Capital Structure and Market Timing in the UK: Deviation from Target Leverage and Security Issue Choice.

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Abstract

We test the market timing theory for UK firms and its impact of capital structure by estimating intrinsic value of equity. Managers increase debt issues during periods of undervaluation and depress leverage levels when equities are overvalued and leads them the deviate from target levels. We further find that equity mispricing influences issue decisions as well as the issue choice. Equity mispricing increases the likelihood of firms making security issues. In addition, undervaluation increases the probability of firms opting for debt issues instead of equity. Firms also reduce equity and debt levels to reflect equity mispricing indicating that repurchase decisions are also timed. In addition, we find that firms issue make debt issues accompanied by equity repurchases during periods of undervaluation and vice versa.

Keywords: Market timing, equity mispricing, target leverage, repurchasing, UK firms, capital structure.

1. Introduction

We study the market timing behaviour by looking at equity mispricing in the UK. The market timing theory of capital structure posits that firms would issue debt during periods of undervaluation and equity during periods of overvaluation. If managers do adjust security issues accordingly, they would retire debt and repurchase shares based on equity mispricing as well. Thus managers would be able to exploit equity mispricing to deliver value to the firms by changing the financing mix.

In this study, we examine the target leverage and the determinants of deviation from target leverage. Thus, we firstly examine how equity mispricing influences leverage levels. If firms increase (decrease) debt levels during periods of undervaluation (overvaluation), we conjecture that firms would be over-levered (under-levered). Secondly we scrutinize whether firms are more likely to issue (or remain passive) in the presence of equity mispricing. Further to that, this paper looks at the debt versus equity choice and the likelihood of equity mispricing. Thirdly, we test the repurchase decision whether it is driven by equity mispricing. Lastly, we aim to examine whether equity mispricing influences firms' decision to actively alter the financing mix by issuing a particular type of security and simultaneously reducing another. This is tested against a base of passive firms thus allowing us to draw conclusions with regards to the influence of market timing on firms issue decisions.

We are able to draw several main findings and conclusions from our study. First, firms increase debt levels during periods of undervaluation and depress debt levels during periods of overvaluation. This effect causes them to deviate from optimal levels of capital structure. This finding may suggest that timing of security issues work within a trade-off framework as managers trade off costs of deviating from target leverage with benefits from resorting to a relatively cheaper source of financing. Secondly equity mispricing does significantly influence the issue decision as well as issue size. Firms are more likely to issue debt during periods of undervaluation and equity during periods of overvaluation. Furthermore, firms are more likely to make debt (equity) reductions during periods of overvaluation (undervaluation). Lastly, we find that managers do actively issue debt and repurchase equity during periods of undervaluation. On the other hand, if equity is overvalued, we find that managers are also more likely to issue equity and retire debt. Thus, managers do swap one

form of capital for the other suggesting that market timing considerations play a critical role in firms financing mix.

The remainder of this paper is organized as follows. Section 2 discusses the relevant literature and provides the motivation for this study. Section 3 describes the data, provides the definitions of the variables used, explains the methodology used to value equity and describes the basic models used in this paper. Section 4 develops empirical tests on how equity mispricing influences deviation from target capital structure. Section 5 empirically tests the security issue decisions in a logit and multinomial logit framework. The last section concludes the main findings and discusses the implication from this study.

2. Review of the literature and Motivation

Studies on capital structure have shown that equity mispricing plays an important role in security issues. This section reviews the relevant literature and develops the main motivation for this paper. Firstly the review covers target leverage. Proponents of the trade-off theory argue that firms have an optimal target capital structure. Cost of capital would be minimized at this optimal rate, thus maximizing firm value. However given that market imperfections such as asymmetric information and financing costs exist, firms may temporarily deviate from these targets.

Secondly this section looks as how market timing influences security issue choice. Older studies of capital structure have focused on the pecking order and trade-off explanation of capital structure decisions while timing issues is fast becoming a central theme in capital structure. Survey evidence by Graham and Harvey (2001) finds that managers actively engage in timing the market. In a more relevant survey, Brounen, de Jong and Koedijk (2006) also find that timing is a key element managers take into account when making security issue choices in the UK. Baker and Wurgler (2002) attempt take this into a contextual framework and propose that capital structure is the cumulative outcome of previous timing attempts.

2.1 Optimal target and deviation from target

The trade-off theory proposes that firms have an optimal target capital structure which they aim to operate at to maximise value. Managers would balance the benefit gained from issuing debt versus the cost of issuing debt such as bankruptcy costs. The inclusion of tax benefits of debt and the bankruptcy penalties would allow the determination of an optimal capital structure (Hirshleifer, 1966). The trade-off between the tax benefit of debt and the deadweight costs of bankruptcy is shown in Kraus and Litzenberger (1973). After a certain point, the two effects just balance to reach equilibrium, where further borrowing would decrease the value of the firm.

Empirical studies have provided mixed results on target adjustment behaviour. Titman and Wessels (1988) find that transaction costs are an important determinant of capital structure suggesting that firms would balance costs vs. benefits of debt issues. Several other studies also support the notion of firms striving to maintain a target leverage.[1] In these studies the evidence indicates that managers do adjust issues and repurchasing to reach a particular target and the correlation between several firm specific characteristics such as the marginal or effective tax rate, the proxies for growth opportunities and size are in line with predictions from the trade off theory. Contrasting to this view, Shyam-Sunder and Myers (1999) find that the pecking order model outperforms the target adjustment model. The results theoretical implication stems from Myers (1977) where high growth firms should have a lower level of leverage, thus causing a negative correlation between growth proxies and leverage ratios.

Further evidence of target leverage is provided from survey results. Graham and Harvey (2001) find that managers admit to having a target ratio in mind when issuing debt. In the UK, Brounen, de Jong and Kodijk (2006) similarly find that managers take into account target levels of leverage when issuing debt. In addition to that the authors find that the tax advantage of interest payments, transaction costs of debt, debt levels of firms in similar industries and financial distress surrounding debt issues are important issues taken into consideration when managers make issue decisions. Further empirical evidence is provided by Hovakimian, Hovakimian and Tehranian (2004) who examine the role of dual issues and find that firms make dual issues to offset deviation from target levels that accumulate from

[1] See Graham (1996), Hovakimian, Opler and Titman (2001), Hovakimian (2004), Antoniou, Guney and Paudyal (2008).

earnings and losses. Leary and Roberts (2004) use a dynamic duration model to show that financing behaviour is consistent with the presence of adjustment costs.

Faulkender et al (2007) suggest that a plausible reason firms deviate from target capital structure would be due to managers having a target capital structure but also time security issues within a band around the target. In another recent study, Chang, Dasguta and Hillary (2006) find that firms that receive less analyst coverage issue equity less frequently and clumped in large issues. The authors show that there would be an inclination to time equity issues when conditions are more favourable. The theoretical underpinning would be that firms that receive less coverage would be faced with a higher degree of information asymmetry and thus their shares would be face more mispricing. If the equity was undervalued, these firms would have a stronger motivation to issue debt and thus move away from their target leverage. Once market conditions improve, firms would be inclined to issue equity to reduce reliance on debt and thus be able to reduce the deviation levels. Even if higher valuations would move firms closer to target market leverage levels, managers would still be inclined to issue more equity as they anticipate future difficulty in issuing. Managers are thus trading off the cost of being below their target leverage with the benefit of being over their targets in the future and building financial slack.

