Looking Under the Lamppost:
An Empirical Examination of the Determinants of Capital Structure[*]

Michael L. Lemmon
Eccles School of Business
University of Utah

Jaime F. Zender
Eller College of Business
University of Arizona

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Abstract

The determinants of capital structure for a broad cross section of firms are considered by focusing on a comparison of firms sorted by the level of their unused tax benefits of debt financing. We document that a large fraction of firms appear to be very conservatively financed and forego significant tax benefits associated with debt financing. We find little support for either the tradeoff theory or the pecking order theory as explaining observed capital structure choices. There is mixed evidence regarding managerial entrenchment. Firms with the largest amount of unused debt capacity are less likely to be acquisition targets, but levels of insider ownership and rates of CEO turnover are similar to those in more highly levered firms.

Introduction

It has long been recognized that the corporate tax laws in the United States provide a powerful motivation for the use of debt in financing U.S. corporations. Perhaps the most colorful representation of the importance of this benefit to the use of debt financing came in the form of Miller's (1977) analogy to the "horse and rabbit stew." DeAngelo and Masulis (1980) argue that the marginal tax benefits of debt will vary across firms operating in different markets and for firms that own different types of real assets. In this study we exploit cross sectional differences in firms' tax benefits to the use of debt financing to examine the determinants of capital structure and to consider the empirical validity of the predominant theories that have been proposed to explain capital structure choices.

Graham (1996) provides calculations for a firm's expected marginal tax rate, taking into account the expected growth and volatility of earnings for the firm as well as the use of both debt and non-debt tax shields. Based upon this work it is possible to estimate both a firm's current marginal benefit for the use of debt financing and its entire marginal benefit curve. A variable labeled "kink" by Graham (2000) indicates the extent to which a firm can increase its existing leverage before the marginal expected tax benefit of debt financing begins to decrease and so provides a direct measure of the relative level of conservatism of the firm's capital structure.

We use this measure of financial conservatism to examine the determinants of capital structure by comparing firms that follow very conservative debt policies to those with (relatively) more aggressive capital structures. Specifically, we compare the firms in the top quartile of values of kink (conservatively financed or "high kink" firms) with those in the bottom three quartiles

(aggressively financed or "low kink" firms).[1]

The benefit of this approach is illustrated most transparently by considering the tradeoff theory of optimal capital structure. Under the null hypothesis that firms follow the tradeoff theory they act to equate the marginal costs and benefits of debt. Firms that follow conservative debt policies, and thus have extremely high benefits to the additional use of debt financing, will also have extremely high marginal costs of debt.[2] By comparing conservatively financed firms to firms that use debt more aggressively we therefore search "where the light is brightest."

Comparisons of the levels of (standard proxy variables for) the costs of debt financing provide little support for the notion that the conservatively financed firms face high costs of debt financing. The firms with largest unused tax benefits of debt financing are, on average, more profitable, have higher holdings of cash and liquid assets, higher dividend payout ratios, less volatile earnings, higher levels of excess annual cash flow (before interest and depreciation but after dividends and capital expenditures), lower probabilities of bankruptcy, and similar levels of asymmetric information compared to firms with more aggressive capital structures. Thus, even when focusing on those firms for which the costs of debt financing should be extreme, we find little evidence that the static tradeoff theory has the ability to explain differences in the use of debt financing for the cross-section of firms in our sample.

We next consider the pecking order theory. Our examination of the tradeoff theory

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[1]We are limited to the set of firms for which kink can be calculated. For our sample period, 1980-1995 this includes, on average, over 90% of firms listed on compustat. We further restrict the sample to firms with total assets greater than $50 million and sales greater than $5 million.

[2]The importance of the innovation introduced by Graham (2000) can be seen by noting that the tax code implies that the marginal benefit curve will be essentially flat (at the maximum statutory corporate tax rate) for almost all firms after their taxable income reaches a certain level. Measuring a firm's marginal tax rate does not, for firms with the top tax rate, uniquely identify the location of a theoretical marginal cost curve.

demonstrates that separating the sample into firms with conservative and aggressive capital structures will also add power to tests of the pecking order theory. In addition to being highly profitable, conservatively financed firms also have the largest amounts of financial slack as measured by their reservoirs of cash and liquid assets. While this would seem to provide some superficial evidence consistent with financing decisions being based on the pecking order hypothesis, it also illustrates that if the pecking order theory is a valid description of how firms' capital structures evolve, then the conservatively financed firms should exhibit pecking order behavior most clearly. Specifically, these firms should deplete their reservoirs of internal funds before raising capital in the external markets, and should overwhelmingly favor debt financing when they do seek outside financing.

The evidence, however, shows that while, overall, the reduction of financial slack is an important variable in determining the likelihood that all firms go to the public markets for financing, conservatively financed firms have stable or rising cash balances in the two years prior to an issue of new securities and these balances are maintained for two years after the issue. The conservatively financed firms are also no less likely to issue new equity than are the more aggressively financed firms when they seek outside financing. Finally, event study analysis shows that the (negative) price reactions to announcements of new equity issues are similar across the two groups of firms. This confirms earlier findings that indicate both types of firms face similar levels of information asymmetry.

We also do not find support for the hypothesis that the maintenance of financial flexibility accounts for the nature of the capital structures chosen by the conservatively financed firms. Our results indicate that capital expenditures of conservatively financed firms are more sensitive to

changes in current cash flow compared to those of firms with more aggressive capital structures. The analysis suggests that conservatively financed firms actually face smaller costs to delaying or reducing investment when internal cash flow is insufficient to support investment levels.

Lastly, we provide some preliminary evidence on whether conflicts of interest between managers and shareholders can explain the conservative financial policies we document. Consistent with the entrenchment hypothesis, we do find that conservatively financed firms are significantly less likely to become takeover targets compared to more aggressively financed firms and that they have somewhat lower levels of insider ownership and slightly lower rates of (both voluntary and forced) CEO turnover. Additionally, we find some evidence that leverage increases more in conservatively financed firms (as compared to the more aggressively financed firms) following forced CEO departures and unsuccessful tender offers.

