degrees.*

Using the underlying agency theory and following the survey evidence to date (e.g., Berger et al. 1997; Bayless and Chaplinsky, 1996), we expect a strong linkage between managerial ownership and the choice between equity and bonds.

In the adverse selection model of Myers and Majluf (1984), managers choose bond issues over equity issues to reduce the underinvestment problem. This problem is caused by the presence of information asymmetry, where existing shareholders are more informed about the value of a firm than new investors are. Assuming that managers act in the interest of existing shareholders, they only finance a new project by issuing equity if the firm lacks internal funds or the growth opportunity is risky. As a result, new shares are underpriced by the market. Firms will reject even positive-NPV projects if the underpricing of new capital is higher than the value of the project. This underinvestment can be reduced by funding the project using a financing method that is less likely to be mispriced by the market. Therefore, managers will consider internal funds a first choice, followed by debt issues, and equity issues as a last resort, as suggested by pecking order theory (Myers and Majluf, 1984).

Nevertheless, contemporary managers are expected to tend to issue equity, based on several conjectures. First, regular interest on debt reduces the probability of management overinvestment (Jensen, 1986). Second, managers are unwilling to accept monitoring by outside debt creditors (Zwiebel, 1996). Third, high debt levels correspond to a high risk of financial distress and bankruptcy. Since managers bear non-diversifiable employment risk linked to firm survival, bankruptcy or financial distress will result in their demotion or loss of

employment (Brailsford et al., 2002; Friend and Lang, 1988). In other words, when loss of control is less of a concern, firms are more likely to fund their growth with equity issues. We propose the following hypothesis.

H1b: *A firm with higher MSO is likely to choose equity over bond financing to secure external funds.*

2.2. Institutional Ownership and Capital Structure Decisions

According to the active monitoring hypothesis, the presence of institutional investors can mitigate the managerial moral hazard problem by closely monitoring firm performance (Jensen, 1986; Shleifer and Vishny, 1986). The benefits of monitoring cash flow motivate external investors to bear the costs. Compared with individual investors, institutional investors can efficiently monitor managers when they have access to various sources of information and large stakes in a firm. A high degree of institutional ownership (institutional OC) ensures managers will follow corporate strategies in the interests of shareholders (Barclay and Warner, 1993; Grossman and Hart, 1980).

In corporate governance, the role of institutional investors is known as institutional shareholder activism, which can effectively reduce the costs of debt financing. Typical institutional shareholders—pension funds, mutual funds, insurance companies, and banks—have the capacity to monitor and affect investment strategies to their own benefit. Ashbaugh et al. (2006) and Bhojraj and Sengupta (2003) find that firms with concentrated institutional ownership achieve lower yields and higher ratings on their new bond issues. Klein and Zur (2009) document that hedge fund targets usually issue continuous payouts in the form of interest payments to creditors to reduce the free cash flow problem. Hence their leverage levels are higher.[2] We therefore present the following hypothesis.

H2a: *Institutional OC is positively related to firm leverage.*

[2] Our study examines the relation between the degree of institutional ownership and capital structure. For simplicity, we do not consider different types of institutional investors in this paper.

Following the argument above, large institutional holdings are expected to be associated with high debt ratios because of the lower cost of debt. Therefore, we propose the following hypothesis.

H2b: *A firm with high institutional OC is likely to choose bonds over equity financing to secure external funds.*

2.3. Impact of Market Valuation on the Relation between Ownership and Financing Decisions

According to market timing theory, managers time equity offerings to take advantage of the temporarily lower cost of equity (e.g., Baker and Wurgler, 2002; Hovakimian et al., 2001). Baker and Wurgler (2002) find that high market values, relative to book and past market values, are associated with a higher probability of firms issuing equity. They also conclude that a firm's capital structure is the result of cumulative managerial attempts to time equity issues. Moreover, Loughran et al. (1994) define market timers as firms that issue equity in a hot issue market, characterized by high equity volume. They find that the issuing firm can take advantage of such conditions to simultaneously schedule new issues and maximizes issue proceeds. Ljungqvist et al. (2006) explain this hot market phenomenon based on investor sentiment, where favorable market valuation generates wild bullishness from investors about the prospects of issuing firms. Investors are more (less) willing to purchase new shares during hot (cold) markets, leading to higher (lower) price reactions than in other periods (Bayless and Chaplinsky, 1996).

In addition, entrenched managers may perceive the issue of equity in a hot market as a good opportunity to solidify managerial control, due to two conjectures. First, the wealth of existing shareholders can be increased by issuing equity upon overvaluation (e.g., Loughran and Ritter, 1995; Ljungqvist et al., 2006). Managers can benefit from the equity-based compensation (such as options) and the higher reputation in the labor market through lower

risks of replacement (Jensen, 2004). Second, hot-market equity issues are associated with larger proceeds (Loughran et al., 1994). With discretionary cash flow in hand, managers tend to invest excessively to build larger firms or engage in inefficient investments from which they can gain more private benefits and perquisites, leading to enhanced empire building (e.g., Jensen, 1986, 2004; Jensen and Meckling, 1976).

Combining the arguments above, we further investigate whether the impact of managerial ownership on financing channels via equity or debt varies in accordance with stock market valuation. Thus, we further propose the following hypothesis.

Hypothesis 3a: *A hot (cold) stock market valuation strengthens (weakens) the effect of MSO on the probability of issuing equity.*

In this case, existing institutional investors are expected to have the same incentives in their financing decisions. Thus we propose the following hypothesis.

Hypothesis 3b: *A hot (cold) stock market valuation strengthens (weakens) the effect of institutional OC on the probability of issuing equity.*

3. Data and Methodology

3.1. Sample Selection

We obtain accounting and market price data from Datastream for the sample period 1998 to 2012. We derive information on ownership and security issues from Thomson One Banker. When ownership data were missing, we manually collected them from annual company reports. We include the equity ownership of managers and large institutional investors for each

firm. We exclude observations where the total percentage of all blockholders (O/S% > 3%[3]) exceeds 100%.

To examine the impact of ownership on firm leverage, the sample consists of UK firms in the FTSE All Share Index. Due to the limited ownership information provided by Thomson One Banker, the research period is restricted to 15 years, from 1998 to 2012. The ownership dataset represents all firms' shareholder information for each year, including investor type, investment style, and O/S%. We exclude firms in the finance industry (Standard Industrial Classification, or SIC, codes 6000–6999) and utilities (SIC codes 4900–4949) from the sample because the leverage ratio in the finance industry differs significantly from that of non-financials and the utility industry operates under a tight regulatory regime, with limited scope for corporate control. The final overall sample consists of 4,137 firm–year observations for 383 firms over 15 years. The missing observations are mainly introduced because of two reasons: First, firms are both entering and exiting the FTSE All Share Index during the sample period. Second, some firms were missing values and were deleted from recent releases of the Thomson One Banker and Datastream databases.