Further insight is provided by Hovakimian (2004) who shows that firms are able to pursue market-timing strategies because deviations and costs associated with deviating from target leverage induced by equity transactions are small and transitory. The author concludes that firms that have target debt ratios can engage in timing the equity market. . Alti (2006) also finds that firms time the market in the short-run but revert to target leverage eventually. In another recent study, Warr et al. (2011)show that firms that are over-levered would adjust faster to target leverage given that the present value of bankruptcy costs would be higher. More interestingly, over-levered firms would adjust faster to target leverage in the presence of overvaluation.

2.2 Security Issues and Repurchases

In a seminal study, Baker and Wurgler (2002) test the motivations for change in leverage ratios and find a strong link between external finance weighted average market to book ratio indicating that firms adjust leverage levels to suit external valuations. Thus managers would time issues when equity markets are favourable. The authors show that capital structure is the

aggregate outcome of firms' historical attempts at timing the market. Further evidence on managers' attempts to time the market is provided by the survey evidence of Graham and Harvey (2001). In a more relevant survey study by Brounen, de Jong and Keodijk (2006) mangers indicate that the three of the four most significant factors affecting debt levels in the UK are related to market timing.[2] The authors also find that equity mispricing is the main factor looked at managers when deciding on equity issues. Further to that, Hovakimian, Opler and Titman (2001) report that SEOs in the US have a strong correlation with stock prices. Marsh (1982) documents a similar pattern in the UK where firms tend to time equity issues when prices are high.

Further support for the market timing theory is seen in Welch (2004) who finds that equity price shows have a persistent effect on a firms capital structure. The author however finds that firms do not rebalance their capital structure in response to shocks in market value in spite of active net issuing activity. Thus, stock returns are seen as the primary drive of capital structure changes. Elliot, Koter-Kant and Warr (2007) find that firms are more likely to issue equity to fund their deficit when equity is overvalued. Studying managerial timing attempts, Jenter (2005) finds that managers attempt to actively time the market in both their own private trades and also at firm-level decisions. In a recent study, Hertzel and Li (2010) decompose the market-to-book ratio into two separate components, namely the growth and mispricing components. Their findings show that firms with higher element of mispricing decrease long-term debt and have a lower level of post-issue earnings. These results are consistent with the timing aspect of issuance activities.

In contrast to the above studies, several studies do not find support for the market timing theory. Hovakmian (2006) argues that the negative correlation between the market-to-book ratio and leverage is not driven by market timing considerations but rather it is capturing growth. In addition to this study, Flannery and Rangan (2006) find that more than half of the observed changes in leverage levels are brought about by targeting behaviour. In their study, less than 10% of changes can be explained by market timing and pecking order considerations. Further to these studies, Mahajan and Tartaroglu (2008) show that the negative relationship between leverage and the market-to-book ratio is not attributed to market timing and the evidence in their study supports the dynamic trade-off theory. The

[2] The top four attributes affecting leverage regimes in the UK are issuing debt when interest rates are particularly low, financing a deficit, equity undervaluation and changes in price of common stock.

debate is further extended by Liu (2009) who finds that the impact of time varying targets and adjustment costs indicates that the market-to-book ratio has a significant impact on leverage even when firms are not timing the market. The author further uses alternative proxies of market timing and is able to show they have no effect on leverage levels. Overall, Liu's study is more consistent with partial adjustment models.

The literature (Wansley, Lane and Sarker, 1989) suggests that firms repurchase shares for the following five reasons: reaching a target leverage, eliminating free cash flow, anti-takeover motive, signalling undervaluation and wealth transfer due to timing. Brockman and Chung (2001) and Chan, Ikenberry and Lee (2007) provide empirical evidence for timing of managerial ability to time repurchases. Ikenberry, Lakonishok and Vermaelen (2000) show that equity price movements drive repurchasing behaviour in the US. However, Rau and Vermaelen (2002) find that the majority of share buybacks in the UK are motivated by taxation purposes. This is in response to the regulation and taxes surrounding share repurchases in the UK. Oswald and Young (2004) however contend their findings for UK firms and show that as share prices fall, managers appear to respond by buying more shares and thus supporting the market timing framework to explain share buybacks. Interestingly, Doukas, Guo and Zhoue (2010) find that firms also time debt issues by issuing during periods of hot debt markets showing that managers time debt issues as well as equity issues. Their results also show that firms issue more debt during hot periods to repurchase shares, suggesting that managers also actively substitute debt and equity.

3. Data and Empirical Approach

3.1 Data description and descriptive statistics

We initially collect data for all firms in the U.K. available on Datastream during the period of 1981 – 2008.[3] Consistent with the literature we exclude financial firms from the sample and the selection is done based on the motif of measuring equity mispricing. The variables are defined as follows. Book debt, (BD), is defined as book debt divided by total assets. Market debt, (MD), is measured as the ratio of book value of total debt to market value of equity plus book value of total debt. The net debt issues, (Δdbl), is the net change in book debt over total assets. The net equity issues, (Δe), is the change in book equity less the change in retained earnings divided by total assets. The market-to-book ratio, (MTB) is measured as the ratio of

[3] Our sample includes dead firms to mitigate problems of survivor and selection bias.

book value of total assets less book value of equity plus market value of equity to book value of total assets. Non debt tax shield, (NDTS), are measured as the ratio of depreciation to total assets. SIZE is the natural logarithm of total assets in millions of 1981 pounds. Tangibility of assets, TANG, is defined as net plant, property and equipment over total assets. Effective tax rate, ETR, is total tax to total taxable income. Industry leverage, (INDL) is the median of the leverage levels of the industry the firm operates in. R&D and CAPEX are proxies for growth options defined as research and development expenses scaled by total assets, and capital expenditure divided by total assets, respectively. RDD is a dummy variable that takes the value of 1 if the data is not available in Datastream and zero otherwise. CASH is defined as cash and cash equivalents scaled by total assets.

To eliminate the outliers, we exclude firms year observations for values where BD, Δdbl and Δe that exceed 100% in absolute value. Missing firm-year observations are also excluded from the data set. The final sample comprises of 11,105 firm-year observations.

3.2. Equity Mispricing

We measure mispricing with the ratio of intrinsic value (IV) to current market price (MP).[4] Intrinsic value is measured as follows:[5]

$$\boldsymbol{V_{equity}} = \sum_{t=1}^{\infty} \frac{\boldsymbol{FCFE_t}}{(1+r_e)^t} \tag{1}$$

$$\boldsymbol{V_{equity}} = \sum_{t=1}^{\infty} \frac{\boldsymbol{FCFE_t}}{(1+r_e)^t} = \sum_{t=1}^{N} \frac{\boldsymbol{FCFE_t}}{1+r_e{}^t} + \frac{\boldsymbol{Terminal\ Value}}{(1+r_e)^N} \tag{2}$$

Terminal value is calculated as:

$$\boldsymbol{Terminal\ Value} = \frac{\boldsymbol{FCFE_N(1+g)}}{(r_e - g)} \tag{3}$$

where g is the long-term FCFE growth. Given that FCFE occurs throughout the year we make adjustments as follows:

$$\boldsymbol{V_{equity}} = \left[\sum_{t=1}^{N} \frac{\boldsymbol{FCFE_t}}{(1+r_e)^t}\right](\mathbf{1}+\boldsymbol{r_e})^{\mathbf{0.5}}$$

$$= \left[\frac{\boldsymbol{FCFE(1+g)}}{1+r_e{}^t}\right](\mathbf{1}+\boldsymbol{r_e})^{\mathbf{0.5}} \tag{4}$$