Recently, several papers have sought to test the tradeoff theory and the pecking order theory as competing explanations for observed capital structures. Fama and French (2000) examinine how firms' profitability and investment opportunity sets correlate with capital structure and dividend policy choices. They find some evidence consistent with both pecking order and tradeoff theories and some that contradicts each. Shyam-Sunder and Myers (1999) find that the pecking order theory explains more of the time series variation in debt ratios than does a simple target adjustment model based on the tradeoff theory. Frank and Goyal (2000) find none of the pecking order theories predictions to hold in the data but find evidence of mean reversion in leverage ratios for a broad cross section of firms which they interpret as being consistent with the tradeoff theory.

Our paper is most closely related to the work of Graham (2000) and Minton and Wruck (2000). Graham considers the value of the tax benefits of debt financing for U.S. corporations, and

develops the estimates of the marginal tax benefit to debt financing curves and introduces the variable "kink." He notes that many firms seem to use conservative capital structures and that the standard measures of costs of debt financing don't seem to offer an explanation for this conservatism. Our analysis uses Graham's estimates of "kink" to provide additional evidence on the determinants of capital structure and to test the competing theories. Minton and Wruck examine the financial policies of low debt firms. Similar to our results they find that conservative firms stockpile cash and debt capacity. In contrast to our results, they find evidence that low debt firms appear to follow a pecking order style financial policy (although they also note that financially conservative firms in their sample do not literally follow the pecking order). Their identification of financial conservatism is very different from ours, however, in that they focus on firms with low leverage, while our measure of conservatism focuses directly on the foregone tax benefits of debt. The Spearman rank correlation between kink and the leverage ratio is only 0.27, indicating that the two measures of financial conservatism contain significantly different information.

The remainder of the paper is organized as follows. Section 1 describes the data. Section 2 discusses our measure of financial conservatism, and Section 3 discusses the various capital structure theories we examine and presents our empirical results. Section 4 concludes with a brief discussion of our findings.

1. Data

We begin with data from all firms in the intersection between Compustat and CRSP with average book assets greater than or equal to $50 million and average sales greater than or equal to

$5 million over the period 1980 to 1995.[3] To be included in a given year, firms must have nonmissing data on total assets (Compustat data #6), long-term debt (Compustat data #12), short-term debt (Compustat data #34), Operating income (Compustat data #13), and capital expenditures (Compustat data #128). We eliminate regulated firms (SICs 4900-4999) and financial firms (SICs 6000-6999). We augment this data with stock return data from CRSP. From Securities Data Corporation (SDC) we obtain data on all securities issues by our sample firms and whether the firm is a target of an acquisition attempt. Finally, we obtain data on the ownership of officers and directors for all firms in our sample that are also covered on Compact Disclosure over the years 1989-1995, and data on CEO turnover for the subsample of our firms that are also covered in Husson, Parrino, and Starks (2000) over the period 1980-1995. Definitions of the various variables used in our empirical analysis are provided in appendix A.

2. Identifying Financial Conservatism

For this sample of firms we obtain measures of "kink" from Graham (2000). Graham computes kink for approximately 90% of all Compustat firms. Kink measures the relative amount by which a firm could increase its current interest expense before the marginal tax benefit of debt financing begins to decline. For example, a firm with a kink value of two could double its interest expense before it *begins* to see a reduction in the tax benefits associated with debt financing. Graham assigns firms a kink value between zero and nine. Firms with a kink value of zero are those that are already operating on the downward sloping portion of the marginal tax benefit function.

[3]Our results are not sensitive to these size screens. We employ these screens to ensure that our results are not driven by small firms with extreme debt ratios.

For each year from 1980-1995 we rank firms according to the level of kink and place firms into two groups. Firms in the top quartile of values of kink are labeled "high kink" or "conservatively financed" firms since these firms could substantially increase their current interest expense without losing any tax benefits associated with debt financing. Firms in the bottom three quartiles are labeled "low kink" or "aggressively financed firms". The low kink group contains an average of 1,487 firms per year, and the high kink group contains an average of 484 firms per year. The kink variable is missing for about 200 firms each year.

Various measures of the potential foregone benefits to the use of debt financing for the two groups are presented in Table 1. We compare the means and medians of the level of the variable kink, the debt to book assets ratio, interest coverage ratios, taxes paid relative to the book value of assets, dividends paid relative to book assets , and a proxy for the effective personal marginal tax rate on equity relative to that on debt for the two groups of firms. To assess statistical significance, we report the average p-values across years from Anova and Wilcoxon sign rank tests of differences across the two groups as well as the percentage of years in which the test statistics are significant at the 0.10 level or better. Not surprisingly, there are large differences for these measures of the foregone benefits to the use of debt. Median values for kink are 2.0 for the aggressive group and 9.0 for the conservative group (recall that Graham (2000) assigns all firms a kink value of 9.0 if their estimated level of kink is 9.0 or above). This indicates that the median firm in the conservatively financed group could increase its interest expense by at least 900 percent before losing any expected tax benefits from additional debt financing. The median (mean) debt to assets ratio is 0.296 (0.324) for the aggressively financed firms, and 0.094 (0.120) for the conservatively financed firms. The median (mean) level of taxes paid (after adjusting for deferred taxes) per dollar of assets is 0.014

(0.019) for the aggressively financed group and 0.057 (0.062) for the conservatively financed group indicating that the median firm in the conservatively financed group has a tax bill (per dollar of assets) that is over four times that of the median aggressively financed firm.

Miller (1977) points out that personal taxes can provide a disincentive to the use of debt. Evidence provided by Buser and Hess (1983), measuring a positive effective personal tax rate on equity and Trzcinka and Kamma (1983) who find that the marginal bondholder's tax rate is significantly less than the corporate rate illustrate that Miller's argument that the personal tax cost of debt *eliminated* the corporate tax incentive for the use of debt at the margin is not likely to hold. Black (1976) refers to the fact that a majority of dividends are paid to individuals in high tax brackets as the dividend puzzle. This suggests that the taxation of equity and debt income may not actually be all that different. It is true however that personal taxes may diminish the incentive for corporations to use debt. The larger is the actual differential taxation for individuals on debt versus equity income, the smaller will be the incentive for firms to use debt.

To investigate whether the personal tax penalty on interest income is larger for conservatively financed firms we compute a proxy for the effective tax rate on equity income similar to the one used in Graham (2000). This measure of the personal tax rate on equity captures the proportions of the firm's returns to equity holders that are provided by dividends versus capital gains. In the extreme, if a firm has all its return in the form of dividends (and if dividend clientele effects are not significant), there is no difference for that firm's investors in the personal tax rate on debt or equity income. As seen in Table 1, firms in the conservatively financed group actually pay higher dividends relative to assets compared to firms in the aggressively financed group. Additionally, estimates of the effective personal tax rate on equity income in the conservative group are at least as large as

those in the aggressive group. These findings suggest that differences in the personal tax penalty associated with interest income are unlikely to explain the amount of debt used by the conservative firms.