We examine all UK firm bond and equity issues reported by Thomson One Banker over this 15-year period. Our sample excludes secondary offerings, initial public offerings, convertible debt, joint debt and equity offerings, preferred stocks, and serial offerings. After excluding financials and utilities firms, we reduce the initial sample size to 4,604 equity offerings and 1,080 bond offerings. Our study focuses on relatively large offerings,[4] with issue proceeds exceeding £1 million, for a sample of 2,851 equity issues and 940 bond issues. We match ownership and firm characteristics with offering activities. The final sample comprises 772 bond and 530 equity issuances.

[3] Thomson One Banker defines O/S% as the percentage of total shares outstanding that a shareholder holds of a firm, calculated by dividing investor share positions in the firm by the firm's most recent publicly available total number of shares outstanding.

[4] Small equity and bond issuances have less impact on a firm's overall capital structure and therefore we set the cutoff point at £1 million pounds; however, for a robustness test, we also use a £500,000 cutoff and the results remain unchanged.

3.2. Key Measure Constructs

This study defines MSO as the percentage of a firm's outstanding shares owned by all executive and non-executive directors.[5] According to Morck et al. (1988) and Lundstrum (2009), we classify MSO into three different levels: low, under 5%; medium, 5–25%, and high, above 25%.

Our empirical study defines institutional OC as the proportion of equity owned by institutional holders who own at least 3% of the firms' outstanding shares held by all institutional investors. As displayed by Thomson One Banker, institutions are specified as investment manager holders.[6]

In reference to the common concept of a hot market (e.g., Helwege and Liang, 2004), we identify the state of the current market by ranking three-month moving averages of scaled equity issue volumes. The scaled issue volume is the aggregate equity issue volume divided by the month-end value of outstanding equity for the London Stock Exchange. The dummy variable Hot (Cold) equals one when the valuation of the current market is in the top (bottom) 30% of the entire research period and zero otherwise.

We follow Fama and French (2002) in defining a firm's debt level, Leverage (market), as the book value of debt over the market value. Book debt is total assets minus book equity. Book equity is calculated as total assets minus total liabilities plus investment tax credits minus preferred stock. Market value is computed as total liabilities minus investment credits plus preferred stock and market equity, where market equity is the number of common shares outstanding times the stock price. Similar to Florackis and Ozkan (2009), we also use an alternative leverage measure, Leverage (book), which is defined as the ratio of total debt to total assets.

[5] Our study does not separate non-executive ownership from MSO because of the limitations of the data.
[6] Thomson One Banker defines an investment manager as a buy-side institution that has discretionary power over assets under management and that makes buy/sell decisions.

3.3. Other Determinants of Capital Structure and Financing Decisions

In addition to ownership structure, other factors that affect firm leverage ratios and external financing policies can be grouped by firm-specific characteristics such as tangibility, profitability, the market-to-book ratio, sales growth, dividends, non-debt tax shield, and credit rating. The effect of each of these variables on capital structure decisions is well documented (Anderson et al., 2003; Frank and Goyal, 2009). We calculate all of these variables, including the ownership constructs above, at the end of the preceding calendar year.

The tangibility of firm assets is closely associated with agency costs of debt and the cost of financial distress (Myers, 1977), which is the ratio of tangible assets to total assets.[7] Firms with more tangible assets are better able to secure debt, since these assets can be used as collateral (Jensen and Meckling, 1976). In the case of liquidation, tangible assets are worth more than intangible assets. Hence, bondholders generally demand a lower risk premium. This indicates that asset tangibility has a positive effect on leverage (Titman and Wessels, 1988).

We define firm profitability as earnings before interest, taxes, depreciation, and amortization over total assets. More profitable firms have lower costs of bankruptcy and financial distress. Moreover, 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, profitable firms probably have more internal funding to invest in new projects. Conversely, less profitable firms need to resort to debt financing.

We define a firm's market-to-book ratio as the ratio of total assets minus the book value of equity plus the market value of equity to the book value of assets. The market-to-book ratio is the most widely used indicator to predict firm growth opportunities. It can also capture changes in leverage brought about by equity mispricing. According to asymmetric information theory, overvaluation causes firms to issue equity but, when stock prices are undervalued, they

[7] The definition of tangibility is the ratio of property, plant, and equipment over total assets.

purchase shares or issue debt. Therefore firms with higher market-to-book ratios should have lower debt levels via equity issuance.

Sales growth is measured by the change in the logarithm of total assets, which is considered an alternative measure of firm growth. Typically, low-growth firms can carry more debt in their capital structure because they are more secure and stable, incurring lower agency costs of debt. On the other hand, high-growth firms 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, which fear losing control to the bank.

Based on agency and market efficiency theory, a firm's dividend payout ratio is considered an important factor adversely impacting leverage (Rozeff, 1982). However, Chang and Rhee (1990) argue that firms with high dividend payout ratios are likely to issue more debt than those with low payout ratios. They reason that this is due to the effective capital gain tax rate being lower than the dividend tax rate. In the present study, we use the term *dividend* to express a common dividend payout.

The non-debt tax shield is an inverse proxy for the effect of tax on the leverage ratio (Frank and Goyal, 2009). Trade-off theory posits that firms increase their debt to take advantage of higher-interest tax shields (Haugen and Senbet, 1987). DeAngelo and Masulis (1980) demonstrate that non-debt tax deductions can be used to describe the tax shield benefits of debt. Titman and Wessels (1988) further employ the depreciation ratio, net operating loss carry forwards, and investment tax credits as proxies for non-debt tax shields. Our regressions define the non-debt tax shield as the ratio of depreciation to total assets.

To examine the impact of the recent financial crisis on capital structure, we construct a dummy variable, Crisis, that takes the value of one if the issue took place between January 1, 2007, and December 31, 2009, and zero otherwise. The financial crisis was accompanied by a contraction in bank lending to UK non-financial firms and therefore rapid growth in the cost

of bank loans. This situation encouraged firms to choose alternative methods to substitute for loans. Consistent with this argument, Vera et al. (2011) find that bond and equity issuances in the UK increased sharply during the financial crisis, despite elevated price volatility in the secondary market.

As discussed earlier, one of the reasons behind a firm's choice between equity and debt is that managers are concerned with the dilution of control arising from equity financing. However, Barnes and Walker (2006) find that ownership structure after a rights issue is relatively unaltered, while placing allows other investors to purchase new shares, resulting in diffused ownership. To consider this issue, following Armitage (2010), this study uses a dummy variable, rights, which takes the value of one if a firm use a rights offer or an open offer as their equity issue method and zero if it places or uses a combination of a placement and an open offer. In a rights-preserving offer, existing shareholders are entitled to preemptive rights to purchase new shares in proportion to their holdings. To maintain the control power of the firm, large shareholders are expected to pressure the firm into choosing rights-preserving offers instead of a placing (Cronqvist and Nilsson, 2003).