$FCFE_t$ is free cash flow to equity at time *t* and r_e is the cost of equity. FCFE is the sum of net income plus depreciation minus change in non cash working capital minus capital expenditure minus principal repayments of debt capital plus new debt issued. A firm's cost of equity is calculated as below:

[4] We utilize an approach similar to Elliot, Koeter-Kant and Warr (2007) and Warr et al (2011)
[5] This is based on Benninga (2011).

$$\boldsymbol{r_E = r_{rf} + \beta_i(r_m - r_{rf})} \quad (5)$$

where short-term treasury bills are used as a proxy for the risk free rate (r_{rf}), and r_m is the total market return.[6] β_i is measured as:

$$\boldsymbol{\beta_i = \frac{Cov_i market}{\sigma^2 market}} \quad (6)$$

where FTSE All Share Index is used as a proxy for market.[7] Similar to Elliot, Koeter-Kant and Warr (2007), our purpose is to measure deviation from fundamental value. This is measured as:

$$\boldsymbol{Misvaluation = \frac{IV_{it}}{MP_{it}}} \quad (7)$$

where IV_{it} is intrinsic value and MP_{it} is market value of equity. In our study we use a dummy variable, UNDVD, which takes the value of 1 if the firm is undervalued (indicating that misvaluation is greater than one).

3.3. Estimation procedure

The first section of our empirical tests involves estimation procedure in two stages that are described as the following equations:

$$\boldsymbol{D_{it+1} = B_{0_{it}} + W_{it}\alpha + \varepsilon_{it}} \quad (8)$$

$$\boldsymbol{DIST_{it} = \beta_0 + \beta_1 UNDVD_{it} + \gamma[controls]_{it} + D_{(hi)it} + D_{(lo)it} + \varepsilon_{it}} \quad (9)$$

In the first stage, equation 8 as above, the debt (book and market) to asset ratio is regressed on a vector of explanatory variables, W, that have been used in past studies as determinants of capital structure.[8] We estimate the debt ratio at time t+1 similar to Flannery and Rangan (2006) where D_{it+1} would be a firm i's desired debt ratio at t+1. The purpose of this first stage would be to estimate a firm's target leverage that is defined as the debt ratio that the firms would choose to be at in the absence of transaction costs, asymmetric information and other adjustment costs. In the second stage we model the distance from the target which is measured as the fitted values from estimations in equation 8 minus actual debt ratio with a set of explanatory and control variables. The key explanatory variable is the undervaluation dummy (UNDVD) which takes the value of one when firms equities are undervalued and zero when equities are overvalued. The D_{hi} and D_{lo} takes the value of one (zero otherwise) if

[6] See Elliot, Koeter-Kant and Warr (2007).
[7] We estimate beta using a 36 month rolling approach. Our results are similar using a 60 month approach.
[8] See Hovakimian, Opler and Titman (2001), Hovakimian (2004), Hovakimian, Hovakimian and Tehranian (2004), Flannery and Rangan (2006), Antoniou, Guney and Paudyal (2008), and Warr et al (2011).

the debt ratio at the beginning of the period is in the top and bottom twentieth percentile correspondingly. These dummies are intended as a control to capture target adjustment behaviour.

The second part of our empirical tests looks at the how well the undervaluation dummy predicts the likelihood that the firm will issue a particular type of security. Our approach is to use a binary variable to represent the issue type where the issue choice is modelled as follows:

$$\boldsymbol{Issue\ Type_{it} = \beta_0 + \beta_1 UNDVD_{it} + \gamma[controls]_{it} + \varepsilon_{it}} \quad (10)$$

where Issue $Type_{it}$ takes the value of 1 if the firm issues debt and 0 if the firms issues equity. A firm is defined as issuing debt if the ratio of net debt issued to total assets exceeds 5%. Similarly, a firm is issuing equity if the ratio of net equity issued exceeds 5%.[9] The key explanatory variable is again the undervaluation dummy (UNDVD). Control variables are included based on the literature.[10]

4. Target Leverage and Deviation from Target Leverage

In this section we examine the first part of our empirical analysis which looks at what factors firms consider when determining their target leverage and deviating from this target. This is done by estimating the first stage of the regressions as expressed in equation 8. The list of the explanatory variables used to regress target leverage and distance from target leverage as well as their expected relation are described in table 1.[11]

[Insert table 1 about here]

4.1. Determinants of Target Leverage

The results from the regression to determine the target leverage D_{t+1} are reported in table 2. We estimate the expression from equation 8 using the Fama and MacBeth (1973) framework as suggested in Fama and French (2002). In order to provide further robustness of our results, we further utilise the approach used in Hovakimian, Opler and Titman (2001). Thus we also report estimates censored both below (by the value of zero) and above (by the value of one)

[9] This approach is in line with similar studies in the literature i.e. Hovakimian (2004) and Hovakimian, Hovakimian and Tehranian (2004). Gaud, Hoesli and Bender (2007).
[10] See Hovakimian, Opler and Titman (2001), Hovakimian (2004), Hovakimian, Hovakimian and Tehranian (2004), Gaud, Hoesli and Bender (2007, and Elliot, Koeter-Kant and Warr (2008).
[11] We base our expectations based on Titman and Wessels (1988), Hovakimian, Opler and Titman (2001), Mao (2003), Flannery and Rangan (2006) and Warr et al (2011) as well as theoretical expectations.

using a Tobit regression with double censoring to provide a consistent estimate. In line with our expectations, we find that growth opportunities as captured by the market-to-book ratio has a negative coefficient and is highly significant for both the market and book debt target ratio suggesting that firms tend to protect their future growth opportunities by limiting its leverage. Flannery and Rangan (2006) and Warr et al (2011) report a similar correlation. The non-debt tax shields have a positive correlation with target debt ratio which is consistent with results in Titman and Wessels (1988) and Mao (2003). Firms that possess relatively more fixed assets that generate higher levels of depreciation and thus tax credits indicating that such assets would have higher collateral value for securing debt which in turn increases the debt capacity of firms allowing them to have higher level of target leverage (see Mackie-Mason, 1990). Firm size has a positive and significant coefficient as expected given that larger firms would be have a more diversified cash flow which would be less volatile and thus more secure in servicing interest payments. A less volatile cash flow would also increase profitability and thus allow firms to fully use the tax shield of debt and thus reduce the probability and expected bankruptcy costs (see Hovakimian, Opler and Titman, 2001).

[Insert table 2 about here]

Tangibility also has a positive and significant correlation with target debt leverage suggesting that tangible assets serve as collateral and thus allow firms a higher debt capacity. Flanner and Rangan (2006) also report similar findings. The estimates reveal an inversely significant correlation with the effective tax rate which could be due to reverse causality i.e. firms with lower levels of leverage pay higher effective tax rate.[12] It remains puzzling why firms do not increase leverage levels to minimize their tax burden. The industry leverage has a positively significant coefficient indicating that leverage levels are influenced by industry effects (see Roberts, 2002).

4.2. Deviation from Target Leverage and Equity Mispricing

In this section we utilise fitted values from the results in the earlier section to measure the distance from target leverage which is the difference between the target leverage and the actual leverage ($D_{t+1} - D_t$). If firms are over leverage the distance measure would be negative and if firms are below their target the distance measure would be positive. The explanatory and control variables are lagged to control for endogeneity. We estimate the regression as

[12] Antoniou, Guney and Paudyal (2008) also find a similar correlation.

expressed in equation 9 to model the determinants of deviation from target leverage. If firms timing behaviour did not influence deviation from target leverage, the coefficient for the undervaluation dummy would not be different from zero. We expect the coefficient of the dummy to be negative as firms would issue more debt during periods of undervaluation relative to periods of overvaluation and thus have higher leverage levels. The results for this estimation are reported in table 3.[13] The coefficient of the undervaluation dummy is negatively significant as expected. The results are similar for market and book debt for both different sets of methods used to estimate target leverage. This suggests that the benefit of market timing outweighs the cost of deviating from target leverage.