Finally, Panels B and C of Table 1 illustrate that the capital structures chosen by the conservatively financed firms are quite persistent. Panel B indicates that more than 60% of the conservatively financed firms remain in the top quartile of kink five years after the ranking year. Panel C shows that 81% of firms that begin in the top quartile of kink in a given year have kink measures in the top half of all firms five years after the ranking year.

In sum, "high kink" firms appear to be very conservatively financed by a variety of measures and appear to forego significant tax benefits associated with debt financing. The large differences in the capital structure choices made by conservatively and aggressively financed firms suggest that it should also be relatively easy to identify differences in the potential costs associated with the use of debt financing by comparing these two groups of firms.

3. Capital Structure Theories and Empirical Tests

Capital structure theory is much to involved to fully review here and such a review would be well beyond the scope of this paper. We will instead attempt to provide a general discussion and summary of the empirical implications of the major theories as they relate to our empirical tests. Harris and Raviv (1991), Bradley, Jarrell, and Kim (1984) and others have provided excellent literature reviews and the reader is directed to those papers for a more complete presentation of the theoretical literature. We will organize our discussion by presenting first the tradeoff theory predictions, then turn to the pecking order theory, and finally discuss how conflicts of interest

between owners and managers are predicted to affect capital structure.

3.1 Tradeoff Theory

Following the work of Modigliani and Miller (1958, 1961) the idea that a firm's value maximizing capital structure would be established by equating the marginal benefits and marginal costs of the use of debt financing gained widespread acceptance. The evolution of this fundamental idea mirrors the development of arguments for different costs and benefits of debt financing. We will briefly discuss the major categories of costs below and list exogenous variables that have been identified (or hypothesized) as affecting the capital structure choice.

Direct and Indirect Costs of Distress

The most obvious cost of debt financing is embodied in a firm's expected bankruptcy costs. These costs are thought to increase as the probability of bankruptcy rises, as the assets of the firm are more intangible than tangible, as the product is more unique, as the bargaining environment becomes more difficult, and to fall (relative to firm value) as the firm becomes larger. Standard proxy variables for these characteristics are as follows. Altman's Z-score and the volatility of cash flows are often used to measure the probability of bankruptcy, which is expected to be negatively related to the level of debt. The proportion of total assets not made up of property, plant, and equipment and standardized levels of R&D expenditures are used to measure the intangibility of assets, and are expected to be negatively related to the amount of debt used. Titman and Wessels (1984) identify firms in industries with SIC codes between 340-400 as producing unique products. Firm size is measured as the natural log of the book value of total assets, which is predicted to be positively related to debt usage. Finally, the number of different debt issues (Gilson, John, and Lang (1990)) or the amount of trade credit have been used to measure the difficulty of bargaining in

distress or bankruptcy which are predicted to be negatively related to the use of debt.

The probability of bankruptcy and the complexity of the capital structure are controlled by the firm's management and some care must be taken in using these variables. The conservatively financed firms we focus on often have less debt than cash so attempting to relate the complexity of their capital structure to their debt levels is likely to be uninformative. Also, using Altman's Z-score would be misleading as firms that choose very little debt will wind up with relatively small probabilities of bankruptcy, contrary to the theory. We use a "what if" version of the Z-score to attempt to measure what the Z-score of the conservative firms would be if they used as much debt as the median firm in the more aggressively financed group[4] and the amount of trade credit to proxy for difficulties inherent in the bargaining environment.

More profitable firms, everything else equal, have greater tax related benefits to the use of debt financing and so are expected to use more debt. We use return on assets as a measure of profitability. One of the better known results concerning capital structure (Myers (1993)) is that this prediction of the tradeoff theory is not borne out in the data.

Agency Costs

Myers (1977) points out that firms with a large portion of firm value made up of growth options will refrain from using much debt to avoid under-investment problems. It has become common to use the market value of the firm divided by the book value of assets to proxy for Tobin's *q* which, in part, measures the value of growth opportunities. We also use the ratio of R&D expenses

[4]We compute the what if Z-score by increasing the debt to assets ratio and decreasing the ratio of retained earnings to assets to that of the median aggressive firm. Because the difference in profitability of firms in the two groups is not accounted for, this measure should be biased downward for the conservative group (biased in favor of supporting the tradeoff theory).

to total assets to attempt to capture this characteristic of the firm's investment opportunity set.

Jensen and Meckling (1976) show that for firms with few profitable investment opportunities, heavy use of debt may result in an over-investment or risk-shifting problem. These would tend to be firms in mature industries, with low market to book ratios, and those with relatively more intangible assets (those assets most subject to managerial discretion).

Asymmetric Information

Myers and Majluf (1984) identify asymmetric information as a cost of external capital. They also point out that the more informationally sensitive is the value of a given security, the more the market will discount the value of that security if it is offered for sale by a firm. The payout structures of debt versus equity imply that the value of a debt contract will be less sensitive to information concerning the financial health of the firm than is the value of an equity contract. Thinking of this as an additional cost of external financing leads to a prediction that firms with greater informational asymmetries will use relatively more debt financing, all else equal. We measure the extent of informational asymmetry using measures of firm size, dividends relative to book assets, stock return volatility, stock turnover, and the age of the firm measured as the number of years since the firm was first listed on CRSP.

Product Market Characteristics

Chevalier (1995) and Phillips (1995) suggest that industry concentration can affect the desired debt levels and provides evidence consistent with this prediction from the supermarket industry. We use the three-digit SIC sales-herfindahl index as a measure of concentration.

3.1.1 Testing the Tradeoff Theory

According to the tradeoff theory, those firms that, at their optimum, have the highest

marginal benefits to the use of debt will also have the highest marginal costs. These costs, under the null hypothesis that the tradeoff theory guides debt policy choices, will be largest (and therefore most identifiable) for the firms in our sample with the highest level of unused tax benefits (kink).[5] Comparing those firms with the highest levels of unused tax benefits to those with lower levels of forgone tax savings should help us identify the important costs of debt financing and provide us with a particularly powerful test of the tradeoff theory.