The credit rating of a firm is a dummy variable that takes the value of one if the firm's Standard & Poor's bond rating is above A- and zero if not. This variable is shown only in the regressions of bond issuance because it is only available for bond issuers from Thomson One Banker. As posited in pecking order theory, firms with higher ratings have fewer adverse selection problems, because credit ratings involve information revelation by the rating agency. Firms with higher reputations in the debt market may issue more corporate bonds (Denis and Mihov, 2003). Sufi (2009) further explores Standard & Poor's credit ratings as a new measure of information asymmetry.

To address the endogeneity of ownership variables, we use three determinants of ownership in our analysis: firm size, operational risk, and research and development (R&D) expenditure. Size is measured as the natural logarithm of a firm's market valuation. Given that purchasing a controlling share in a large firm is much more expensive than purchasing a controlling share

in a small firm, a large firm is expected to have dispersed ownership. Using US data, Bathala (1996) finds a negative relation between firm size and MSO. The variables for operational risk and R&D are used as measures of risk and uncertainty, respectively. Operational risk is calculated as the standard deviation of a firm's profitability over the previous four years, while R&D is defined as the ratio of R&D expenditure over total sales. One may expect firms taking high risks to be less likely to retain high levels of managerial ownership. Himmelberg et al. (1999) state that investment in R&D is a high-risk strategy, so risk-averse managers and controlling shareholders are unwilling to spend a great deal on R&D. Additionally, Mahrt-Smith (2005) argues that equity in firms with long-term investments is more likely to be dispersed, because of the lower share of cash flow rights.

3.4. Descriptive Statistics

Table 1 presents descriptive statistics of firm characteristics for the sample selected from 1998 to 2012, including MSO, institutional ownership, leverage, profitability, the market-to-book ratio, sales growth, tangibility, the dividend payout ratio, and the non-debt tax shield. The average MSO level is 9.05%, which is very close to the average level of 10.65% reported by Brailsford et al. (2002). The fact that the median MSO is considerably lower than the mean (4.60% versus 11.52%, respectively) indicates that firms with lower managerial ownership dominate the UK market and the distribution of MSO is fairly skewed. Panel B of Table 1 confirms this by showing that 53.81% of firm observations have low MSO (i.e., 0–5%). Institutional investors hold a significant proportion of total shares in UK firms, 32.63%, on average. We observe that the mean level of leverage is 26.64% in the sample of all UK firms. This ratio is significantly higher compared with the finding of Florackis and Ozkan (2009) for the period from 1999 to 2004. This can be interpreted as UK firms having higher leverage ratios due to increased junk bond sales.

(Please insert Table 1 here)

In Table 2, we match firm accounting data with security issues. The final dataset consists of 772 equity issues and 530 bond issues. Panel A shows the issuance frequency distribution by year. We note that equity issues are more frequent than bond issues. Equity and bond issues over the sample period raised £300.52 billion and £171.69 billion, respectively, in total. The average proceeds of equity issues were quite large during the financial crisis period, from 2007 to 2010, reaching a peak in 2008, at £873.50 million. The results also show a large increase in the number of equity issues by UK firms in 2009. These findings can be explained by the large number of firms that tried to reduce their leverage levels and strengthen their balance sheets by raising equity capital during the financial crisis. However, equity issues declined from 2010 to 2012 due to the surge in underwriting fees. Levis et al. (2011) argue that underwriters face high risk when market volatility is high levels and UK firms issued large equity issues to recapitalize their fragile balance sheets.

Panel B of Table 2 presents descriptive statistics by issue type and highlights the differences across equity and bond issues. The relative offer size of equity (Proceeds/MV)[8] is higher than that in bond issues. Equity issuers appear to have higher MSO and institutional ownership than bond issuers. The differences are all statistically significant. These results suggest that firms that have higher MSO or institutional ownership rely more on equity than on bond financing, consistent with the argument of risk aversion and managerial entrenchment theory. The market value of bond issuers, on average, is much greater than that of equity issues, suggesting that bond issues tend to cluster in large firms.

The profitability of equity issuers is greater than that for bond issuers (16.76% versus 16.36%, respectively). On average, the difference in the sales growth ratio between equity and bond issuers is 7.61% and statistically significant. This indicates that equity issues tend to cluster in high-growth firms, consistent with the findings of Frank and Goyal (2009). Nevertheless, the average market-to-book ratio, dividend, and non-debt tax shield are much higher for bond issuers than for equity issuers (3.97% versus 3.21%, 39.71% versus 28.42%, and 3.16% versus

[8] Proceed/MV denotes the ratio of issue proceeds over market valuation.

2.41%, respectively). Regarding whether equity and bond issues are associated with different market valuations, our results indicate that equity issues are more likely to cluster in a favorable market.

(Please insert Table 2 here)

4. Empirical Results

We apply several ordinary least squares (OLS) models to explore the hypotheses developed. The first model is a regression to examine how ownership structure impacts firm leverage. The second model examines how various levels of MSO affect firm equity–bond choices. In this regression, the external financing choice includes not only the likelihood of issuing equity or bonds but also the amount of security issue proceeds. The third model tests whether the effect of MSO on external financing policy changes under different stock market valuations.

4.1. Ownership and Capital Structure

Table 3 presents the results of the first model, where leverage is regressed against ownership measures and other firm characteristics, using the overall sample of UK firm–year observations. We use two different definitions of leverage to determine the robustness of our results: book and market leverage. Our analysis also includes industry and year dummies to control for industry- and time-specific effects, respectively.

In Model 1, the coefficient of MSO (low value) for the market leverage ratio is positive and significant at the 1% level, whereas the coefficient of MSO squared (high value) is negative and significant. This result confirms a non-monotonic relation between leverage and MSO. MSO is negatively associated with high debt ratios and positively associated with lower debt ratios. Specifically, firms tend to align the interests of managers and shareholders at lower MSO levels by choosing a higher level of debt. However, when MSO is high, more entrenched corporate managers are likely to pursue their own self-interests, resulting in a lower debt ratio. This finding is consistent with the studies of Brailsford et al. (2002) and Florackis and Ozkan (2009).

By simple differentiation, we find the turning point of this relation to be around 13%, in the median MSO range. That is, the positive relation between ownership and leverage holds up to only 13%. The robustness test for book leverage in Model 3 shows consistent results, with a turning point around 15%.

To confirm the results in Models 1 and 3, MSO is replaced by three piecewise variables, as in Models 2 and 4 (Morck et al., 1988). Consistent with earlier findings, we observe a positive and significant relation between MSO and leverage when MSO is below 25%. This association becomes negative when MSO is above 25%. Since the distribution of MSO is skewed to the right (see Table 1), the positive relation between MSO and leverage dominates our UK sample. Put differently, the piecewise linear regression result provides strong empirical evidence that supports interest alignment theory. It implies that only a small proportion of UK managers with considerably high ownership are entrenched and apt to lower debt levels in their own interests.