[Insert table 3 about here]

Given that our estimations above assume that firms did not initially deviation from their target leverage, it may be suspect to endogeneity problems. To address this concern, we estimate the following regression:

$$\Delta \boldsymbol{DIST_{it}} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 UNDVD_{it}} + \boldsymbol{\gamma}[\boldsymbol{controls}]_{\boldsymbol{it}} + \boldsymbol{D_{(hi)it}} + \boldsymbol{D_{(lo)it}} + \boldsymbol{\varepsilon_{it}} \quad (11)$$

The undervaluation dummy again is intended to capture timing behaviour. If timing behaviour does indeed influence deviation from target leverage, we expect that β_1 to be significantly different from zero and the coefficient to have an inverse relation with the change in distance from target leverage as firms would issue more leverage during periods of undervaluation. The results for estimating equation 11 are reported in table 4. We find that the coefficient for the undervaluation dummy to be negative and very significant. This indicates that firms are timing the market by increasing equity issues during periods of overvaluation and increasing debt issues during periods of undervaluation. Thus during periods of undervaluation, the change in distance from target leverage would be decreasing suggesting that firms would further be over-levered. The results further support the notion that the benefit gained from timing the market outweighs the cost of deviating from optimal levels.

[Insert table 4 about here]

[13] Regressions control for firm fixed effects, include unreported year dummies and report Rogers (1993) standard errors (see Peterson, 2009 for further details).

We provide further evidence of equity mispricing driving deviation from target capital structure by looking at firms that over their targets and below their targets separately. We would be able to draw more insights from these analyses. The market timing theory would predict that firms issue more debt during periods of undervaluation and thus cause them to be temporarily over-levered.[14] In this section, we measure distance as an absolute measure of difference between the target and the actual debt ratio.[15] The results for regressions are reported in the first four columns of table 5. All four columns indicate that the coefficient is positive as expected, suggesting that firms increase leverage levels during periods of undervaluation and thus would be over-levered. The coefficients for the first two columns suggest that firms would be about 2% over their target leverage during periods of undervaluation. The coefficient of the undervaluation dummy for the next two columns are however not significantly different from zero. This could stem from the fallacy of our assumption that firms did not initially deviate from their target leverage. In order to address this concern, we estimate the difference in distance as expressed in equation 11. To control for target adjustment behaviour affecting distance levels, we include the lagged leverage variable in the regression. The results are reported in the last four columns of table 5. We find that all the coefficients are positive and very significant as expected, thus confirming our earlier findings.

[Insert table 5 about here]

We further analyse firms which are below their target levels, where the current debt level is below the fitted values as determined from table 2. To consistently estimate the effect of equity mispricing we substitute the undervaluation dummy with the overvaluation dummy which takes the value of 1 if equities are overvalued (zero otherwise). If firms were timing the equity market, they would increase reliance on equities during periods of overvaluation and thus depressing their leverage ratios. If we assume that firms did not initially deviate from their target levels, market timing would cause firms to increase their absolute distance levels. We regress the expression in equation 9 with the overvaluation dummy as the key explanatory variable and the results are reported in the first four columns of table 6. If firms were indeed timing the market, we expect the dummy to significantly different from zero and the coefficient to have a positive value. The results indicate that the dummy has a positive

[14] We assume that firms did not initially deviate from their target levels.
[15] Our approach draws from Hovakimian, Opler and Titman (2001) where leverage deficit is measured in absolute terms.

and very significant coefficient. Thus firms were indeed timing the market by issuing equities during periods of overvaluation and thus depressing the leverage ratio, causing firms to be under-levered. Relaxing the assumption that firms are operating at their target levels, we regress the change in distance and the results are reported in the last four columns of table 6. We find that the overvaluation dummy has a positive and significant coefficient as expected, confirming our earlier findings. Thus we are able conclude that firms indeed to adjust their issues to reflect equity mispricing. Managers increase equity issues during periods of overvaluation and reduce reliance on debt levels causing firms to deviate from their target levels. In the presence of undervaluation, firms would resort to debt financing leading to the over-levered scenario.

[Insert table 6 about here]

5. Equity Mispricing and Security Issue Choice

In this section we discuss the second part of our empirical analysis. This section will look at how equity mispricing influences firms' security choice. In a multivariate analysis using logistic models, we test how well equity mispricing predicts the likelihood that a firm will issue a particular type of security. The key explanatory variable will be our mispricing measure, the undervaluation dummy and the estimates will done by including control variables drawn from previous studies of capital structure.[16] Given the predictions of the market timing theory, we expect the undervaluation dummy to have a positive coefficient in the debt vs. equity choice.

5.1. Determinants of Issue Choice and Size

The non-debt tax shield is expected to have a negative coefficient as DeAngelo and Masulis (1980) argue that tax deductions for depreciations can substitute as tax benefits of debt financing. Size and tangibility are expected to have a positive coefficient as larger firms and firms with more tangible assets are more likely to issue debt over equity. We expect the sign of the effective tax rate to be positive. Similar to Elliot, Koeter-Kant and Warr (2008) we include leverage and the industry median leverage as a proxy for target leverage. Following Hovakimian, Hovakimian and Tehranian (2004) we include issue size and expect a negative correlation due to equity issues being larger than debt issue.

[16] Our controls are based on our empirical priors i.e. Rajan and Zingales (1995), Hovakimian, Opler and Titman (2001),Flannery and Rangan (2006), Hovakimian (2006) and Elliot, Koeter-Kant and Warr (2008).

In the spirit of Elliot, Koeter-Kant, and Warr (2007 and 2008) we exclude the market-to-book ratio to avoid the multiple interpretations associated with this ratio. Given that the main aim is to separate the growth and valuation measures in our regressions, we instead capture growth opportunities via the inclusion of capital expenditure and research and development expenses as well as the RDD dummy which takes the value of 1 if research and development expenses is not available in Datastream. We expect the coefficient of capital expenditure to be positive given that tangible investments would generate a more fixed stream of income and thus more likely to be financed via debt issues. Research and development on the other hand is expected to be negatively related with debt issues. Lastly we include cash and expect a negative relationship with debt issues.

We report the regressions as expressed in equation 10 in the first column of table 7 for pure debt issues versus pure equity issues.[17] The explanatory variables have some expected results and some surprising results. For instance, issue size has a negatively significant coefficient indicating that equity issues are larger than debt issues. Cash and research and development expenses also have an inverse correlation as expected. Capital expenditure on the other hand as a positive sign as expected. Surprisingly the coefficients for asset tangibility, firm size, non-debt tax shield and effective are negative. More importantly the undervaluation dummy has a positive and is significant at 1%. This suggests that equity mispricing strongly predicts security issue choice. In the third column we report the results for all debt issues (which include simultaneous debt issues and equity repurchasing) as well as all equity issues (which include equity issues and debt retired). The coefficient is larger and is significant at 1%. Next we consider the repurchase decision.[18] Given that the market timing theory would imply that firms repurchase equity during periods of undervaluation and retire debt during periods of overvaluation, we change the binary variable issue type to be 1 when firms are repurchasing equity and 0 when firms are retiring debt. The results for estimating pure equity repurchases versus pure debt retired are reported in column 5 of table 7. We find that the undervaluation dummy is positive and significant as expected. Thus equity mispricing does indeed drive repurchasing behaviour. Column 7 in the table further considers all equity repurchases versus all debt retired. The results are as expected where the undervaluation dummy has a larger coefficient and is significantly different from zero.