Table 2 presents the industry characteristics of the sample. Panel A shows that the distribution of firm-years across industries is relatively similar across the two groups, and that the conservatively financed firms are not concentrated in any particular industries. Panel B explicitly considers the 3-digit SIC codes that Titman and Wessels (1988) identify as having unique products (SICs 340-400), and so higher costs of financial distress. The conservatively financed firms are somewhat more concentrated in the unique products industries. This may identify a possible difference in costs of distress across the two groups. Panel C presents the median sales Herfindahl indices computed at the three-digit SIC level. There is no evidence that the conservatively financed firms are in more concentrated industries.

Table 3 compares the means and medians of proxy variables that are commonly used to capture costs of debt financing across the two groups of firms.[6] The results, for a majority of these costs of debt financing, are, however, contrary to the predictions of the tradeoff theory. With respect to the potential costs of financial distress, the firms leaving the most tax benefits of debt on the table are, according to most measures, those with lower costs of debt capital. The conservative firms tend

[5]This assumes there are not significant, distinct jumps in the expected costs of debt.

[6]Similar results are obtained when we instead measure our variables on an industry adjusted basis.

to be larger, more profitable, have greater levels of internal cash flow (net of capital expenditure and dividend payments), and maintain larger cash balances. They also have less volatile earnings, and have lower likelihoods of bankruptcy.

Similarly, measures for the levels of asymmetric information are also not consistent with the predictions of the tradeoff theory. Compared to the more aggressively financed firms, conservatively financed firms have significantly higher dividend payout ratios, lower stock return volatility, similar levels of stock turnover (as a measure of liquidity), and are of similar age.

The univariate tests point to three explanations for the differences in observed debt policy choices that are consistent with the tradeoff theory. The first is the difference, noted above, in the concentrations of conservative firms in the unique products industries. The second is related to the firms' investment opportunity sets. The conservatively financed firms have higher market-to-book ratios than do the aggressively financed firms. They also have higher capital expenditures and R&D expenses, and lower proportions of tangible assets. These findings suggest that the under-investment problem identified by Myers (1977) may be an important cost of debt financing and may play a role in establishing financing policies. Finally, the lower proportion of tangible assets may simply suggest that these firms have fewer collateralizable assets than the firms that use debt more aggressively.

To further examine whether differences in the costs of debt financing can explain the conservative capital structures of high kink firms, Tables 4 and 5 report the results of Fama-Macbeth (1973) type regressions that examine how well the cost of debt variables explain the levels of kink.[7]

[7]Unreported results of regressions using the debt to assets ratio as the dependent variable provide results that are qualitatively the same as those reported here.

Table 4 presents the results for such a regression on the full sample of firms. The results are consistent with the univariate results reported above. In the first regression, R&D (a coefficient of 4.986) and the firm's market-to-book ratio (a coefficient of 0.672) are positively related to the level of kink. The fraction of assets in property plant, and equipment (PPE) is negatively (a coefficient of -1.944) related to the level of kink. Additionally, firms in unique product industries have higher levels of kink (a coefficient of 0.225), and older firms have lower levels of kink (a coefficient of -0.011). These results provide some support for the view that differences in the investment opportunity set are important determinants of the use of debt financing and support the predictions of the tradeoff theory.

In contrast to the tradeoff theory's predictions, however, firm size, the indicator variable of whether the firm makes dividend payments (DDUM), and the return on assets (ROA) are positively related to the level of kink. The regression also includes an indicator variable for firms with Z-scores less than -2.0 to control for the effects of financial distress (see Graham, Lemmon, and Schallheim (1998)).[8] As expected this variable is negatively related to the level of kink. The second regression, which uses the negative owners' equity indicator to control for financial distress, yields nearly identical results.

Although the coefficients on the investment opportunity set variables are statistically significant, and provide some support for the tradeoff theory's predictions it is useful to gauge the economic significance of these variables. Using the regressions and data from the univariate analysis in Table 3, we compute the amount by which the level of kink would change if the value of the

[8]Essentially the indicator is used to attempt to identify firms that are, ex post, in financial distress. These firms are likely to end up with high leverage as a result of distress.

independent variable changed from the mean value for the low kink firms to the mean level for the high kink firms. For R&D, a move from the mean of the low kink group to the mean of the high kink group implies a change in kink of 0.055=4.986*(0.030-0.019). For market-to-book, the implied change in kink is 0.672*(2.136-1.324)=0.545, and for the fraction of assets in property, plant, and equipment the implied change is -1.944*(0.323-0.380)=0.118. Small changes in kink are also implied for moves from non-unique to unique product industries and for changes in firm age. Given the large differences in the levels of kink between the two groups (means of 2.4 and 8.4) we conclude there is little evidence that differences in standard proxies for the costs of debt financing can explain conservative capital structures chosen by the high kink firms.

One possible reconciliation of these findings with the tradeoff theory is that the conservatively financed firms are extremely sensitive to changes in the costs of debt financing. To provide some evidence on this issue, Table 5 presents regression results for the two groups separately. These regressions show that the levels of kink of the conservatively financed firms are much less sensitive to the measures of the costs of debt than are those of the more aggressively financed firms. R&D, for example, has a coefficient of 2.192 for low kink firms versus a coefficient of 1.029 in the regression for the subsample of high kink firms.[9] These regressions provide additional evidence that the conservative capital structures chosen by high kink firms cannot be accounted for by the fact that these firms face higher costs of debt financing as measured by standard proxy variables.

In summary, sorting firms according to the benefits to the use of debt financing that they

[9]Because the sensitivity of kink to the costs of debt are much lower for the conservative group, it could be argued that the levels of economic significance reported above are overstated.

ignore should provide an ideal setting in which to identify the most important costs to the use of debt financing predicted by the tradeoff theory. Our evidence, however, indicates that the tradeoff theory does not provide an accurate description of how the cross-section of firms in our sample choose their capital structures. The fact that such a seemingly fundamental idea fails to explain financing choices for a large number of the most profitable and largest firms in the U.S. is some what troubling.

3.2 The Pecking Order Theory

Myers (1984) proposes an alternative to the tradeoff theory of capital structure. His theory is based upon the idea that managers act in the interests of the existing shareholders. This objective leads to a cost of external capital derived from asymmetric information between the firm and the market. When these costs overwhelm other considerations for financing choices, a pecking order for different types of financing is derived. Firms will find internally generated cash flow and existing financial slack (cash and other marketable securities) to be the cheapest source of capital. When firms exhaust internal funds they will turn to the external markets. In seeking external finance, firms will first issue low risk debt securities; securities whose value is very insensitive to any informational disadvantage the market may have relative to the managers. Additional capital will be raised using risky debt and then as a last resort, new equity.

