



CAPITAL STRUCTURE AND THE 2003 TAX CUTS

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KEYWORDS

Capital structure, tax rates, cost of capital.

ABSTRACT

The main purpose of this study is to determine if the 2003 tax cuts caused firms to change their capital structures. I find considerable evidence that a capital structure shift did occur. The median market debt ratio of the sample firms decreased from .078 in 2002 to .046 in 2006. After adjusting for known capital structure determinants like firm size and profitability, the data indicates that beginning shortly after the tax cuts were enacted firms began to shift their capital structures and by the end of 2003 they had, on average, about 4% more equity in their capital structures than expected. This increased to about 6% more equity than predicted in 2004 and remained at about the same level through 2006. The results indicate that no capital structure shift occurred immediately prior to the 2003 tax cuts as firms had, on average, the predicted amount of equity capital in their capital structures in 2002. It was also found that firms that did not pay dividends shifted their capital structures more than dividend payers and that the capital structure changes were facilitated by an increase in internally generated equity funds and by issuing equity and retiring debt.

1. INTRODUCTION

On May 28, 2003 when the Jobs and Growth Tax Relief Reconciliation Act of 2003 (the Act) was signed into law, the tax rates on dividend and capital gains income were reduced and made equal for tax payers in any tax bracket. Specifically, the tax rate on dividend income for tax payers in the top four tax brackets was reduced to 15%. It had been 38.6% for investors in the highest tax bracket. The tax rate on dividend income was reduced to 5% for tax payers in the bottom two tax brackets. Additionally, the tax rate on capital gains income was reduced from 20% to 15% for those in the top four tax brackets while the capital gains tax rate was reduced to 5% for those in the bottom two tax brackets. The reduction in the dividend tax rate was predicted to have a number of effects including a rise in the number of firms initiating dividends and an increase in the amount of dividends paid by firms that were already paying dividends. The tax cut was also predicted to cause a rise in the price of the stock of dividend paying firms, a reduction in the cost of capital of dividend paying firms, an increase in business investment and an increase in consumption expenditures and savings by those receiving dividend income (Brown, Liang and Weisbrenner (2007), Chetty and Saez (2005), Poterba (2004)). In a more formal analysis, Fosberg (2010) shows that in his model a decrease in the personal dividend tax rate will cause a dividend paying firm's share price to increase, the cost of equity capital to fall and the amount of debt (equity) in the firm's capital structure to fall (rise). Most of the above predictions are based on the assumption that a firm's marginal shareholder is not tax-exempt.

A number of authors have attempted to determine what the actual effects of the dividend tax cut were. Generally, the results of these empirical tests confirmed the predicted effects. Specifically, the major events in the passage of the Act were found to generate higher abnormal returns for

firms with higher dividend payouts while firms that did not pay dividends had higher abnormal returns than dividend payers (Auerbach and Hassett (2005, 2006) and Gadarowski, Meric, Welsh and Meric (2007)). Additionally, the number of firms initiating and raising dividends increased significantly following the passage of the Act (Brown, Liang and Weisbrenner (2007), Chetty and Saez (2005) and Julio and Ikenberry (2004)). Chetty and Saez found that the percentage of firms paying dividends increased from 20% to 25% with total dividend payments increasing by \$5 billion (20%). Share ownership by various groups was shown to be a significant determinant of which firms raised or initiated firms. Share ownership by executives, individuals and taxable institutional shareholders were shown to be positively correlated with the probability that a firm would increase or initiate dividends. Contradictory results were obtained for the effect of share ownership by tax-exempt institutions on the probability of a dividend increase or initiation (Brown, Liang and Weisbrenner (2007) and Chetty and Saez (2005)). Firms with a large independent shareholder on the board were also more likely to initiate dividends while having a large outside shareholder not on the board of directors had no effect on firm dividend payments (Chetty and Saez (2005)). Additionally, the probability of a dividend increase or initiation was shown to be inversely related to executive stock option ownership (Brown, Liang and Weisbrenner (2007), Chetty and Saez (2005)).