We also examine the effect of institutional ownership on firm debt levels. As shown in all the models, the coefficients of the institutional variable are positive and statistically significant. This suggests that firms with higher institutional ownership are prone to hold more debt in their capital structure. Consistent with the argument of Bhojraj and Sengupta (2003), concentrated institutional ownership effectively lowers the cost of debt capital through strong external monitoring. Further, the majority of UK institutional investors are financial firms. Their ready access to finance helps lower the cost of debt as well. Tufano (1996) provides another potential explanation: Most institutional shareholders invest in a variety of firms to diversify risk. They may thus be interested only in a firm's short-term performance. Hence, to attract outside institutions, firms may raise capital via debt financing to adopt investment strategies that meet institutional investors' requirements.

With regard to other important firm characteristics, the results in Table 3 further demonstrate that firms with more tangible assets are more likely to raise debt in their capital structure, consistent with the findings of Friend and Lang (1988) and Jensen et al. (1992). The regression results indicate that profitable firms are more likely to increase their debt levels, consistent with

our prediction. Moreover, as a proxy for firm growth opportunities, sales growth also negatively affects firm debt levels. A survey investigating trade-off theory finds that firm growth increases the cost of financial distress, diminishes the free cash flow problem, and exacerbates the agency cost of debt (Frank and Goyal, 2009). Hence firms with more growth opportunities are less likely to raise debt.

We also discover that the coefficient of the non-debt tax shield is positive and significant at the 10% level, which is in line with the argument of Moh'd et al. (1995). These authors regard depreciation as the primary component of the non-debt tax shield and posit that higher depreciation charges represent a higher level of tangibility, which implies a higher collateral value for the firm; thus the capacity for debt rises. Another important finding is that the coefficient of Crisis is positive and significant, suggesting that UK firm debt levels were higher during the financial crisis period compared with other periods.

(Please insert Table 3 here)

4.2. Ownership, Market Valuation, and Financing Decisions

Thus far, we have shown that the ownership structure of UK firms is non-monotonically related to capital structure. We now examine the effect of ownership on the external financing activity of firms in terms of two aspects: issue type and offer size. Plainly, issuing public debt increases firm debt levels, while issuing equity decreases leverage ratios. Furthermore, a larger security issuance offer strengthens such effects. However, it is unclear from the literature whether and to what degree the external financing decisions of firms are affected by their ownership structure. Therefore, our analysis aims to establish a link between ownership structure and the external financing decisions of firms. Tables 4 and 5 present the results of regressing ownership on issue choice and offer size for 1,202 issues, a combination of 772 bond and 530 equity issues from 1998 to 2012.

In Table 4, we use a binary dependent variable that takes the value of one for equity issues and zero for bond issues. In addition to the two ownership structure measures, our models also

include the determinants of bond–equity choice considered important in earlier empirical work (Frank and Goyal, 2007, 2009; Morck et al., 1988).

First, as shown in Table 4, the coefficient of MSO is positive and significant at the 1% level. This finding suggests that an increase in MSO is associated with a higher likelihood of issuing equity over debt. Combined with the results in Table 3, we can summarize that firms with low levels of MSO are prone to issue bonds instead of equity, leading to increased leverage. Nevertheless, firms with higher MSO tend to choose equity financing over bonds, resulting in reduced leverage. This empirical result also supports the interest alignment hypothesis of Jensen and Meckling (1976) and managerial entrenchment theory (Jensen, 1986). In addition, Table 5 shows that the equity issue offer size is negatively related to the level of MSO. This result supports the control hypothesis, that controlling shareholders are more likely to decrease the size of equity issue to maintain their control. We also find that high-MSO firms are more likely to reduce their bond size, supporting managerial risk aversion (Friend and Lang, 1988) and managerial entrenchment theory (Jensen, 1986).

Second, Table 4 also shows that firms with concentrated institutional ownership are less likely to issue bonds over equity across three estimations, which is contrary to our hypothesis. However, Table 5 reports that institutional ownership has a significant and positive effect on bond proceeds. This suggests that firms with high institutional ownership tend to maximize their offer size if they issue bonds to finance. One explanation may be that higher institutional ownership leads to lower bond yields and higher ratings on new bond issues (Bhojraj and Sengupta, 2003). Thus the proceeds of new bonds are likely to be maximized. The results also explain the positive relation between institutional OC and leverage. That is, firm with high institutional holdings will maximize bond size, even if they choose to issue equity over bonds. Another possible explanation is that firms with institutional holdings prefer other types of debt financing besides bonds, such as private debt and bank loans, as confirmed by subsequent empirical results.

Third, Model 1 in Table 4 further shows that the coefficient of the current market is positive and significant at the 1% level. This suggests that favorable market conditions increase the probability of equity issues, while an unfavorable market increases the probability of bond issues. This finding supports the previous literature (Allen and Faulhaber, 1989; Bayless and Chaplinsky, 1996), which states that firms prefer raise equity capital under favorable current market conditions. Allen and Faulhaber (1989) argue that a hot market is a sign of a positive shock to a firm's expected profits. Bayless and Chaplinsky (1996) demonstrate that a hot market offers a window of opportunity for seasoned equity issues because the asymmetric information and adverse selection costs should be lower then.

To investigate the specific role of current market valuation on the relation between ownership and the external funding decisions of firms, we construct two binary variables, Hot and Cold, representing hot and cold stock market periods, respectively. Then we develop two interaction terms between MSO and stock market valuation in the regressions: MSO*Hot and MSO*Cold. As reported in Model 1 of Table 4, the results of the effect of MSO and the current market on financing decisions are consistent with earlier findings. The coefficient of the interaction term MSO*Hot is positive and statistically significant, implying that a hot market increases the probability of high-MSO firms choosing equity over bond issues. The results of Model 3 show that the interaction variable MSO*Cold is negative and significant at the 1% level, which indicates that a cold market weakens the likelihood of a high-MSO firm issuing equity over bonds. These empirical results strongly support market timing theory. However, they also show market valuation has no impact on the relation between institutional OC and financial decisions.

Fourth, other controlling variables in Table 4 also have a significant impact on a firm's external financing choices. The result suggests that greater tangibility increases the probability of firms choosing bonds over equity, supporting the findings of Friend and Lang (1988) and Jensen et al. (1992). The positive coefficient of profitability indicates that firms with higher retained earnings are more likely to issue equity than bonds. At the same time, firms with higher growth opportunities, measured by sales growth, also tend to issue equity over bonds. However, the

dividend coefficient suggests that firms with higher cash dividend payments have more incentives to issue bonds over equity, consistent with pecking order theory. Additionally, the coefficient of the non-debt tax shield indicates that firms with higher depreciation charges tend to raise equity capital over public debt, supporting the argument of DeAngelo and Masulis (1980). Finally, the financial crisis is found to have increased the probability of choosing equity over bonds. This implies that equity financing is more favorable for firms in financial distress than bond issues are.