The pecking order theory generates a variety of empirical predictions. Shyam-Sunder and Myers (1999) and Fama and French (2000) for example examine whether issues of debt or equity are used to control variations in earnings and investment. We instead directly examine the determinants of the likelihood that a given firm seeks external financing and then, given that the firm issues securities, what determines the choice between debt and equity securities.

Our evidence in the previous section indicates that the firms with the most conservative

capital structures also tend to be the most profitable and hold the largest amounts of financial slack as measured by their reservoirs of cash and liquid assets. While this would seem to provide some superficial evidence consistent with financing decisions being based on the pecking order hypothesis, it also illustrates that if the pecking order theory is a valid description of how firms' capital structures evolve, then the conservatively financed firms should exhibit pecking order behavior most clearly. Specifically, compared to more aggressively financed firms, the conservatively financed firms should more completely deplete their reservoirs of cash and internal funds before raising capital in the external markets, and should overwhelmingly favor debt financing when they do seek outside financing.[10]

3.2.1 Testing the Pecking Order Theory

We consider the determinants of the likelihood that firms go to the external markets and the conditional likelihood that they choose debt rather than equity when they do raise outside financing. Similar to Hovakimian, Opler, and Titman (2000) we use firm size, the market to book ratio, change in cash and marketable securities and the level of current cash flow (net of capital expenditures) to explain the likelihood that firms go to the external capital markets. Table 6 contains the results of three Logistic regressions where the dependent variable is an indicator variable set to one if a firm seeks external financing in a given year and zero otherwise. The reported p-values in the regressions are adjusted for heteroscedasticity and for clustering (non-independence of observations) within firms. We identify years in which firms seek external financing using data on securities issuances

[10]Shyam-Sunder and Myers, however, argue that they would expect firms with "painfully high" debt ratios to add equity while those whose debt ratios are near zero would find ways to increase the relative amount of debt. In other words, firms with extreme capital structures would be expected to find tradeoff theory forces relatively large. As we read their comment, firms with a very high kink rather than simply those with low debt to assets ratios would be the firms that would be expected to add debt.

(both debt and equity) from Securities Data Corporation (SDC) new issues database. Similar results are obtained if we instead identify external financing from the flow of funds data in Compustat. The first regression estimates the coefficients using the entire sample. The next two regressions are estimated separately on the subsamples of conservatively and aggressively financed firms so that we can examine the differences in sensitivities of the different independent variables across the two groups.

Confirming the results from previous studies, large firms are more likely to approach the external markets. A one standard deviation increase in size, holding other variables constant, increases the probability of going to the external markets by 5.1%. Size is often interpreted as being inversely related to informational asymmetries and therefore large firms would find external funding less costly than would their smaller counter-parts. Alternatively, if there are fixed costs to external financing and larger firms do larger issues, firm size may proxy for economies of scale in the market for external funds. The higher is the market to book ratio, the more likely (associated probability change of 3.2%) are firms to seek external financing. To the extent that the market to book ratio is a good proxy for firms' investment opportunities, the result is consistent with the intuition that firms with more profitable growth options tend to seek external financing more often than firms that have fewer opportunities for growth.

The regressions also show that firms with higher prior year levels of internal cash flow net of capital expenditures (associated probability change of 1.1%) and higher cash balances (associated probability change of 2.5%) are less likely to approach the external capital markets. These findings are consistent with the notion that firms with more financial slack are less likely to demand external financing and provides some initial evidence consistent with the pecking order predictions; however

the associated probability changes seem small.

In the full sample regression, we include a dummy variable set equal to one if the firm is in the conservatively financed group for the given year. The negative coefficient on the high kink dummy variable indicates that conservatively financed firms are somewhat less likely to seek external funding (associated probability change of 4.8%), even after controlling for other factors that should affect the demand for external financing.

The results for the subsample regressions are consistent with those in the full sample and indicate that similar factors are related to the demand for external financing across the two groups of firms with one exception. For the conservatively financed firms, the regression indicates that an increase in cash balances in the prior year makes it more likely that the firm will seek external financing. This finding does not seem to be consistent with the pecking order hypothesis.

Some additional light can be shed on the decision to seek external financing as compared to the pecking order theory's predictions by comparing the conservatively financed firms that seek external financing with the more aggressively financed firms that do as well. Consider Tables 7 and 8 and Figures 1 through 6 that compare issuers of debt and issuers of equity across the two groups of firms. Contrary to what the pecking order would predict, the conservatively financed firms on average seek external financing at times when they have cash balances, annual cash flows, and levels of working capital that are much higher than those of the aggressively financed firms. Although the conservatively firms (as compared to the more aggressively financed firms) apparently have the ability to depend upon internally generated funds and financial slack they seek external financing. For example, firms with conservative capital structures that issue debt maintain cash balances greater than 5% of assets for the five years surrounding the issue year and those that issue equity maintain

cash balances greater than 10% of assets. In fact, conservatively financed issuers of equity appear to seek outside equity financing after cash balances have increased. Finally, there is no evidence that conservatively financed issuers use these funds to increase future capital expenditures. The levels of capital expenditures relative to assets are nearly identical across the two groups of firms in the two years following the issue. There is no difference if we also include spending on acquisitions (results not reported in a table).

Table 9 presents the results of Logistic regressions, again estimated for the full sample as well as for the conservatively financed and aggressively financed subsamples, estimating the determinants of the likelihood that firms seeking external financing issue equity rather than debt. The dependent variable is an indicator set to one if the firm issues equity and zero if the firm issues debt in a given year. Firm size, profitability, current and past year's stock return, lagged market to book ratio, and the lagged debt to assets ratio are used as explanatory variables. We find larger firms are less likely to issue equity, while more profitable firms, firms with more growth options, firms with higher debt to asset ratios, and firms that have experienced a stock price "run up" are more likely to issue equity. Most importantly, we find no evidence that conservatively financed firms are less likely to issue equity than are the more aggressively financed firms. In the full sample regression, the coefficient on the dummy variable for firms in the high kink group is actually positive though statistically insignificant. Recall that the high kink firms are those with the largest unused tax benefits of debt financing, the largest cash balances, the most stable cash flows, the lowest probability of financial distress, and the lowest debt ratios. That these firms are not overwhelmingly likely to seek external funds in the form of debt rather than equity is contradictory to the pecking order for external securities.