In this study, I seek to investigate an issue not addressed by the above authors. Did the 2003 tax cuts cause firms to adjust their capital structures to include more equity (less debt) capital? The results indicate that, on average, firms reduced (increased) the amount of debt (equity) in their capital structures following the 2003 tax cuts and maintained those capital structure adjustments through at least 2006. For example, the median market debt ratio of the sample firms decreased from .078 in 2002 to .046 in 2006. After adjusting for known capital structure determinants like firm size and profitability, the data indicates that beginning shortly after the tax cuts were enacted firms began to shift their capital structures and by the end of 2003 they had, on average, approximately 4% more equity in their capital structures than expected. This increased to about 6% more than predicted in 2004 and remained at about the same level through 2006. The results indicate that no capital structure shift occurred immediately prior to the 2003 tax cuts as firms had, on average, the predicted amount of equity capital in their capital structures in 2002. Further, it was found that firms that did not pay dividends shifted their capital structures more than firms that did. If the capital markets anticipated this, that could be a reason why non-dividend paying firms had higher abnormal returns around the events associated with the passage of the tax cuts than did dividend payers. Additionally, firms that increased their dividends after the tax cuts shifted their capital structures less than those that did not. The last two results suggest that the dividend payments inhibited the ability of firms to shift their capital structures. The capital structure shift was facilitated by an increase in net equity issuance and internally generated equity funds and the retirement of debt.

The organization of the rest of the paper is as follows. Section 1 contains a discussion of the sample selection procedures and summary statistics for selected variables. The main empirical analysis is presented in Section 2. A summary of results and conclusion are contained in Section 3.

2. SAMPLE SELECTION

For each year from 2001 through 2007 an initial sample of firms was taken from all firms listed on the current and research files of the COMPUSTAT data base. Firms in the financial services or utilities industries were excluded from all annual samples. To be included in the initial sample for a year a firm must have sufficient data available to calculate the firm's market and book debt ratios. A firm's market debt ratio (MDR) is defined to be book long-term debt divided by the market value of the firm. Firm market value is calculated as total assets less book common equity plus market common equity (common shares outstanding times share price). A firm's book debt ratio (BDR) is defined to be book long-term debt divided by total assets. This procedure yielded annual initial sample sizes ranging from 4,587 to 5,452 firms. Table 1 contains the mean and median values of the MDRs and BDRs for each sample year. The mean MDR drifts up slightly from 2001 to 2002 and then beginning in 2003 declines significantly through 2006 before ticking up in 2007. The major decreases in mean MDR occurred in 2003 and 2004 with the mean MDR dropping from .147 in 2002 to .119 in 2003 and declining further to .102 in 2004. From 2004 to 2006 the mean MDR was relatively stable. Although the yearly median MDRs are smaller than the corresponding mean MDRs, the same general pattern of declining MDRs is apparent in the medians. The median MDRs decline from .078 in 2002 to .058 in 2003 to .047 in 2004 and remain relatively stable through 2007. A similar but weaker pattern of declining debt ratios is observed when capital structure is measured by book debt ratios. The mean BDR declines from .169 in 2002 to .151 in 2004 while the median BDR falls from .109 to .091 over the same time period. The significantly larger values of the means as compared to the medians for both debt ratio measures indicates the presence of a significant number of sample firms with large amounts of debt in their capital structures. This issue will be addressed later. Overall, these initial results are consistent with the prediction that firms would react to the 2003 tax reductions by decreasing (increasing) the amount of debt (equity) in their capital structures.

3. EMPIRICAL ANALYSIS

Numerous studies have shown that certain variables, like firm size and profitability, affect the amount of debt a firm employs in its capital structure. In the next part of the empirical analysis I incorporate these variables into the analysis in order to control for the effects of these variables on firm capital structure. The set of control variables used in this analysis is similar to that used by Fama and French (2002) and Flannery and Rangan (2006). As larger firms have been found to employ more debt in their capital structures, the natural log of total assets (Assets) is used as a size proxy. The profitability measure used is earnings before interest and taxes divided by total assets (EBIT). Firm profits have been shown to be inversely related to the amount of debt capital a firm employs. Net property, plant and equipment divided by total assets (PPE) is used to proxy for the amount of tangible assets that a firm has. More tangible assets are associated with a greater use of debt financing. Depreciation and amortization divided by total assets (Depr) is used to measure the quantity of non-debt tax shields the firm has available. Non-debt tax shields are inversely correlated with the amount of debt in a firm's capital structure. The market to book ratio (M/B) is used to capture company investment opportunities. The market to book ratio is calculated as total assets less book value of common equity plus market value of common equity divided by total assets. Firms with more investment opportunities generally employ less debt in their capital structures. Assets uniqueness is measured by research and development expense divided by total assets (R&D). The more unique a firm's assets the less debt they usually have in their capital structures.