Fifth, we further examine the effect of other determinants on offer size in Table 5. The level of debt is positively related to the size of equity issues because firms tend to decrease leverage by larger amounts of equity. These results show that high-tangibility firms tend to increase the proceeds of bond issues relative to the proceeds of equity offerings. This implies that firms with higher levels of tangible assets are expected to have a lower cost of debt because they have more collateral to offer. The market-to-book ratio, sales growth, and dividend have a positive effect on the proceeds of equity, which implies that managers tend to time the stock market to issue equity. Moreover, it is found that firms are more likely to increase the size of equity issue and raise fewer bonds when the market is favorable, in line with market timing theory. The results also reveal that rights-preserving offers are larger than non–rights-preserving issues. Finally, credit rating, a significant determinant of bond size, has a significantly positive effect, consistent with the findings of Denis and Mihov (2003).

(Please insert Tables 4 and 5 here)

Our previous empirical analysis explores the impact of ownership on capital structure and financing decisions. However, some studies argue that ownership is an endogenous variable and thereby ownership may not affect firm debt levels but can be influenced by them (e.g., Demsetz, 1983; Jensen and Meckling, 1976). To address this issue, we use a two-stage least squares (2SLS) model to further examine whether different levels of debt prompt shareholders to adjust their holdings and whether the choice of external financing leads to changes in ownership.

Following previous studies related to ownership, we use firm size, operational risk, and R&D as instrumental variables of ownership. All instruments are tested for the endogeneity/validity of 2SLS (partial F-test, Hausman–Wu test) and over-identification (Sargan statistic), as recommended by Larcker and Rusticus (2010). Our results confirm that the three chosen instruments are appropriate for our models. In both Tables 6 and 7, the results from Model 1 are consistent with the OLS results in Table 3 and. Model 2 suggests that a high leverage reduces managerial ownership. This result confirms the argument that managers are unwilling to invest too much of their personal wealth in a firm with high levels of debt because of the increased non-diversifiable risk of bankruptcy to the managers themselves. The finding in Model 3 also indicates that institutions are likely to invest in firms with less debt. As shown in Table 7, the coefficient of the equity variable is insignificant, implying that equity issuance has no impact on MSO or institutional OC.

Among the exogenous ownership variables, the results show that size is negatively linked to MSO and institutional OC. This finding implies that larger firms are more likely to have a lower level of MSO or institutional OC, consistent with the study of Bathala (1996). Operational risk plays a negative role, indicating that shareholders are more likely to decrease holdings when market volatility is high. Moreover, the coefficient of the R&D variable has a negative sign. This is also consistent with the argument of Mahrt-Smith (2005), that is, a firm making a long-term investment decreases the share of cash flow rights, associated with lower MSO or institutional OC.

(Please insert Tables 6 and 7 here)

The earlier research focuses on the choice between equity and public issues of straight debt, that is, bonds. Within the class of debt financing, however, firms also use private debt, for example, bank loans and revolving credit facilities. To address this type of debt financing, we use the net debt issue to categorize whether a firm issues debt. Similar to Hovakimian et al. (2001), we define firms that issue debt as those whose net debt issue exceeds 5%. Here, net debt issue is calculated as long-term debt issuance minus long-term debt reduction plus changes in current debt divided by total assets (Baker and Wurgler, 2002). As such, the net

debt issue comprises both public debt and private debt. Similarly, firms are defined as issuing equity when net equity issue[9] is over 5%. After excluding issuers who issue both equity and debt in a given year, we have 2,515 issues classified from 4,137 yearly firm observations, including 768 net equity issues and 1,747 net debt issues.

By using different definitions of debt and equity issue, we conduct robustness tests to examine the impact of ownership on the choice between equity and debt and on the amount of issuance. Table 8 reveals interesting findings: Firms with high institutional holding are more likely to issue debt over equity and they tend to increase the amount of debt. These results are consistent with the findings in Table 3, that institutional OC is positively related to debt. However, Table 4 shows that an increase in institutional OC is associated with a higher probability of issuing equity over bonds. The combined results of Tables 4 and 8 imply that firms with larger institutional holdings prefer private debt to equity. By contrast, public bonds are the last choice for these firms. This is consistent within the context where some institutional shareholders are banks that could force firms to borrow from them (Rajan and Zingales, 1995).

(Please insert Tables 8 here)

As we found earlier, high-MSO firms are less likely to choose a bond issue over equity because of the increased default risk. Such firms are more likely to decrease the size of their equity issue. This finding is explained by the controlling shareholders' concerns about maintaining control. However, not all of the equity issued dilutes control. To address this issue and enhance our argument, we further highlight the distinction between rights- and non–rights-preserving methods of raising equity capital.

In Table 9, we construct a dummy variable, Rights-preserving, for our analysis that takes the value of one for a rights or open offer and zero for a placing or a combination of a placing and an open offer. We further examine whether ownership can influence the choice between rights- and non–rights-preserving methods of equity issuance and whether ownership has an impact on

[9] The definition of net equity issue is provided in the Appendix.

the choice between rights-preserving equity and bond issues. The results show that, since firms with high MSO and high institutional OC have to raise money through external financing, a rights-preserving equity issue will be their first choice, a non–rights-preserving issue is next, and a bond issue last. This implies that controlling shareholders are more concerned about the increased bankruptcy risk brought about by the bonds than the loss of control through the equity issue. These results are consistent with the earlier finding in Table 5. We also find that, of the three financing methods, firms are most likely to choose the rights-preserving issue, since they need to raise more capital.

(Please insert Tables 9 here)

5. Conclusions

This study extends our knowledge of capital structure in the following ways. First, it stresses the importance of the relation between ownership and leverage ratio in the UK context. Our analysis uses two major proxies for ownership: MSO and institutional ownership. Our empirical results show a non-monotonic relation between MSO and the debt ratio. At lower MSO levels, the relation with leverage is positive, supporting interest alignment theory (Jensen and Meckling, 1976). This is because higher managerial ownership plays an important role in aligning the interests of corporate managers and shareholders, leading to lower costs of debt. In this case, firms are likely to raise more debt, resulting in higher debt. However, this relation becomes negative for a small proportion of higher-MSO firms, which can be explained by the managerial entrenchment hypothesis (Fama and Jensen, 1983). Corporate managers who own high percentages of firm shares are in a better position to protect their private interests from the risk of bankruptcy associated with a high leverage ratio. Our finding is consistent with the studies of Brailsford et al. (2002) and Florackis and Ozkan (2009).

Interestingly, we find that institutional ownership has a homogeneously positive effect on firm leverage ratios, although a high degree of institutional ownership decreases the probability of issuing bonds over equity. Our results provide two explanations: First, high institutional OC

firms have an incentive to issue more bonds and less equity. Second, such firms are more likely to turn to other types of debt as financing channels.