The regressions estimated separately for the conservatively and aggressively financed subsamples confirm the results for the full sample except that, contrary to the conjecture by Shyam-Sunder and Myers (1999), for the conservatively financed firms, the existing debt to assets ratio has no effect on the choice of security issued. It is interesting to note that in each of the regressions that firm size is negatively related and the lagged market to book ratio is positively related to the likelihood of issuing equity.[11]

A possible reconciliation of our findings and the pecking order hypothesis could be found if the conservatively financed firms, perhaps due to the stability of their cash flows or larger size, do not suffer costs of adverse selection when issuing equity to the same extent as the more aggressively financed firms. Recall, however, that the comparisons in Table 3 suggest that this is not the case. To further test this possibility we examine the announcement period returns for the conservatively and aggressively financed firms that announce new equity financing. The results of the event study, using a three-day {-1, +1} announcement period window, are reported in Table 10. Abnormal returns are computed based on a market model estimated over the 150 day period beginning 200 days and ending 50 days prior to the announcement. The announcement dates are those reported by SDC. If an announcement date is not reported we use the filing date as reported by SDC. Panel A compares the average cumulative abnormal returns for the two groups. While the average CAR for the conservatively financed group is more negative, the difference is not statistically significant.

Panel B presents results of a regression analysis using the CARs as the dependent variable. Consistent with the reactions being caused by an adverse selection problem, larger issues are

[11]Interpreting size and the market to book ratio as indicators of asymmetric information, the signs of the coefficients on these variables are inconsistent with the basic argument that it is costs of asymmetric information that guide the choice of which security to issue.

associated with more negative (though not significant) market reactions, as are the price responses to issues by firms with higher cash balances at the time of announcement. Firms with more valuable investment opportunities, as measured by the market to book ratio, have less negative reactions. Interestingly, for this sample, if the issue includes secondary shares the reaction is less negative. The coefficient on a dummy variable for firms in the high kink group is negative but insignificant, indicating that the investors react similarly to equity issues by the two types of issuers.

In summary, consistent with the predictions of the pecking order hypothesis, we do find some evidence that firms with more internal cash flow and higher levels of financial slack are less likely to seek external financing. However, when they do raise outside financing, the financially conservative firms maintain large cash balances and appear to have ample internal funds available for investment. Moreover, financially conservative firms are just as likely as other firms to issue equity when they seek outside financing. These findings are inconsistent with the predictions of the pecking order hypothesis. Overall, the pecking order hypothesis does not provide a good description of how these financially conservative firms make choices about sources of external financing.

3.3 Financial Flexibility

Graham and Harvey's (1999) survey tells us that a frequently reported reason for conservative capital structure choices is financial flexibility. Managers claim that they maintain low debt ratios and high cash balances to ensure that they may take advantage of investment opportunities as they come along. Maintaining a low debt ratio ensures that they will have ready access to the capital markets should the firm's financing needs exceed the firm's internal resources. This explanation is consistent with both the tradeoff theory (considering dynamic aspects of the capital structure problem and the destruction of growth options as a cost of current debt) and with the pecking order theory

(maintaining access to the lowest cost financing) and may explain why, for the conservative firms, the dominant theories do not seem to explain the financing choices made.

3.3.1 Testing the Financial Flexibility Theory

We examine the financial flexibility explanation by comparing the sensitivity of investment to annual cash flow across the high and low kink groups. If there are differential benefits to flexibility it should be due to the fact that some firms have investment opportunity sets with valuable growth opportunities that place a very high value on immediacy. For these types of firms, all else equal, we would expect that current investment would be very insensitive to annual cash flow. For firms with a high value to immediacy and so a high demand for flexibility we would also expect that current investment would be more responsive to the availability of growth opportunities since these firms would have higher costs to delay. When firms with a high demand for immediacy face more investment opportunities, a higher level of liquid assets, all else equal, should imply relatively more current investment than it would for other firms. This is because those firms that demand and maintain flexibility (at some cost) would be more likely to use it to immediately pursue the valuable investments. Thus, if the high kink firms maintain conservative capital structures and large cash balances because they value financial flexibility, then, compared to the more aggressively financed group, we expect that the capital expenditures of these firms will be less sensitive to changes in the levels of internal cash flows and more sensitive to the availability of attractive investment opportunities.

Table 11 presents the results of regressions that use the levels of current cash flow, the market to book ratio, sales growth, and cash balances to explain the current level of capital expenditures. The regression coefficients indicate that current capital expenditures are positively

related to the levels of current cash flow, measures of investment opportunities (the firm's market to book ratio and sales growth), and the firm's cash balance. The interaction term between the cash flow to assets variable and the high kink dummy, however, shows that the conservatively financed firms' current capital expenditures are actually more sensitive to current cash flow than are the capital expenditures of the more aggressively financed firms. The conservatively financed firms are those firms that should be the least financially constrained of any in the market and so, consistent with the findings of Kaplan and Zingales (1997) and Cleary (1999), we find that the least constrained firms have investment that is the most sensitive to current cash flow. This is inconsistent with the idea that these firms maintain a high level of financial slack so that investment will not be sacrificed in years with poor cash flow.

Finally, consider the two proxies for the availability of valuable investment projects; the current market to book ratio and the past growth in sales. Considering the market to book ratio, we find that conservatively financed firms actually invest less in response to an increase in growth opportunities than do the aggressive firms. If an increase in a firm's market to book ratio indicates an increase in the value of its growth options, then this finding also contradicts the notion that the conservatively financed firms demand financial flexibility. The conservatively financed firms' capital expenditures, however, do respond more strongly to an increase in the growth of sales. To the extent that past sales growth proxies for the value of current investment opportunities this is contrary to the result for the market to book ratio and is consistent with the idea that conservatively financed firms respond more strongly to valuable investment opportunities than do aggressive firms. This finding may alternatively be an indication that conservative firms are investing to increase sales rather than value.

3.4 Stockholder - Manager Conflicts of Interest

Jensen (1986) argues that one of the most important conflicts of interest between owners and managers concerns the decision to payout free cash flow. If managers do not own significant amounts of stock in their firms, they can use the free cash flow for their own purposes, reaping most of the benefits yet paying only a small portion of the costs of their behavior (Jensen and Meckling (1976)). Jensen also notes that debt financing can be used to control this conflict of interest. If managers of firms that generate lots of free cash flow (after allowing for investments in positive net present value projects) can be motivated to substitute debt for equity financing they would be required to payout the free cash flow to the contributors of capital, reducing the conflict of interest.