We initially estimate the effects of the control variables on firm capital structure by regressing the MDRs of the sample firms in year t on the one year lagged values of the control variables for the sample firms (equation 1). Lagged values are used to mitigate any endogeneity problems associated with the variables. The coefficients from equation 1 are estimated using MDR data from 2001 and 2002.

$$MDR_{i,t} = a_1 + a_2 Assets_{i,t-1} + a_3 EBIT_{i,t-1} + a_4 PPE_{i,t-1} + a_5 Depr_{i,t-1} + a_6 M/B_{i,t-1} + a_7 R\&D_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

To obtain a predicted MDR for firm i in year t, the coefficient estimates from equation 1 are multiplied by the one year lagged values of the control variables for firm i. The predicted MDR for firm i in year t is subtracted from the actual MDR for firm i in year t to yield a capital structure deviation (CSD) for each firm in each sample year (equation 2).

$$CSD_{i,t} = Actual\ MDR_{i,t} - Predicted\ MDR_{i,t} \quad (2)$$

If the CSD is positive (negative), the firm has more (less) than the predicted amount of debt (equity) in its capital structure. If the 2003 tax cuts induced firms to increase the amount of equity in their capital structures their CSDs should be negative beginning in 2003.

3.1. Actual versus Predicted Capital Structures

Table 2 presents the mean capital structure deviations for the sample firms for years 2003 through 2007. Column one reports the deviations for the full of sample firms for which sufficient data was available to do the requisite calculations. The mean deviation of -.028 for 2003 indicates that, on average, the sample firms had 2.8% less debt in their capital structures than predicted for 2003. That deviation, as well as all the others reported in Table 2, is significant at the 1% level. This suggests that even though the tax cuts did not become law until May 28, 2003, by the end of 2003 firms had already begun to significantly increase the amount of equity in their capital structures. The capital structure adjustments continued into 2004 as well as, on average, firms had 4.1% less than the predicted amount of debt in their capital structures in 2004. The capital structure deviations increased by another .2% in both 2005 and 2006 before decreasing by 1.1% in 2007. One possible explanation for the 2007 trend reversal is that the Democrats took control of control Congress in January 2007 and promised to end some of the 2003 tax cuts. Firms may have begun adjusting to the anticipated tax increases by reversing their previous capital structure adjustments. Another possible explanation is that the financial market turmoil occurring in 2007 made it impossible or in advisable for firms to maintain their 2006 capital structures. Which, if any, of these theories accounts for the decline in the mean CSD in 2007 requires more data than is currently available and will not be attempted here. In sum, the results from column 1 of Table 2 are generally consistent with the predictions previously discussed. Specifically, firms began reducing (increasing) the amount of debt (equity) in their capital structures shortly after the passage of the 2003 tax cuts and continued those adjustments into 2004. By the end of 2004 the capital structure adjustments were largely complete and were maintained through at least 2006.

The results from Table 1 and the inspection of the sample data indicate that there are a significant number of sample firms with large amounts of debt in their capital structures. These high debt firms could be biasing the results in at least two ways. If high debt firms have a strong preference for large amounts of debt in their capital structures they would be unlikely to make significant reductions in their debt even in the presence of the tax cuts. This would cause the reported results to underestimate the effect of the 2003 tax cuts. On the other hand, high debt firms may find elevated debt levels undesirable and would try to reduce their debt levels even without the tax cuts. This would tend to cause the reported results to overestimate the effect of the tax cuts. To investigate this issue the one percent of firms with the highest MDRs in each year were trimmed from the sample and the analysis was repeated. The results of this analysis are presented in column 2 (MDR 1% Tr). The results with the high debt firms eliminated are almost identical to the results with the full sample of firms. Evidently, the presence of high debt firms is not significantly biasing the reported results. Another possible source of bias comes from including firms with very high losses in the sample. These firms are not likely to have the same access to the equity markets that profitable firms would have and, therefore, may not be able to significantly increase the amount of equity in their capital structures even though they desired to do so. This would tend to cause the reported results to underestimate the capital structure adjustments that firms actually made. To adjust for this potential source of bias, in each year firms with EBIT that is less than or equal to $-.5$ (losses are 50% or more of total assets) are eliminated from the sample and the analysis is repeated. The one percent of firms with the highest MDRs in each year are also eliminated. The results of this analysis are contained in column 3 (EBIT $> -.5$). As expected, the elimination of the high loss firms from the analysis increases the magnitude of the capital structure adjustments found for the sample firms. Specifically, the means values of the capital structure deviations increases (in absolute value) by .3% to .4% in each of the sample years.