Second, we further examine the impact of ownership structure on the external financing decisions of firms. Our empirical results strongly suggest that higher-MSO firms prefer to issue equity to bonds to avoid the risk of bankruptcy and maintain their corporate control. We also consider the role of current market valuation in the choice of security issuances. Consistent with previous findings (Allen and Faulhaber, 1989; Bayless and Chaplinsky, 1996), firms raise new seasoned equity when the market is favorable; otherwise, they are more likely to choose a bond issue. Further, we tie stock market valuations to the relation between MSO and a firm's external financing activities. We find that a hot market increases the probability of firms with greater managerial ownership choosing equity over bond issues. At the same time, a cold market decreases the probability that firms with greater MSO issue equity over bonds. In summary, the empirical evidence confirms such intuition, that firms, on average, time current market valuations when they plan to raise external financing.

Third, this study also addresses the role of the financial crisis in the external financing decisions of firms. We find UK firms chose equity over bonds during the financial crisis, providing strong evidence for the market timing theory and the risk aversion hypothesis.

We note that our research highlights MSO and institutional ownership as proxies of ownership structure. Due to the difficulty of obtaining reliable data, we do not take into account institutional shareholder types, although they play a vital role in ownership structure. For the same reasons, it is unclear how institutional differences affect firm capital structure decisions.

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Table 1. Descriptive Statistics of the Full Sample

This table reports key descriptive statistics of the sample of 383 UK listed companies, Panel A providing firm observations for different levels of MSO and Panel B providing firm observations for different periods, excluding financials and utilities. All firm observations are yearly, based on the period from January 1, 1998, to December 31, 2012. Panel A reveals the means, standard deviations, medians, and 25th and 75th percentiles of firm characteristics for the full sample. In Panel B, MSO is categorized as low, under 5%; medium, 5–25%; and high, over 25%.

Panel A: Descriptive statistics of the 383 sample firms

Variables	Mean	St. Dev.	25th Percentile	Median	75th Percentile	No. of Obs.
MSO (%)	9.046	11.519	3.500	4.600	8.330	4138
Institutional OC (%)	32.634	19.613	17.610	31.530	46.400	4137
Leverage (Market) (%)	26.639	21.211	8.320	23.100	42.180	4138
Leverage (Book) (%)	29.174	32.189	6.193	19.523	52.799	4138
Tangibility (%)	53.175	26.188	32.500	49.179	77.992	4138
Profitability (%)	33.688	53.349	9.501	20.009	60.167	4138
M/B ratio (%)	2.279	2.341	0.890	1.470	2.730	4138
Sales growth (%)	13.276	36.740	-1.141	7.990	20.337	4138
Dividend (%)	37.986	31.916	0.021	36.610	60.950	4138
Non-debt tax shield (%)	2.155	2.746	0.001	1.349	3.404	4137
MV (£, millions)	1246.120	2072.100	168.970	406.270	1251.690	4138
Operational risk (%)	0.043	0.078	0.008	0.021	0.048	4138
R&D (%)	3.149	6.582	0.000	0.580	3.770	4138

Panel B: Firm observations with different MSO levels

	Low MSO (0–5%)		Medium MSO (5–25%)		High MSO (>25%)	
Variables	**Mean**	**St. Dev.**	**Mean**	**St. Dev.**	**Mean**	**St. Dev.**
MSO (%)	3.695	0.516	7.955	2.394	32.999	16.201
Institutional OC (%)	33.614	19.455	35.717	19.618	21.656	16.255
Leverage (Market)(%)	26.708	20.911	28.306	21.975	22.559	20.096
Leverage (Book)(%)	24.486	32.111	40.539	35.000	21.157	26.071
Tangibility (%)	57.912	27.896	45.860	22.428	50.857	22.735
Profitability (%)	40.507	54.551	24.711	44.114	26.818	63.029
M/B ratio (%)	1.946	2.015	2.571	2.543	2.949	2.806
Sales growth (%)	11.666	37.627	14.943	34.346	15.931	38.141
Dividend (%)	41.074	34.829	33.973	26.808	34.757	29.002
Non-debt tax shield (%)	1.704	2.380	2.763	3.056	2.559	3.017
MV (£, millions)	1582.630	2407.810	928.893	1609.610	620.051	1038.850
Operational risk (%)	0.034	0.053	0.048	0.094	0.065	0.110
R&D (%)	2.634	5.701	3.419	7.619	4.806	6.917
N	2226		1329		582	
%	53.807		32.125		14.068	

Table 2. Distributions and Firm Characteristics of Bond and Equity Issues

Panel A presents the distributions of 772 equity issues and 530 bond issues by year. Panel B presents the firm characteristics for the samples of equity and bond issues respectively, excluding financials and utilities. All issues are from January 1, 1998, to December 31, 2012. Here Annual Proceeds is the sum of proceeds in one year and Average Proceeds is the average of proceeds in one year. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively, for the *t*-test of the difference in means between equity and bond issues.

Panel A: Equity and bond issue distributions

	Equity Issue			Bond Issue		
Year	**N**	**Annual Proceeds**	**Average Proceeds**	**N**	**Annual Proceeds**	**Average Proceeds**
1998	20	2679.400	133.970	7	3665.160	523.594
1999	24	3245.16	135.215	31	23455.13	756.617
2000	56	19697.350	351.738	40	30183.920	754.598
2001	69	23292.910	346.810	37	8048.050	217.515
2002	51	14800.270	290.201	47	14227.410	302.711
2003	60	12355.530	205.925	48	19268.350	401.424
2004	52	10073.300	193.717	27	5685.270	210.566
2005	53	7146.930	134.848	18	4436.650	246.481
2006	36	4068.060	113.002	61	12195.110	199.920
2007	53	37485.571	707.278	54	15941.150	295.206
2008	28	24597.980	878.499	41	11916.080	290.636
2009	177	107234.360	605.844	37	9277.350	250.739
2010	45	25790.070	573.113	27	3305.320	122.419
2011	29	3243.210	111.835	31	5185.830	167.285
2012	19	4806.850	252.992	24	4902.990	204.291
Total	772	300,516.951		530	171,693.770	

Panel B: Firm characteristics for bond and equity issues

	Equity Issues (N = 772)		Bond Issues (N = 530)		Difference in Means
Variables	**Mean**	**Std. Dev**	**Mean**	**Std. Dev**	
Proceeds (£, millions)	318.108	396.088	365.076	410.168	-46.968[a]
Proceeds/MV (%)	0.364	0.676	0.073	0.175	0.291[a]
MSO (%)	9.101	10.783	5.946	6.237	3.155[a]
Institutional OC (%)	35.323	25.309	28.38	25.712	6.943[a]
Leverage (Market) (%)	38.562	25.576	38.693	20.342	-0.131[a]
Tangibility (%)	36.560	24.431	40.421	19.936	-3.862[a]
Profitability (%)	16.756	60.946	16.358	15.706	0.398[a]
M/B ratio (%)	3.205	5.037	3.974	9.062	-0.769[a]
Sales growth (%)	20.248	41.192	12.639	24.757	7.609[a]
Dividend (%)	28.425	28.907	39.711	25.759	-11.346[a]
Non-debt tax shield (%)	2.509	2.897	3.155	2.075	-0.646[a]
Current market (%)	4.162	0.556	3.957	0.510	0.205[a]
Crisis	0.392		0.300		
Rights-preserving	0.171				
Credit rating			0.365		
MV (£, millions)	1998.530	2418.350	3446.62	3163.970	-1448.090[a]
Operational risk (%)	6.447	10.323	4.194	4.380	2.250[a]
R&D (%)	3.440	8.205	1.931	3.855	1.509[a]