[17] All regressions contain unreported year dummies and robust standard errors clustered at firm level as discussed in detail in Peterson (2009).

[18] Firms are defined as retiring debt when net debt issued scaled by assets is less than -5% and repurchasing equity when net equity issued is less than -5%.

[Insert table 7 about here]

Hovakimian, Opler and Titman (2001) find that issue size should be considered differently from issue choice and thus we consider issue size separately. Following their definition of issue size (net debt issued scaled by assets at the beginning of the year), we report the results in the second and fourth column of table 7. We find that the undervaluation dummy is positive as expected and remains significant at 1%. In addition the effect is larger for issue size, indicating that the impact of market timing is larger on issue size relative to issue choice. Further to that we consider repurchase size as well. The results for pure repurchase size are reported in column 6 of table 7. Similarly, equity mispricing is significantly predicts repurchasing behaviour. Furthermore, we consider all repurchases in the last column of the table and find that the effect is larger and significant. Thus we are able to conclude that the market timing theory is able to predict security issue and repurchase choice as well as size.

5.2. Considering Passive Firms

In this section we consider issue choice for a firm against a no-transaction alternative. This allows us to examine how equity mispricing and market timing influences the decision to issue (or repurchase) versus a passive framework. This enriches our analysis at it allows to test whether market timing influences issue decision as well as type of issue. We estimate the following eight different scenarios relative to a no issue alternative:

i. Pure debt issue versus no issue
ii. Issue debt and repurchase equity versus no issue
iii. All debt issue versus no issue
iv. Equity repurchase versus no repurchase
v. Equity issue accompanied by debt reduction versus no issue
vi. All equity issue versus no issue
vii. Debt reduction versus no reduction

The results of the first scenario are reported in the first column of table 8. We find that the undervaluation dummy is positive and significant thus the probability of issuing debt versus no issue is higher during periods of undervaluation. The results in the second column shows that the undervaluation dummy has a larger coefficient suggesting that equity mispricing plays a more important role in debt issues accompanied by equity reductions. The results in the third column are similar to that of the first column as expected. In the fourth column we

report the fourth scenario, and find that the undervaluation dummy has a positive sign and is significant. This suggests that equity reduction decision can be significantly attributed to equity undervaluation. The fifth to seventh column shows that the undervaluation dummy has a significantly negative coefficient as expected. Similar to the results for debt issues accompanied with equity reductions, equity issues accompanied with debt reductions are more influenced by equity mispricing. This suggests that equity mispricing plays an important role in firms' decisions to substitute one form of financing for another. The last column reports the decision to reduce to debt levels versus a no reduction scenario. The undervaluation dummy has a negative sign as expected and is statistically significant.

[Insert table 8 about here]

Next, we model firms' decisions to make security issues and reductions against passive firms' alternative. We look at the decisions in two separate frameworks. Firstly we look at pure debt issue, pure equity issues, pure debt reductions, pure equity repurchases and passive firms. We model the issue type decision in equation type using passive firms as a base in a multinomial logit model. The results are reported in table 9. Consistent with the predictions of the market timing theory, the undervaluation dummy has a positive correlation with the pure debt issue decision as documented in the first column. The second column shows that the undervaluation dummy has a negative correlation as predicted by the market timing theory. The correlation for the pure debt reductions is also negative in the third column. This implies that during periods of overvaluation firms are more likely to reduce debt. The last column indicates that firms are also likely to repurchase equity during periods of undervaluation. The results imply that firms are more likely to issue debt rather than repurchase equity during periods of undervaluation. Further to that, firms are more likely to reduce debt during periods of overvaluation relative to issue equity.

[Insert table 9 about here]

Lastly, we include pure debt issues, debt issues accompanied with equity repurchase, pure equity issues, equity issues accompanied with debt reduction, pure equity repurchase and passive firms as a base. The results of the multinomial logit regression are reported in the table 10. Looking across the table, the signs of the undervaluation dummy is as expected and significant at 1% indicating that equity mispricing is a significant determinant of firms financing decisions. Looking at the first two columns we find that equity mispricing plays a more important role in firms issuing debt accompanied with equity repurchased than in pure

debt issues. Columns 3 and 4 indicate that equity mispricing plays a more important role in firms decisions to issue equity accompanied with debt reductions relative to pure equity issues. Comparing the results in the last two columns further confirms this notion.

To summarize, firms time the market and are more likely to issue debt relative to equity during periods of undervaluation. Debt reductions and equity repurchases are also equally influenced by equity mispricing suggesting that firms also time repurchases as well as security issues. Further, we show that issue and repurchase size is also determined by equity mispricing. We also find that firms are more likely to issue or repurchase relative to a no action base due to market timing considerations. Furthermore, market timing considerations influence timing of issues accompanied by reductions relative to pure issues or repurchases.

6. Conclusion

Previous studies have documented market timing plays an important role in firms issue decisions. In this paper we examine the issue decisions for UK firms. The findings reveal how firms time their issues and its influence on firms' capital structure. This paper looks at how such timing decisions influence deviation from target leverage levels. We further investigate the impact of market timing on issue choice and size as well as repurchasing choice and size. Expanding the empirical test, we scrutinize whether firms decision to simultaneously issue and repurchase securities are influenced by market timing considerations.[19]

Looking at the first section of our empirical specifications, we find that firms time security issues and these timing attempts causes them to deviate from target levels. This finding is robust whether we assume firms do or do not initially deviate from target leverage. These findings allow us to infer that firms are trading off the cost of deviating from target with the benefit gained from timing the market. We further examine the effect for firms above and under their target levels and arrive at similar conclusions. The second section of our analysis looks at timing of security issues. We find that both security issue and repurchasing choice and size is driven by equity mispricing, indicating that market timing plays an important role in both decisions. Furthermore, we find that decision to issue versus a no issue alternative is

[19] We estimate equity issues accompanied with debt reductions and debt issues accompanied by equity repurchasing.

also significantly determined by market timing considerations. Lastly we find that firms reduce (increase) debt levels and increase (decrease) equity issues in periods of undervaluation (overvaluation). This allows us to conclude that firms are actively substituting one form of financing with the other to lower overall cost of capital in order to maximise value.

We are thus able to conclude that firms significantly time the market. The effect is evident and leads to firms deviating from their target levels. Issuing and repurchasing behaviour is also driven by market timing attempts. This is robust to considering issue choice and also issue size. Firms also actively change the financing mix to reflect equity mispricing and thus market timing plays a critical role in determining capital structure decisions.

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Table 1: Predictions of Target Leverage and Distance from Target Leverage.