Another source of bias could come from including firms with little or no debt in their capital structures in the analysis. Even if the tax cuts would have caused these firms to desire to decrease the amount of debt in their capital structures, their paucity of debt would have allowed little or no reduction in their observed debt ratios. This bias would cause the reported results to underestimate the effect of the tax cuts. To investigate this issue, I begin by eliminating from the annual samples all firms with an MDR of .03 or less (3% or less debt in their capital structure). Firms with high debt ratios and large losses are also removed from the sample. The results of the analysis are presented in column 4 (MDR $> .03$). The removal of the low debt firms caused the average CSD to increase in each year from 2003 through 2006. The mean CSD increased by 1.2% in 2003 and 1.4% in 2004. Thus, by the end of 2004, on average, the sample firms had 5.8% less debt (more equity) in their capital structures than expected. Removing firms with five percent or less debt in their capital structures had little effect on the average CSD (see column 5 (MDR $> .05$)). Only including firms with MDRs greater than .10 significantly reduced both the sample size and the average CSD (not reported). These results indicate that including low debt firms in the analysis will result in a significant underestimation of the effect of the tax cuts on firm capital structure.

Table 3 contains the results of a similar analysis conducted using BDRs as the leverage measure. In this analysis, the book debt ratio of firm i in year t ($BDR_{i,t}$) is used as the dependent variable in equation 1. The coefficients of the variables in equation 1 are estimated using BDR data from 2001 and 2002 along with the lagged values of the control variables. The estimated coefficients along with the actual lagged values of the controls variables for each firm in each year are then used determine a predicted CSD for each firm in each year. The CSD for firm i in year t is calculated as the actual $BDR_{i,t}$ less predicted $BDR_{i,t}$. With the full sample of firms (column 1), the mean CSDs begin at $-.9\%$ in 2003, increase to -2.1% in 2005 before declining in 2007. All the CSDs reported in Table 3 are significant at the 1% level. These results are similar to those

obtained using MDRs except that the values of the deviations are one third to one half the size. When the one percent of firms with the highest BDRs in each year are trimmed (BDR 1% Tr) the results remain virtually unchanged (column 2). A slight increase in mean CSD results when firms with large losses are eliminated from the sample (column 3). Eliminating firms with little or no debt in their capital structures does not significantly affect the results (columns 4 and 5). In sum, the results obtained using BDRs confirm that the 2003 tax cuts did result in firms using less debt (more equity) in their capital structures.

3.2. Regressions with Panel Data

Next, an analysis is conducted on the sample firms in which all the sample data (from years 2001 through 2007) is used in a single regression with yearly dummy variables added to equation 1 to measure the annual CSDs. The dummy variables D02 through D07 are set equal to one if the MDR data is from the specified year and zero, otherwise. For example, D02 is set equal to 1 if the MDR data is from 2002 and zero otherwise. This methodology offers several advantages over the previous technique. First, by using all the sample data in a single regression, better estimates of the coefficients of the control variables should be obtained. Second, if the relationship between the control variables and firm capital structure has changed during the sample period this should be reflected in the estimates of the coefficients of the control variables. And lastly, the coefficient of the 2002 dummy variable will indicate whether the capital structure changes previously reported began prior to the 2003 tax cuts. The results of this analysis using MDRs as the leverage measure, are contained in Table 4. With the full sample of firms, all of the control variables except one have the expected sign and most are significant at the 5% level or better. The coefficients of the annual dummy variables capture the deviation of the actual MDR from the predicted MDR and are equivalent to the previously defined CSDs. A negative coefficient indicates that the firm has less (more) than the predicted amount of debt (equity) in its capital structure. The coefficient of D02 (.002) is positive, small and insignificant suggesting that in 2002 the control variables, on average, accurately predict a firm's capital structure. That is, there is no tendency in 2002 for firms to have more or less than the predicted amount of debt in their capital structure. For 2003, the dummy variable coefficient (-.028) is much larger (in absolute value), negative and significant at the 1% level. The dummy variable coefficient rises to -.042 in 2004 and continues drifting higher through 2006 before falling in 2007. The dummy variable coefficients for 2004 through 2007 are significant at the 1% level. Thus, by 2006 the sample firms have, on average, 4.6% less debt (more equity) in their capital structures than predicted by the control variables. The dummy variable coefficients for 2003 through 2007 in all subsequent regressions reported in Table 4 are significant at the 1% level.