Table 3. Impact of Ownership Structure on Firm Capital Structure

This table reports the estimates of several OLS regressions of firm leverage levels on ownership measures and a series of control variables over the period from January 1, 1998, to December 31, 2012. Models 2 and 4 are piecewise linear specifications in MSO such that (1) MSO (0–5%) is equal to MSO when MSO is lower than 5% and it is equal to 5% otherwise; (2) MSO (5–25%) is equal to zero if MSO is lower than 5% and, when MSO is in the range 5–25%, MSO (5–25%) is equal to MSO minus 5%; otherwise, MSO (5–25%) is equal to 25%; and (3) MSO (>25%) is equal to zero if MSO is lower than 25%; when MSO is over 25%, MSO (>25%) is equal to MSO minus 25%. All independent variables are lagged with respect to the dependent variable. All regressions include year and industry fixed effects. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variables	**Leverage (Market)**		**Leverage (Book)**	
	Model 1	**Model 2**	**Model 3**	**Model 4**
Intercept	6.311[a]	6.146[a]	3.615[a]	3.127[a]
MSO	7.223[b]		1.621[a]	
MSO^2	-0.277[a]		-0.051[a]	
MSO (0–5%)		3.798[a]		3.685[a]
MSO (5–25%)		-2.918[a]		-5.516[a]
MSO (>25%)		-3.186[a]		-3.202[a]
Institutional OC	0.222[b]	0.040[a]	0.207[b]	0.197[a]
Tangibility	0.598[a]	0.590[a]	0.341[a]	0.363[a]
Profitability	0.298[a]	0.303[a]	0.212[a]	0.123[a]
M/B ratio	-0.160	-0.152	-0.154	-0.127
Sales growth	-0.082[b]	-0.086[b]	-0.625[a]	-0.616[a]
Dividend	0.036	-0.026	-0.038[c]	-0.036[c]
Non-debt tax shield	0.436[b]	0.420[a]	0.305[b]	0.307[a]
Crisis	1.040[b]	0.968[a]	1.184[b]	1.334[a]
Adjusted R^2	0.493	0.490	0.190	0.190
N	4137	4137	4137	4137

Table 4. Impact of Ownership Structure on the Financing Decisions of Firms

This table reports the estimates of logistic regressions where the dependent variable is binary variable that takes on the value of one if the issuer issues equity and zero for bond issues. The sample comprises 1,202 issues—772equity and 530 bond issues—from January 1, 1998, to December 31, 2012. All independent variables are for the year-end prior to issuance. All regressions include year and industry fixed effects. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Model 1	**Model 2**	**Model 3**
Intercept	-6.416[a]	-3.511[a]	-2.532[a]
MSO	1.366[a]	1.320[a]	1.154[a]
MSO*Hot		0.153[a]	
MSO*Cold			-0.951[b]
Institutional OC	0.636[a]	0.378[a]	0.663[a]
Institutional OC*Hot		o.338	
Institutional OC*Cold			-0.205
Hot		0.504[a]	
Cold			-2.559[a]
Current market	0.829[a]		
Proceeds/MV	0.158	0.182	0.160
Leverage (Market)	-0.287	-0.161	-0.169
Tangibility	-0.080[c]	-0.818[a]	-0.072
Profitability	0.032[b]	0.068[a]	0.029[b]
M/B ratio	-0.068	-0.083	-0.013
Sales growth	0.050[b]	0.052[b]	0.051[b]
Dividend	-0.098[a]	-0.102[a]	-0.104[a]
Non-debt tax shield	-0.128[a]	-0.129[a]	-0.136[a]
Crisis	0.256[a]	0.363[a]	0.137[a]
Adjusted R^2	0.264	0.264	0.264
N	1202	1202	1202

Table 5. Impact of Ownership on the Amount of Issuance Proceeds

This table reports the estimates of several OLS regressions where the dependent variable is the amount of proceeds issued (scaled by the issuer's market value for the year-end prior to issuance). The sample comprises 1,202 issues—772 equity and 530 bond issues—over the period from January 1, 1998, to December 31, 2012. Model 1 examines the relation between ownership and the amount of equity issue proceeds, while Model 2 tests the impact of ownership on the amount of bond issue proceeds. All regressions include year and industry fixed effects. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	**Equity Issue Proceeds**	**Bond Issue Proceeds**
	Model 1	**Model 2**
Intercept	1.330	1.446[a]
MSO	-0.191[a]	-0.108[c]
Institutional OC	-0.157[a]	0.163[b]
Leverage	0.309[b]	0.388
Tangibility	-0.381	0.584[a]
Profitability	-0.097	0.311
M/B ratio	1.298[b]	0.736[b]
Sales growth	0.179[a]	1.526
Dividend	0.314[b]	-0.499
Non-debt tax shield	-0.157	0.816
Current market	1.637[a]	-0.555[b]
Rights	0.273[a]	
Credit rating		2.093[b]
Crisis	0.938	1.337
Adjusted R^2	0.142	0.132
N	772	530

Table 6. Simultaneous Equation Results for Ownership Structure and Capital Structure

This table presents the results of a simultaneous panel of equations for ownership and firm capital structure using 2SLS regression. The sample contains 383 UK listed firms from January 1, 1998, to December 31, 2012. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	**Leverage (Market)**	**MSO**	**Institutional OC**
	Model 1	**Model 2**	**Model 3**
Intercept	6.628[a]	5.157[a]	-5.085[c]
Leverage		-0.076[a]	0.047[b]
MSO	5.735[a]		
MSO^2	-0.218[c]		
Institutional OC	0.417[b]		
Tangibility	0.779[a]		
Profitability	0.247[a]		
M/B ratio	-0.017		
Sales growth	-0.044[b]		
Dividend	0.057[a]		
Non-debt tax shield	0.814[a]		
Crisis	2.343[a]		
Size		-0.271[a]	0.204[b]
Operational risk		-0.265[b]	-0.089[b]
R&D		-0.112[c]	-0.017[a]
Adjusted R^2	0.546	0.277	0.173
N	4137	4137	4137

Table 7. Simultaneous Equation Results or Ownership Structure and Financial Decisions