	Predicted Effect on	
	Target Leverage	Deviation from Targer Leverage
UNDVD		-
MTB	-	-
NDTS	+	
SIZE	+	
TANG	+	
ETR	+	
INDL	+	

Table 2 Determinants of Target Leverage

	BD(t+1) FM	MD(t+1) FM	BD(t+1) TOBCENS	MD(t+1) TOBCENS
CONS	-0.1399***	-0.0556	-0.0341***	-0.1611***
	(0.0235)	(0.0397)	(0.0041)	(0.0513)
MTB	-0.0045**	-0.0730***	-0.0060**	-0.0534***
	(0.0020)	(0.0095)	(0.0029)	(0.0033)
NDTS	0.2435***	0.2072*	0.1767**	0.0200
	(0.0538)	(0.1127)	(0.0754)	(0.0748)
SIZE	0.0179***	0.0194***	0.0229***	0.0207***
	(0.0010)	(0.0019)	(0.0020)	(0.0023)
TANG	0.0946***	0.1041***	0.1590***	0.1828***
	(0.0174)	(0.0206)	(0.0157)	(0.0197)
ETR	-0.0135***	-0.0193***	-0.0055***	-0.0085***
	(0.0030)	(0.0038)	(0.0013)	(0.0015)
INDL	0.5450***	0.7295***	0.7442***	0.8523***
	(0.1024)	(0.1748)	(0.2175)	(0.2496)
N	11105	11105	11105	11105
F-Test/ Prob>chi2	0.0000	0.0000	0.0000	0.0000
Average R^2/Log likelihood	0.1463	0.2162	2721	1005
Period	1981-2008	1981-2008	1981-2008	1981-2008

Table 3: Determinants of Distance (DIST) From Target leverage

	DISTBDFM	DISTBDTOB	DISTMDFM	DISTMDTOB
CONST	0.0786***	-0.0942***	0.0993**	0.0114
	(0.0340)	(0.0340)	(0.0407)	(0.0407)
UNDVD	-0.0175***	-0.0170***	-0.0123***	-0.0124***
	(0.0023)	(0.0022)	(0.0025)	(0.0028)
MTB	-0.0028	-0.0044**	-0.0456***	-0.0260***
	(0.0017)	(0.0017)	(0.0022)	(0.0022)
NDTS	0.1775***	0.1107**	0.1722***	-0.0151
	(0.0448)	(0.0448)	(0.0459)	(0.0459)
SIZE	0.0031	0.0081**	-0.0006	0.0007
	(0.0033)	(0.0033)	(0.0035)	(0.0035)
TANG	-0.0090	0.0554***	-0.0013	0.0774***
	(0.0191)	(0.0191)	(0.0184)	(0.0184)
ETR	-0.0119***	-0.0038***	-0.0165***	-0.0057***
	(0.0007)	(0.0007)	(0.0008)	(0.0008)
D_{hi}	-0.2547***	-0.2456***	-0.3160***	-0.3595***
	(0.0080)	(0.0079)	(0.0085)	(0.0086)
D_{lo}	0.0787***	0.0766***	0.0771***	0.0744***
	(0.0046)	(0.0043)	(0.0164)	(0.0053)
N	11105	11105	11105	11105
R^2	0.7683	0.7616	0.7779	0.7746
Adjusted R^2	0.7322	0.7245	0.7456	0.7395
Wald(p-values)	0.0000	0.0000	0.0000	0.0000
Period	1981-2008	1981-2008	1981-2008	1981-2008

Table 4: Determinants of Distance and Change of Distance from Target Leverage: Over-Levered Firms

	DISTBDFM	DISTBDTOB	DISTMDFM	DISTMDTOB	ΔDISTBDFM	ΔDISTBDTOB	ΔDISTMDFM	ΔDISTMDTOB
CONST	-0.1358*	0.0227***	0.1761**	0.2460**	-0.1577***	-0.0625	-0.0366***	-0.1389**
	(0.0740)	(0.0068)	(0.0713)	(0.0749)	(0.0669)	(0.0645)	(0.0067)	(0.0641)
UNDVD	0.0214***	0.0232***	0.0064	0.0082	0.0454***	0.0409***	0.0437***	0.0394***
	(0.0040)	(0.0043)	(0.0051)	(0.0055)	(0.0037)	(0.0040)	(0.0048)	(0.0063)
MTB	0.0091*	0.0087*	0.0125***	-0.0058	0.0090**	0.0105**	0.0663***	0.0093*
	(0.0050)	(0.0049)	(0.0044)	(0.0044)	(0.0043)	(0.0042)	(0.0039)	(0.0050)
NDTS	0.0874	0.1252	-0.0638	-0.0159	-0.3170***	-0.2007*	-0.2577***	-0.1019
	(0.0969)	(0.0886)	(0.1016)	(0.0914)	(0.1082)	(0.1145)	(0.0902)	(0.1012)
SIZE	-0.0171**	-0.0192***	-0.0026	-0.0072	0.0042	-0.0002	0.0032	0.0125**
	(0.0069)	(0.0067)	(0.0062)	(0.0062)	(0.0061)	(0.0063)	(0.0061)	(0.0057)
TANG	0.0934**	0.0603	0.0890**	0.0355	-0.0806***	-0.1138***	-0.0871***	-0.0825***
	(0.0397)	(0.0421)	(0.0397)	(0.0411)	(0.0257)	(0.0283)	(0.0264)	(0.0263)
ETR	0.0057***	0.0007	0.0065***	-0.0006	0.0161***	0.0067***	0.0238***	0.0070***
	(0.0014)	(0.0014)	(0.0021)	(0.0021)	(0.0013)	(0.0013)	(0.0016)	(0.0022)
BD/MD	-	-	-	-	0.6126***	0.6250***	0.6819***	0.4360***
	-	-	-	-	(0.0290)	(0.0333)	(0.0307)	(0.0337)
N	4978	4663	5259	4632	3881	3612	4075	3525
R^2	0.5947	0.5830	0.5492	0.5356	0.4719	0.4698	0.4797	0.3056
Adjusted R^2	0.5014	0.4848	0.4427	0.4187	0.3489	0.3433	0.3536	0.1261
Wald(p-values)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Period	1981-2008	1981-2008	1981-2008	1981-2008	1982-2008	1982-2008	1982-2008	1982-2008

Table 5: Determinants of Distance and Change of Distance from Target Leverage: Under-Levered Firms

	DISTBDFM	DISTBDTOB	DISTMDFM	DISTMDTOB	ΔDISTBDFM	ΔDISTBDTOB	ΔDISTMDFM	ΔDISTMDTOB
CONST	0.0802***	-0.0117	-0.1914***	0.1472***	-0.1182***	-0.1789***	-0.1141***	-0.1420***
	(0.0209)	(0.0235)	(0.0310)	(0.0307)	(0.0178)	(0.0189)	(0.0399)	(0.0348)
OVVD	0.0063***	0.0062***	0.0059***	0.0082***	0.0165***	0.0216***	0.0214***	0.0223***
	(0.0016)	(0.0018)	(0.0020)	(0.0020)	(0.0018)	(0.0018)	(0.0036)	(0.0023)
MTB	-0.0026***	-0.0034***	0.0400***	-0.0250***	-0.0044***	-0.0051***	-0.0464***	-0.0145***
	(0.0007)	(0.0008)	(0.0021)	(0.0019)	(0.0009)	(0.0009)	(0.0036)	(0.0029)
NDTS	0.1527***	0.1029***	-0.1026***	-0.0091	0.1848***	0.1399***	0.2103***	0.0769
	(0.0274)	(0.0284)	(0.0352)	(0.0351)	(0.0244)	(0.0294)	(0.0467)	(0.0467)
SIZE	0.0035*	0.0043**	0.0019	-0.0025	0.0112***	0.0133***	0.0174***	0.0089***
	(0.0020)	(0.0021)	(0.0026)	(0.0026)	(0.0015)	(0.0016)	(0.0040)	(0.0034)
TANG	0.0207*	0.0630***	-0.0072	0.0674***	0.0507***	0.0840***	0.0656***	0.0963***
	(0.0124)	(0.0134)	(0.0137)	(0.0145)	(0.0096)	(0.0107)	(0.0148)	(0.0131)
ETR	-0.0088***	-0.0035	0.0118***	-0.0050***	-0.0142***	-0.0059***	-0.0202***	-0.0071***
	(0.0010)	(0.0007)	(0.0012)	(0.0007)	(0.0008)	(0.0006)	(0.0012)	(0.0009)
BD/MD	-	-	-	-	-0.6356***	-0.6022***	-0.6846***	-0.4336***
	-	-	-	-	(0.0251)	(0.0237)	(0.0279)	(0.0272)
N	5816	6105	5433	6087	4579	4858	4269	4848
R^2	0.5691	0.6235	0.6313	0.6374	0.4493	0.4382	0.4571	0.3914
Adjusted R^2	0.4755	0.5449	0.5515	0.5626	0.3313	0.3225	0.3434	0.2690
Wald(p-values)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Period	1981-2008	1981-200	1981-2008	1981-2008	1982-2008	1982-2008	1982-2008	1982-2008