Removing the one percent of firms in each year with the highest MDRs has little effect on the values or significance levels of the coefficients of either the control variables or annual dummy variables (column 2). The coefficient of D02 remains small and insignificant while the coefficients of the other annual dummy variables remain reliably negative. If high debt and large loss firms are removed from the sample the coefficients of the control variables all take on their predicted signs and are significant at the 5% level or better (column 3). The coefficient of the 2002 dummy variable remains small and insignificant while the coefficients of the other annual dummies rise by .2% to .3% and maintain their significance levels. If firms with 3% or less debt in their capital structures are also eliminated from the sample the coefficient of the 2002 dummy variable remains small and insignificant while the coefficients of the other annual dummy variables increase by 1.1% to 1.4% (column 4). This confirms the previous finding that including firms with little or no debt in their capital structure in the sample of firms causes empirical tests to

underestimate the effect of the tax cuts on firm capital structure. If firms with 5% or less debt are excluded from the sample the results are little changed (column 5). Assuming the results obtained when the high debt, low debt and large loss firms are eliminated from the sample are the most representative of the effects of the 2003 tax cuts, then clearly the tax cuts resulted in significant numbers of firms using less debt (more equity) in their capital structures. Specifically, by the end of 2003 firms had, on average, 4.3% less debt in their capital structures than expected and by 2004 this had risen to 5.8% less debt. Also, the insignificance of the coefficient of the 2002 dummy variable in all regressions strongly indicates that the capital structure adjustments noted above did not begin prior to the tax cuts. Overall, the results from Table 4 are almost identical to those reported in the corresponding columns of Table 2 and suggest that the findings reported here are robust with respect to the methodology used to measure capital structure shifts. Additionally, since the results in Table 2 were calculated using two years (2001 and 2002) of sample data to estimate the control variable coefficients while those contained in Table 4 were calculated using seven years (2001 through 2007) of data, this suggests that there was no significant shift in the relationship between firm capital structure and the control variables during the sample time period.

An analysis identical to that performed in Table 4 was also conducted using BDRs. The results of that analysis (not reported) are very similar to those reported in Table 3. As the MDR is the theoretically preferred capital structure measure, it will be the capital structure measure used in all subsequent empirical analyses. Additionally, to remove the effects of various sources of bias on the empirical results, the base sample of firms for all further analyses will exclude high debt, low debt and large loss firms.

One of the more interesting empirical results associated with the 2003 tax cuts is that firms that paid no dividends had higher abnormal returns during the period surrounding the passage of the tax cuts than dividend paying firms. This was somewhat unexpected since the dividend income tax rate cut was much larger than the capital gains tax rate cut for middle and upper income investors. One possible explanation for this is that dividend paying firms were paying out part of their internally generated equity funds as dividends and therefore had less internally generated equity available to increase (reduce) the amount of equity (debt) in their capital structure in response to the tax cuts. Conversely, firms that paid no dividends had more internally generated equity available and were better able to shift the amount of equity in their capital structure to the new optimal level implied by the tax cuts. A greater shift in capital structure should result in a greater reduction in the firm's average cost of capital and, if this was anticipated by the capital market, a greater increase in stock price (higher abnormal returns) around the passage of the tax cuts for firms that did not pay dividends. To test this theory the sample firms were divided into two groups, those that paid dividends in the fourth quarter of 2002 and those that did not. A regression like that employed in Table 4 was then run on each subgroup of firms. The results of these regressions are reported in the first two columns of Table 5. To conserve space the coefficients of the control variables are not reported. For both the payer and non-payer subgroup the coefficient on the 2002 dummy variable is small and insignificant. However, for each of the other annual dummy variables the coefficient of the non-payer subgroup is much higher than that of the dividend payer subgroup. For 2003, the non-payers coefficient is -.047 versus -.031 for the dividend payers. The difference in the coefficients is significant at the 5% level ($t = 2.11$). Similarly, for 2006 the coefficient is -.069 for the non-payers and -.044 for the payers. The difference in the coefficients is significant at the 1% level ($t = 3.42$). These results indicate that, on average, non-payers did adjust their capital structures more (added more equity capital) than dividend payers in the years following the tax cuts.