This table presents the results of a simultaneous panel of equations for ownership and firm financial decisions using 2SLS regression. The sample comprises 1,202 issues—772equity and 530 bond issues—from January 1, 1998, to December 31, 2012. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	Equity	MSO	Institutional OC
	Model 1	Model 2	Model 3
Intercept	-0.687[a]	2.760[a]	7.101[a]
Equity		0.084	-0.030
MSO	0.214[a]		
Institutional OC	0.130[a]		
Current Market	0.632[a]		
Proceeds/MV	-0.010		
Leverage (Market)	-0.059		
Tangibility	-0.127[b]		
Profitability	0.060[b]		
M/B ratio	-0.015		
Sales growth	0.090[b]		
Dividend	-0.212[a]		
Non-debt tax shield	-0.239[a]		
Crisis	0.540[a]		
Size		-0.764[a]	-0.257[a]
Operational risk		-0.415[a]	-1.576[a]
R&D		-0.165	-0.303
Adjusted R^2	0.200	0.139	0.266
N	1202	1202	1202

Table 8. Impact of Ownership on the Choice between Equity and Debt and on the Amount of Issuance

This table reports the impact of ownership on the choice of between equity and debt and on the amount of issuance. According to Baker and Wurgler (2002) and Hovakimian et al. (2001), the dependent variables in Model 1 are binary variables that take on the value of one when the net equity issue exceeds 5% and zero as the net debt issue exceeds 5%. Cases where firms issue both equity and debts in a given fiscal year are omitted. The dependent variables in Model 2 are the amounts of net equity issue. The dependent variable in Model 3 is the amounts of net debt issue. The sample comprises 2,515 issues with 768 net equity issues and 1,747 net debt issues from 1998 to 2012. All independent variables are for the year-end prior to issuance. All regressions include year and industry fixed effects. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	**Equity vs. Debt**	**Net Equity Issue**	**Net Debt Issue**
	Model 1	**Model 2**	**Model 3**
Intercept	2.933[a]	2.007[a]	5.124[b]
MSO	0.225[a]	-0.418[b]	-0.197[c]
Institutional OC	-0.141[c]	-1.267[a]	0.440[b]
Leverage (Market)	0.192[a]	-0.963	-1.157
Tangibility	-0.141[a]	-0.874[a]	1.011[a]
Profitability	0.026[b]	-0.284[a]	0.030
M/B ratio	0.295	0.040	-0.234
Sales growth	0.091[a]	0.261[a]	0.064
Dividend	-0.037[a]	0.270[b]	-0.238[a]
Non-debt tax shield	-0.345	-0.184	-0 159
Crisis	0.175[c]	0.393	0.151
Adjusted R^2	0.092	0.066	0.026
N	2515	768	1747

Table 9. Impact of Ownership on Financing Decisions between a Rights Issue, a Non–Rights-Preserving Issue, and a Bond Issue

This table reports the impact of ownership on the choice of alternative external financing, including a rights-preserving issue, a non–rights-preserving issue, and a bond issue. The dependent variable in Model 1 is a binary variable that takes on the value of one if the issuer chooses a rights-preserving equity issue and zero for a non–rights-preserving issue. The dependent variable in Model 2 is a binary variable that takes on the value of one if the issuer chooses a non–rights-preserving equity issue and zero for bond issues. The dependent variable in Model 3 is a binary variable that takes on the value of one if the issuer chooses a rights-preserving equity issue and zero for a bond issue. The sample comprises 772 equity issues, with 132 rights-preserving issues, 630 non–rights preserving issues, and 530 bond issues from January 1, 1998, to December 31, 2012. All independent variables are for the year-end prior to issuance. All regressions include year and industry fixed effects. The superscripts a, b, and c denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	Rights vs. Non-Rights	Non-Rights vs. Bonds	Rights vs. Bonds
	Model 1	Model 2	Model 3
Intercept	-2.549[a]	-1.966[a]	-6.218[a]
MSO	0.151[c]	0.722[a]	0.453[a]
Institutional OC	0.096[b]	0.197[a]	0.267[a]
Proceeds/MV	0.392[a]	0.838[a]	1.112[a]
Tangibility	0.109[c]	−0.140[a]	−0.051
Leverage (Market)	0.183[a]	-0.074	0.193[b]
Profitability	-0.015	0.045[a]	0.047
M/B ratio	-0.339	0.026	-0.211
Sales growth	-0.089	0.059[a]	0.051
Dividend	-0.202	-0.135[a]	-0.191[a]
Non-debt tax shield	0.208	-0.127[a]	-0.878[c]
Current market	-0.136	0.639[a]	0.876[a]
Crisis	0.628[b]	-0.117	0.800[b]
Adjusted R^2	0.097	0.367	0.363
N	772	1170	662

Appendix: Variables Definitions

	Definition	Source
Issuer characteristics		
Proceeds	Gross proceeds. If missing, the data are constructed from the number of new shares times the offer price.	Thomson One Banker
Proceeds/MV	Ratio of proceeds over market valuation.	Thomson One Banker
Rights-preserving	Dummy variable that takes the value of one for a rights-preserving equity issue, including a rights offer and an open offer, and zero otherwise.	Thomson One Banker
Credit rating	Dummy variable that takes the value of one for a firm whose Standard & Poor's bond rating is above or equal to A- and zero if below.	Thomson One Banker
Ownership characteristics		
MSO	MSO, defined as the sum of the ownership of executive and non-executive directors.	Thomson One Banker
Institutional OC	Aggregate blocks of at least 3% of the firm's share stakes held by all institutional investors.	Thomson One Banker
Firm characteristics		
Leverage (Book)	Ratio of the book value of total debt to total assets.	Datastream
Leverage (Market)	Ratio of total debt to the sum of book debt and the market value of equity.	Datastream
MV	Market value of the issuer.	Datastream
Tangibility	Ratio of property, plant, and equipment over total assets.	Datastream
Profitability	Ratio of earnings before interest, taxes, depreciation, and amortization over total assets.	Datastream
M/B ratio	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 assets.	Datastream
Sales growth	Change in the logarithm of total assets.	Datastream
Dividend	Common dividend payout ratio.	Datastream
Non-debt tax shield	Ratio of depreciation to total assets.	Datastream
Net equity issue	The change in book equity minus the change in balance sheet retained earnings divided by total assets.	Datastream
Net debt issue	The long-term debt issuance minus long-term debt reduction plus changes in current debt divided by total assets.	Datastream
Market characteristics		
Current market	Measured as the three-month moving average of scaled equity issue volumes, where the scaled issue volume is the aggregate equity issue volume divided by the month-end value of outstanding equity for the London Stock Exchange.	Thomson One Banker
Hot	Dummy variable that takes the value of one when the valuation of the current market is in the top 30% of the whole research period and zero otherwise.	Thomson One Banker
Cold	Dummy variable that takes the value of one when the valuation of the current market is in the bottom 30% of the whole research period and zero otherwise.	Thomson One Banker
Crisis	Dummy variable that takes the value of one when the issuance occurs between January 1, 2007, and December 31, 2009, and zero otherwise.	Thomson One Banker
Determinants of ownership		

Size	MV, as a natural logarithm.	Datastream
Operational risk	Standard deviation of a firm's profitability over the four previous years.	Datastream
R&D	Ratio of R&D expenditure over total sales.	Datastream