Jensen's arguments suggest two necessary conditions for using stockholder – manager conflicts of interest to explain overly conservative capital structure choices. First, managers must be relatively "poorly" compensated. In other words, managers must value their private benefits more than they value the increase in stock based compensation that would accrue to the use of less conservative debt policies. Secondly, the managers must be entrenched enough so that neither stockholders (perhaps via the board of directors) nor pressure from the market for corporate control can induce them to alter their debt policies.

These arguments imply that levels of managerial stock or option ownership should be positively related to leverage. In addition, the likelihood of a takeover and the likelihood of forced CEO turnover should also be positively related to leverage. Finally, if conflicts of interest are responsible for the conservative capital structures we observe then leverage should increase substantially following management turnover and takeover attempts (e.g., Berger, Ofek, and Yermack (1997)).

3.4.1 Testing the Manager - Stockholder Conflict Hypothesis

If the conservative capital structures of high kink firms arise because managers in these firms are more entrenched than their counterparts in low kink then we expect that, all else equal, high kink firms will be less likely to become acquisition targets. Table 12 presents results on the frequency of acquisition bids in the two groups. Panel A reports the unconditional frequency of merger/acquisition bids, successful acquisitions, and hostile bids for the two groups. As seen in the table, acquisitions attempts and successful acquisitions are about twice as likely among firms with more aggressive capital structures compared to those with more conservative capital structures. The differences are significant at better than the 0.01 level. Additionally, the frequency of hostile bids is also lower (p=0.021) for the conservative firms. Panel B presents Logistic regressions of the likelihood of the firm receiving a takeover bid. The reported p-values in the regressions are adjusted for heteroscedasticity and for clustering (non-independence of observations) within firms.

The regression specifications are similar to those in Harford (1999). The first regression in the table indicates that takeover bids are less likely in firms with high market-to-book ratios and when the firm has excess cash relative to the industry median. These findings are similar to those reported in Harford, who finds that cash rich firms are less likely to become acquisition targets. Our results, however, indicate that our measure of financial conservatism adds additional explanatory power beyond the firm's excess cash holdings. The second regression adds the high kink dummy variable to the specification. As seen in the table, even after controlling for other factors, conservative firms are significantly less likely to receive takeover bids compared to aggressive firms (p=0.00). Moreover, the predictive ability of market-to-book and ROA become weaker after adding the high kink dummy. Overall, these results provide some evidence that managers in conservatively

financed firms are more entrenched and that financial conservatism allows managers to avoid pressure from the market for corporate control.

To further explore the entrenchment hypothesis, Table 13 reports statistics on the the level of ownership by officers and directors and rates of CEO turnover and CEO age for the two groups of firms. The ownership data is only available for the subsample of firms that are also covered by Compact Disclosure over the period 1989-1995. The data on CEO turnover is only available for a subsample of our firms that overlap with the sample in Huson, Parrino, and Starks (2000). Panel A of the table indicates that the mean (median) level of fractional inside ownership is 0.179 (0.099) in low kink firms and 0.158 (0.088) in high kink firms. Neither the difference in means or medians is statistically significant. Panel B of the table shows that overall rates of CEO turnover are also not significantly different across conservative and aggressive firms. Moreover, the fraction of CEO turnovers that are forced is also similar (0.148 for aggressively financed and 0.138 for conservative financed firms) across the two groups. In addition, the median CEO age is 57 years for both groups. On balance, these findings provide some, but not strong, evidence that managers of financially conservative firms avoid debt because they are more entrenched.

Some final evidence on managerial entrenchment is presented in Figure 7. The figure plots the debt ratios in the years surrounding unsuccessful takeovers and forced CEO departures for firms in the high and low kink groups. If managers in financially conservative firms are able to avoid debt because they are more entrenched then we expect debt ratios to increase more in financially conservative firms than in other firms following corporate control threats and managerial turnover. The figure provides evidence that is consistent with this view. In the second year following an unsuccessful acquisition attempt the mean debt ratio of high kink firms rises to 26% from 13% in

the year prior to the acquisition attempt. For low kink firms, the mean debt ratio increases to 38% from 32% in the year prior to the acquisition attempt. By the second year after a forced CEO departure, high kink firms see their debt ratios rise to 14% from about 8% in the year prior to turnover, while the leverage ratios of low kink firms decrease to 28% from 32% in the year prior to turnover. These findings provide some evidence that financially conservative firms are underlevered and that these firms increase their leverage only when managerial security is threatened.

4. Conclusion

We examine the capital structure choices made by firms using a new measure of the foregone tax benefits associated with debt financing to sort firms into two groups: firms that use debt conservatively and firms that use debt more aggressively. We document that a large fraction of firms appear to be very conservatively financed and forego significant tax benefits associated with debt financing. The predominant theories of capital structure financial economists have offered to explain capital structure choices do not appear to explain the capital structure choices of these firms.

In terms of the tradeoff theory of capital structure we find little evidence that the foregone tax benefits of debt are offset by high costs of debt financing for firms with conservative capital structures. Conservatively financed firms are actually larger, more profitable, and have more stable cash flows compared to firms with more aggressive capital structures. We also do not find evidence that pecking order considerations explain the capital structure choices of conservatively financed firms. Firms with the most conservative capital structures maintain large reservoirs of financial slack even when they seek external financing, and do not appear to favor debt financing when they raise external capital. In addition, the negative market reaction to equity issue announcements is similar

for both conservatively financed and aggressively financed firms. We find mixed evidence regarding theories of managerial entrenchment. The most conservatively financed firms are less likely to become acquisition targets, but levels of inside ownership and rates of CEO turnover are similar to those in more aggressively financed firms. In addition, leverage increases following unsuccessful takeover attempts and forced CEO departures are larger in firms with the most conservative capital structures suggesting that these firms have excess debt capacity.