The above results suggest that the payment of dividends reduces the ability of a firm to adjust its capital structure in response to the 2003 tax cuts. I further investigate this issue by testing whether firms that raised their dividends following the tax cuts adjusted their capital structures to the same degree as firms that didn't increase their dividends. The previous results imply that firms that increased their dividends should not have adjusted their capital structure as much as firms that did not. To test this prediction the sample firms were divided into two subgroups, those that increased their dividends in 2003 and those that did not. Capital structure regressions like those used to produce the results in Table 4 were run on each subgroup of firms. The results are reported in the last two columns of Table 5. For both subgroups, the coefficient of the 2002 dummy is again small and insignificant. For the annual dummy variables for years 2003 through 2007, the coefficients for the no dividend increase subgroup are larger in each year than for the dividend increase subgroup. This difference is small in 2003 (.003) but increases over time until the difference in coefficient values reaches .030 in 2006. The difference in the 2006 coefficients is significant at the 1% level ($t = 3.55$). These results imply that firms that increased their dividends as a result of the tax cuts had less internally generated equity capital available to shift their capital structures than firms that did not.

3.3. Sources of Capital Structure Changes

Next, an investigation of how the capital structure changes were implemented was conducted. The means firms have of increasing the amount of equity in their capital structure include retaining more internally generated equity funds, issuing more equity securities, and/or retiring debt. Looking first at the issuance of equity, the net equity issuance to total assets ratio was calculated for each firm in the 2006 sample. The 2006 sample was chosen because that is the year in which the capital structure changes reached their peak. Net equity issuance is calculated as the value of common and preferred shares issued less the value of common and preferred shares repurchased. Column 1 of Table 6 contains the median values of net equity issuance. Net equity issuance almost doubled from a median of .030% of assets in 2002 to .056% in 2003. In 2004, median net equity issuance increased nearly fourfold to .215% of assets. Net equity issuance remained above the pre-tax cut (2002) level through 2006. The percentage of firms that were net equity issuers also increased significantly after the tax cuts, rising from 54% in 2002 to 62% in 2004. The percentage of equity issuers was higher in every year after the tax cuts (2003 through 2006) than before (2002). Looking next at the internally generated equity funds to total assets ratio (IGEF), it is apparent that an increase in internally generated equity funds also contributed to the increase in the amount of equity capital in the sample firms' capital structures (column 2). Internally generated equity funds is calculated as EBITDA less interest expense, income taxes and preferred and common dividends. The median IGEF ratio increased from 7.2% in 2002 to a peak of 9.1% in 2004 and remained above pre-tax cut levels through 2006. To ascertain if debt retirement played a role in the capital structure shift the net debt change to total assets ratio (D. Chg.) was calculated for each firm. Net debt change is the value of new borrowings less the value of debt retired. The median values of the sample firms' net debt change ratio are presented in column 3. On average, the sample firms retired debt in each year from 2003 through 2005, with the largest debt retirement occurring in 2003 (.24% of assets) and decreasing thereafter. Additionally, debt retirement seems to have played, on average, almost as large a role in a firm's capital structure shift as equity issuance. In sum, firms implemented (on average) the shift to less debt (more equity) in their capital structures by a combination of issuing more equity, generating more internal equity funds and paying off debt.

4. CONCLUSION

One of the predicted effects of the 2003 tax cuts was that the reduced cost of equity capital for firms that resulted from the cut in the personal dividend and capital gains tax rates would lead companies to increase the amount of equity in their capital structures. I find considerable evidence that such a capital structure shift did occur. The median market debt ratio of the sample firms decreased from .078 in 2002 to .046 in 2006. After adjusting for known capital structure determinants like firm size and profitability, the data indicates that beginning shortly after the tax cuts were enacted firms began to shift their capital structures and by the end of 2003 they had, on average, about 4% more equity in their capital structures than expected. This increased to about 6% more than predicted in 2004 and remained at about the same level through 2006. The results indicate that no capital structure shift occurred immediately prior to the 2003 tax cuts as firms had, on average, the predicted amount of equity capital in their capital structures in 2002. Further, it was found that firms that did not pay dividends increased the amount of equity in their capital structures more than dividend paying firms that did. Additionally, firms that increased their dividends after the tax cuts shifted their capital structures less than those that did not. The last two results suggest that the dividend payments inhibited the ability of firms to shift their capital structures. The capital structure shift was facilitated by an increase in net equity issuance and internally generated equity funds and the retirement of debt.