Table 6: Determinants of Financing Choice and Issue Size

	Pure Issues		All Issues		Pure Repurchases		All Repurchases	
	Issue Choice	Issue Size	Issue Choice	Issue Size	Issue Choice	Issue Size	Issue Choice	Issue Size
	Debt Vs Equity	Debt Vs Equity	Debt Vs Equity	Debt Vs Equity	Equity vs. Debt	Equity vs. Debt	Equity vs. Debt	Equity vs. Debt
CONST	-0.8398	0.9768	-1.6216	-0.7245	-1.3459	-2.6659**	-1.2874	-1.3773
	(1.0717)	(1.1916)	(1.0181)	(1.0715)	(1.1255)	(1.2299)	(1.2004)	(0.8765)
UNDVD	2.0940***	2.1921***	2.5769***	2.6910***	2.3898***	2.5178***	2.9572***	3.0242***
	(0.1359)	(0.1505)	(0.1147)	(0.1265)	(0.1840)	(0.2016)	(0.1450)	(0.15870
NDTS	-2.5573	-1.5525	-2.9133**	-2.5804	-12.0847***	-7.3370*	-11.6452***	-9.2671***
	(1.6726)	(2.4852)	(1.4722)	(2.5653)	(2.9258)	(4.1065)	(3.1938)	(3.5240)
SIZE	-0.0802*	-0.0512	-0.0185	0.0189	-0.0250	-0.0000	-0.0679*	-0.0300
	(0.0422)	(0.0482)	(0.0347)	(0.0387)	(0.0549)	(0.0582)	(0.0400)	(0.0413)
TANG	-1.5349***	-1.7870***	-1.2602***	-1.3855***	1.2591***	1.9497***	0.7436**	1.1109***
	(0.3235)	(0.3829)	(0.2838)	(0.3255)	(0.4723)	(0.4900)	(0.3716)	(0.3818)
ETR	-0.2731	-0.0134	0.0114	0.0093	0.0631	0.0299	0.1143*	0.0705
	(0.0390)	(0.0429)	(0.0375)	(0.0389)	(0.0718)	(0.0660)	(0.0652)	(0.0602)
LEVERAGE	9.1484***	8.2234***	6.7617***	5.8641***	-2.9381***	-2.7228***	0.0909	-0.1630
	(0.8654)	(0.9096)	(0.6344)	(0.6507)	(0.8243)	(0.8027)	(0.4771)	(0.4389)
INDL	-0.5465	-1.9657	-0.6605	-2.4618	3.8358	7.0570	0.7776	0.2310
	(4.2164)	(4.8815)	(3.5537)	(3.9496)	(5.9329)	(6.3583)	(4.1488)	(4.4351)
ISSUE SIZE	-9.0274***	-9.4374***	-3.7902***	-3.4598***	-0.9600	-1.7476**	-1.2066***	-1.5023***
	(0.7737)	(0.8717)	(0.4239)	(0.5353)	(0.7171)	(0.7053)	(0.3328)	(0.3830)
CAPEX	9.7125***	9.4456***	10.0413***	9.7504***	6.1285***	2.3020	7.7550***	5.6158***
	(1.3399)	(1.7608)	(1.1386)	(1.4713)	(2.0756)	(2.2023)	(1.5862)	(1.5280)
RD	-0.2552	-2.5880	-0.2394	-2.6862	3.6843	1.4028	0.6780	1.4114
	(1.6636)	(2.5019)	(1.2937)	(1.8523)	(2.6390)	(1.8182)	(1.5647)	(1.3693)
RDD	0.2522	0.4096**	-0.4690	0.0088	-0.2198	-0.6549	-0.2644*	-0.1685
	(0.1544)	(0.1848)	(0.1325)	(0.1536)	(0.2018)	(0.2010)	(0.1519)	(0.1576)
CASH	-2.8267***	-2.8615***	-2.5970***	-2.7981***	3.9922***	3.8292***	2.4159***	2.4841***
	(0.6713)	(0.7489)	(0.5364)	(0.6211)	(0.7536)	(0.7122)	(0.5486)	(0.5145)
N	2420	1835	3328	2613	1260	1151	2103	1883
Pseudo R^2	0.4887	0.4743	0.4490	0.4396	0.2960	0.2958	0.3350	0.3354
Prob > Chi2	0.0000	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
Period	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008
Dep = 1	1313	1072	1742	1456	530	490	908	833
Dep = 0	1107	763	1586	1157	730	665	1194	1050