Table 1: Firm Debt Ratios

A firm’s market debt ratio (MDR) is defined to be book long-term debt divided by the market value of the firm. Firm market value is calculated as total assets less book common equity plus market common equity (common shares outstanding times share price). A firm’s book debt ratio (BDR) is defined to be book long-term debt divided by total assets.

	MDR		MDR	
	Mean	Median	Mean	Median
		Meant		Mean
2001	.142	.067	.172	.107
2002	.147	.078	.169	.109
2003	.119	.058	.164	.108
2004	.102	.047	.151	.091
2005	.100	.047	.151	.090
2006	.100	.046	.153	.093
2007	.111	.049	.160	.098

Table 2: Market Debt Ratio Changes after the 2003 Tax Cuts

The numbers in the body of the table are the means of the sample firms' capital structure deviations (CSDs). $CSD_{i,t} = Actual\ MDR_{i,t} - Predicted\ MDR_{i,t}$. A firm's market debt ratio (MDR) is defined to be book long-term debt divided by the market value of the firm. Firm market value is calculated as total assets less book common equity plus market common equity (common shares outstanding times share price). EBIT is the firm's earnings before interest and taxes divided by total assets ratio. The numbers in parentheses are t-values.

	CSD				
	Full	MDR 1% Tr	EBIT > -.5	MDR >.03	MDR >.05
2003	-.028** (14.7)	-.028** (15.4)	-.031** (16.4)	-.043** (17.9)	-.044** (17.7)
2004	-.041** (22.1)	-.040** (23.5)	-.044** (25.7)	-.058** (26.9)	-.059** (26.7)
2005	-.043** (18.3)	-.043** (19.6)	-.048** (27.8)	-.058** (25.9)	-.058** (25.0)
2006	-.045** (22.6)	-.045** (24.4)	-.048** (27.6)	-.058** (26.2)	-.059** (25.5)
2007	-.034** (16.6)	-.035** (18.1)	-.038** (19.5)	-.039** (15.4)	-.037** (14.2)

* and ** represent significance at the 5% and 1% levels, respectively.

Table 3: Book Debt Ratio Changes after the 2003 Tax Cuts

The numbers in the body of the table are the means of the sample firms' capital structure deviations (CSDs). $CSD_{i,t} = Actual\ BDR_{i,t} - Predicted\ BDR_{i,t}$. A firm's book debt ratio (BDR) is defined to be book long-term debt divided by total assets. EBIT is the firm's earnings before interest and taxes divided by total assets ratio. The numbers in parentheses are t-values.

	CSD				
	Full	BDR 1% Tr	EBIT > -.5	BDR >.03	BDR >.05
2003	-.009** (3.72)	-.009** (3.90)	-.010** (4.44)	-.010** (3.58)	-.020** (3.51)
2004	-.018** (7.94)	-.018** (8.28)	-.020** (9.11)	-.021** (7.22)	-.021** (7.29)
2005	-.021** (8.40)	-.022** (9.25)	-.026** (11.2)	-.025** (8.73)	-.026** (9.06)
2006	-.020** (8.46)	-.020** (8.87)	-.023** (9.63)	-.020** (6.96)	-.022** (7.39)
2007	-.014** (5.51)	-.014** (5.68)	-.016** (6.42)	-.009** (2.88)	-.008** (2.77)

* and ** represent significance at the 5% and 1% levels, respectively.

Table 4: Regression Analysis of Market Debt Ratio Changes

A firm's market debt ratio (MDR) is defined to be book long-term debt divided by the market value of the firm. Firm market value is calculated as total assets less book common equity plus market common equity (common shares outstanding times share price). EBIT is the firm's earnings before interest and taxes divided by total assets ratio. Assets is the natural log of total assets. EBIT is the earnings before interest and taxes to total assets ratio. PPE is the net property, plant and equipment to total assets ratio. Depr is the depreciation and amortization expense to total assets ratio. M/B is the firm market value to book value ratio. R&D is the research and development expense to total assets ratio. D02 through D07 are the annual dummy variables for years 2002 through 2007. They take a value of one in the indicated year and zero, otherwise. The numbers in parentheses are t-values.

	Full	MDR 1% Tr	EBIT > -.5	MDR >.03	MDR >.05
Inter	-.024** (8.93)	-.023** (9.19)	-.054** (11.9)	-.250** (48.5)	-.278** (51.1)
Assets	.014** (45.8)	-.014** (49.0)	-.013** (37.5)	-.003** (6.65)	-.001** (2.61)
EBIT	-.001* (2.41)	-.007* (2.24)	-.083** (10.0)	-.147** (15.0)	-.162** (15.6)
PPE	.190** (47.6)	-.172** (48.0)	-.161** (28.5)	-.098** (20.4)	-.088** (18.2)
Depr	-.005 (1.72)	-.003 (1.21)	-.081** (3.59)	-.195** (6.88)	-.192** (6.61)
M/B	-.000 (1.40)	.000 (1.66)	-.002* (2.20)	-0.24** (11.2)	-.024** (10.0)
R&D	.010* (1.40)	-.008* (2.35)	-.252** (6.46)	-.307** (13.4)	-.312** (13.2)

Table 4 continued

D02	.002 (0.58)	.002 (0.74)	.002 (0.48)	-.001 (0.22)	-.001 (0.36)
D03	-.028** (9.36)	-.027** (9.64)	-.029** (9.69)	-.043** (11.6)	-.045** (11.7)
D04	-.042** (14.8)	-.041** (15.5)	-.044** (15.7)	-.058** (16.3)	-.060** (16.4)
D05	-.045** (15.7)	-.044** (16.5)	-.047** (16.9)	-.058** (16.0)	-.059** (15.8)
D06	-.046** (15.9)	-.045** (16.7)	-.048** (16.9)	-.059** (16.1)	-.060** (15.9)
D07	-.035** (11.7)	-.035** (12.4)	-.038** (12.6)	-.039** (10.1)	-.038** (9.55)
N	32,896	32,568	30,107	17,844	16,295
Adj. R ²	.19	.19	.21	.16	.15

* and ** represent significance at the 5% and 1% levels, respectively.

Table 5: Dividends and Market Debt Ratio Changes

The control variables are the variables on the right hand side of equation 1. D02 through D07 are the annual dummy variables for years 2002 through 2007. They take a value of one in the indicated year and zero otherwise. The numbers in parentheses are t-values.

	<u>Dividend Payer</u>		<u>Dividend Increase</u>	
	Yes	No	Yes	No
Inter.	.253 (26.0)	.234 (40.0)	.274** (21.9)	.235** (41.2)
Control Variables	Yes	Yes	Yes	Yes
D02	-.002 (0.38)	.001 (0.17)	-.004 (0.54)	.002 (0.36)
D03	-.031 (5.33)	-.047 (10.4)	-.040** (5.51)	-.043** (10.2)
D04	-.047 (8.38)	-.061 (14.2)	-.046** (6.64)	-.058** (14.3)
D05	-.043 (7.49)	-.064 (14.6)	-.038** (5.26)	-.061** (14.7)
D06	-.044 (7.66)	-.069 (15.7)	-.036** (5.00)	-.066** (15.8)
D07	-.029 (4.76)	-.050 (10.5)	-.021** (2.64)	-.047** (10.5)
N	4,278	12,768	2,510	13,988
Adj. R ²	.21	.17	.26	.16

* and ** represent significance at the 5% and 1% levels, respectively.

Table 6: Sources of the Capital Structure Changes

St. Iss. is the net equity issuance to total assets ratio. IGEF is the internally generated equity funds to total assets ratio. D. Chg. is the net debt change to total assets ratio. %+ is the percentage of sample firms with a positive value for St. Iss.

	St. Iss.	IGEF	D. Chg.
2001	.00018	.07303	.00000
%+	52		
2002	.00030	.07212	-.00355
	54		
2003	.00056	.07753	-.00241
	56		
2004	.00215	.09055	-.00079
	62		
2005	.00135	.08488	-.00020
	59		
2006	.00076	.08515	.00000
	57		

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