Table 7: Determinants of Issue Choice: Considering Passive Firms

	Pure Debt Issue vs No Issue	Debt Issue & Equity Reduction vs No Issue	All Debt Issues vs No Issue	Equity Reduction vs No Reduction	Equity Issue vs No Issue	Euqity Issue and Debt Reduction vs No Issue	All Equity Issues vs No Issue	Debt Reduction vs No Reduction
CONST	-1.2079*	-2.3108**	-1.1082	-3.8692***	0.4141	-0.7137	0.7430	-0.8515*
	(0.7329)	(0.9219)	(0.7125)	(1.0212)	(0.7617)	(1.3139)	(0.6796)	(0.5146)
UNDVD	1.5088***	1.8318***	1.5330***	0.8152***	-0.9273***	-3.0300***	-1.2924***	-1.4141***
	(0.0944)	(0.1817)	(0.0881)	(0.1125)	(0.0941)	(0.2803)	(0.0899)	(0.1007)
NDTS	-8.4253***	-5.0509	-7.1614***	0.3998	1.1002	4.9136***	2.1065**	7.1144***
	(2.1452)	(4.0156)	(2.0807)	(1.5681)	(1.0096)	(1.5135)	(0.9151)	(1.3663)
SIZE	-0.1857***	-0.2205***	-0.1939***	0.0271	-0.1222***	-0.0840**	-0.1181***	0.0170
	(0.0253)	(0.0428)	(0.0235)	(0.0363)	(0.0264)	(0.0403)	(0.0230)	(0.0236)
TANG	-1.7395***	-1.3275***	-1.7796***	0.1747	-1.0186***	-0.7076**	-0.8709***	-0.6737***
	(0.2558)	(0.4121)	(0.2417)	(0.3059)	(0.2769)	(0.3500)	(0.2244)	(0.2327)
ETR	-0.0556*	0.0911*	-0.0352	0.0104	-0.0866***	-0.0735**	-0.0910***	-0.0454*
	(0.0326)	(0.0522)	(0.0309)	(0.0346)	(0.0266)	(0.0337)	(0.0264)	(0.0274)
LEVERAGE	7.7240***	8.8327***	8.2038***	-0.1742	-0.2685	2.4595***	0.5351	2.3061***
	(0.4440)	(0.5262)	(0.4302)	(0.5402)	(0.3989)	(0.4735)	(0.3304)	(0.3429)
INDL	-0.5031	-4.4273	-1.4223	1.5003	0.0764	-2.5854	-0.5558	-4.6889*
	(2.8832)	(4.7029)	(2.6259)	(3.8521)	(2.9413)	(4.4860)	(2.3003)	(2.7792)
CAPEX	11.0601***	8.7229***	10.9711***	0.0689	1.1771	-2.0892	0.2375	-3.8753***
	(1.1859)	(1.8306)	(1.1158)	(1.1362)	(0.8938)	(1.5265)	(0.7878)	(1.1812)
RD	-1.3357	4.0140***	0.4990	-1.0231	1.8789***	0.6857	1.6894***	-0.5050
	(1.7655)	(1.2399)	(1.2547)	(1.1679)	(0.5607)	(1.0799)	(0.5334)	(1.1592)
RDD	0.0379	-0.2191	0.0442	-0.0950	0.0804	0.1259	0.1178	0.0152
	(0.0954)	(0.1564)	(0.0861)	(0.1216)	(0.0986)	(0.1514)	(0.0927)	(0.1002)
CASH	-3.4184***	-0.6088	-2.8945***	0.7180**	-0.2015	-0.6455	-0.2547	-2.7916***
	(0.4386)	(0.6155)	(0.3732)	(0.3195)	(0.2430)	(0.4076)	(0.2237)	(0.4213)
N	6115	4960	6518	5240	5929	5295	6410	5572
Pseudo R^2	0.2815	0.3262	0.2972	0.0527	0.0917	0.1491	0.0948	0.1135
Prob > Chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Period	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008
Dep = 1	1417	351	1820	635	1223	453	1669	934
Dep = 0	4698	4609	4698	4605	4706	4842	4741	4638

Table 8: Multinomial Logit Analysis of Pure Security Issues and Reductions (Passive Firms are the Base)

	Pure Debt Issue	**Pure Equity Issue**	**Pure Debt Reductions**	**Pure Equity Repurchase**
CONST	-2.3424***	-1.2445***	-1.3406***	-2.2811***
	(0.1020)	(0.0838)	(0.0872)	(0.1083)
UNDVD	1.4466***	-0.9716***	-1.3866***	0.6902***
	(0.0843)	(0.0875)	(0.0927)	(0.1039)
NDTS	-6.6032***	1.3343	5.1898***	0.9733
	(1.8351)	(1.0073)	(1.1623)	(1.3920)
SIZE	-0.1577***	-0.1157***	0.0168	0.0386
	(0.0226)	(0.0255)	(0.0216)	(0.0352)
TANG	-1.5851***	-1.0405***	-0.7586***	0.1560
	(0.2179)	(0.2692)	(0.2147)	(0.2828)
ETR	-0.0735**	-0.0771***	-0.0531**	0.0109
	(0.0305)	(0.0264)	(0.0264)	(0.0322)
LEVERAGE	6.7055***	-0.3803	2.5325***	-0.4718
	(0.3476)	(0.4452)	(0.3408)	(0.5566)
INDL	0.4898	0.0656	-4.3337*	0.9452
	(2.6750)	(2.8421)	(2.5245)	(3.4380)
CAPEX	10.0299***	1.3648	-3.3064***	0.3274
	(0.9122)	(0.9940)	(1.0680)	(1.0533)
RD	-1.5625	2.1508***	-0.0774	-0.4767
	(1.5915)	(0.5257)	(1.0141)	(0.9838)
RDD	-0.0166	0.0810	0.0332	-0.0986
	(0.0903)	(0.0955)	(0.0972)	(0.1163)
CASH	-3.3252***	-0.2309	-2.7124***	0.5947*
	(0.3947)	(0.2359)	(0.3697)	(0.3048)
N	9200	9200	9200	9200
Pseudo R^2	0.1276	0.1276	0.1276	0.1276
Prob > Chi2	0.0000	0.0000	0.0000	0.0000
Period	1981-2008	1981-2008	1981-2008	1981-2008
Dep = 1	1494	1277	963	661
Dep = 0	4805	4805	4805	4805

Table 9: Multinomial Logit Analysis of All Security Issues and Reductions (Passive Firms are the Base)

	Pure Debt Issues	**Issue Debt & repurchase Equity**	**Pure Equity Issues**	**Issue Equity & Retire Debt**	**Pure Debt Reductions**	**Pure Equity Repurchased**
CONST	-2.0219***	-3.8130***	-1.2450***	-1.9171***	-1.0888***	-2.3612***
	(0.0988)	(0.1708)	(0.0863)	(0.1225)	(0.0856)	(0.1112)
UNDVD	1.3377***	1.8689***	-0.9605***	-2.9475***	-1.4732***	0.7238***
	(0.0841)	(0.1520)	(0.0871)	(0.2646)	(0.0932)	(0.1042)
NDTS	-6.1374***	-4.4279*	1.4012	3.3021***	5.4366***	1.1594
	(1.7868)	(2.6495)	(0.9963)	(1.1296)	(1.0728)	(1.3391)
SIZE	-0.1362***	-0.1835***	-0.1171***	-0.1172***	0.0306	0.0368
	(0.0223)	(0.0361)	(0.0252)	(0.0348)	(0.0218)	(0.0349)
TANG	-1.5633***	-2.2254***	-0.9680***	-0.8387***	-0.7578***	0.2267
	(0.2130)	(0.3174)	(0.2644)	(0.3133)	(0.2133)	(0.2778)
ETR	-0.0717**	0.0165	-0.0833***	-0.0805***	-0.0562**	0.0112
	(0.0320)	(0.0465)	(0.0276)	(0.0294)	(0.0279)	(0.0327)
LEVERAGE	6.7653***	8.0703***	-0.2399	2.8581***	2.6277***	-0.5299
	(0.3319)	(0.3968)	(0.4365)	(0.4801)	(0.3369)	(0.5514)
INDL	0.4831	-4.6924	-0.0168	-0.4304	-3.8702	1.1823
	(2.6521)	(3.3574)	(2.7559)	(3.8569)	(2.5506)	(3.4127)
CAPEX	10.0492***	10.3052***	1.2884	-1.3115	-3.2599***	0.2115
	(0.8757)	(1.0576)	(0.9783)	(1.3534)	(1.0278)	(1.0430)
RD	-0.4277	1.6692	1.9510***	0.6737	0.4686	-0.8429
	(1.4470)	(1.4596)	(0.5303)	(0.9046)	(0.9941)	(0.9968)
RDD	0.0206	-0.2241	0.0839	0.1238	0.0428	-0.1069
	(0.0887)	(0.1451)	(0.0950)	(0.1374)	(0.0967)	(0.1168)
CASH	-3.8665***	-1.7800***	0.0539	-0.9838***	-2.7980***	0.8056***
	(0.4445)	(0.5229)	(0.2206)	(0.3580)	(0.3839)	(0.2799)
N	10077	10077	10077	10077	10077	10077
Pseudo R^2	0.1309	0.1309	0.1309	0.1309	0.1309	0.1309
Prob > Chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Period	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008	1981-2008
Dep = 1	1503	379	1287	449	971	663
Dep = 0	4825	4825	4825	4825	4825	4825