In our view, none of the predominant capital structure theories are able to adequately describe the financing decisions of the broad cross-section of firms in our sample. To the extent that debt financing is tax favored it seems that conservatively financed firms could easily accommodate more debt financing and increase shareholder value. Our analysis shows that the firms with the most conservative financial policies also tend to share two other characteristics examined in the literature. They tend to be cash rich (see for example, Opler, Pinkowitz, Stulz, and Williamson (1999) and Harford (1999)) and to have investment levels that are more sensitive to current cash flow (e.g. Fazarri, Hubbard, and Peterson (1988), Kaplan and Zingales (1997), and Cleary (1999)) than the investment of firms with more aggressive debt policies. Rather than treat these characteristics separately, our results suggest that recognition of their endogenous nature is more appropriate. Jensen's (1986) free cash flow hypothesis offers one possible approach. Perhaps managers of very profitable firms, entrenched by their performance (relative to other firms in the industry or market), are able to pursue wasteful financial and investment policies. The use of debt would require that they payout the free cash flow that allows the consumption of excess perquisites and so it is minimized. If some of their "on the job consumption" comes in the form of wasteful investment projects, this "discretionary" investment may be sacrificed when incoming cash flow drops, causing

total investment to vary strongly with current cash flow while "valuable" investment is independent of incoming cash. Obtaining a better understanding of the interactions between financial conservativism, firms' cash holdings, and investment decisions represents an interesting area for future research.

Appendix A: Data Definitions

This appendix defines the financial measures used in this study. Compustat data items are identified as data#. Stock return data comes from Center for Research in Securities Prices (CRSP).

Variable Name	Source	Description
Total Book Assets	Compustat	data 6
Debt-to-total assets	Compustat	(data 9 + data34)/data 6
Interest coverage	Compustat	data 13/data 15
Taxes paid-to-total assets	Compustat	(data16-data50)/(data6)
Return on Assets (ROA)	Compustat	data13/data6
Property plant and equipment-to-total assets	Compustat	data8/data6
Market-to-book	Compustat	(data6-data60+data24*data25)/data6
Dividends-to-total assets	Compustat	data21/data6
Ddum	Compustat	indicator equal to one if data21>0
R&D-to-total assets	Compustat	Max(0,data46)/data6; Missing values of R&D are coded as zero
Cash-to-total assets	Compustat	data1/data6
Capital expenditures-to-total assets	Compustat	data128/data6
Net cash flow-to-total assets	Compustat	(data13-data21-data128)/data6
Z-score	Compustat	3.3*data178/data6+1.2*(data4-data5)/data6+data12/data6+ 0.6*(data24*data25)/(data9+data34)+1.4*data36/data6

Appendix A: Data Definitions (continued)		
Variable	Source	Description
Zdum	Compustat	Indicator equal to one if Z-score<-2
OENEG	Compustat	Indicator equal to one if owners' equity (data 60)<0
Accounts payable-to-total assets	Compustat	data70/data6
Earnings volatility	Compustat	standard deviation of changes in operating income after depreciation (data178) divided by total assets (data6)
Stock turnover	CRSP	Monthly share volume/shares outstanding
Stock return volatility	CRSP	Monthly share volume/shares outstanding
Firm Age	CRSP	Years since initial CRSP listing date

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Table 1. Summary statistics of kink and other leverage measures for high and low kink firms. A firm is classified in the high kink group if its kink measure as defined in Graham (2000) is in the top quartile of firms in that year. Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline. Kink takes on values between zero and nine. The sample consists of 31,975 firm years from 1980-1995. Firms in the high kink group are conservatively financed with respect to debt. Panel B reports the percentage of firms remaining in the high kink group over the five years following the ranking year.

Variable	Median		Mean		Anova p-value (% sig. at 0.10)	Wilcoxon p-value (% sig. at 0.10)
	Low Kink (N=24072)	High Kink (N=7903)	Low Kink (N=24072)	High Kink (N=7903)		
Kink	2	9	2.428	8.421	0.000 (100.0)	0.000 (100.0)
Debt/Assets	0.296	0.094	0.324	0.120	0.008 (93.8)	0.000 (100.0)
Interest Coverage	4.103	20.129	12.621	119.304	0.018 (93.8)	0.000 (100.0)
Taxes Paid/ Assets	0.014	0.057	0.019	0.062	0.000 (100.0)	0.000 (100.0)
Marginal tax rate	0.340	0.350	0.242	0.361	0.000 (100.0)	0.000 (100.0)
Dividends/ Assets	0.004	0.021	0.011	0.027	0.000 (100.0)	0.000 (100.0)
Effective tax rate on equity income	0.118	0.148	0.156	0.158	0.293 (43.8.)	0.064 (81.2)

Panel B. Percentage of high kink firms remaining in the top quartile of kink in the five years following ranking.

Year 0	Year +1	Year +2	Year +3	Year +4	Year +5
100%	80%	74%	69%	65%	62%

Panel C. Percentage of high kink firms remaining in the top half of kink in the five years following ranking.

100%	91%	88%	86%	83%	81%

Table 2. Industry distribution sample firms. A firm is classified in the high kink group if its kink measure as defined in Graham (2000) is in the top quartile of firms in that year. Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline. Kink takes on values between zero and nine. The sample consists of 31,975 firm years from 1980-1995. Firms in the high kink group are conservatively financed with respect to debt. Panel A reports the one-digit SIC code distribution of the sample. Panel B reports the distribution of sample firms in unique and non-unique product industries, where SIC codes 340-400 are used to define unique product industries. Panel C reports the median three-digit SIC sales herfindahl index.

Panel A.	Percentage of firms in each industry		
One digit SIC	Low Kink	High Kink	Missing Kink
0	0.5	0.6	0.4
1	9.2	4.3	10.7
2	19.8	29.1	17.3
3	33.5	40.3	27.8
4	8.0	3.4	12.3
5	16.9	10.8	13.9
7	8.4	8.3	11.5
8	3.5	3.1	6
9	0.2	-----	0.1
Panel B.	Percentage of firms in unique product industries (SICs 340-400)		
Non Unique Products	73.4	65.2	77.8
Unique Products	26.6	34.8	22.2
Panel C.	Median three-digit SIC code sales Herfindahl indices		
Herfindahl Index	0.107	0.095	0.103

Table 3. Summary statistics of proxies for the costs associated with debt financing for high and low kink firms. The table reports means and medians of various proxies for the costs associated with debt financing for high and low kink firms. The variables are defined more fully in the appendix. The table also reports the average p-values and the percentage of years with significant test statistics at the 0.1 level for tests of differences in the variables across high and low kink firms.

Variable	Median		Mean		Anova p-value (% sig. at 0.10)	Wilcoxon p-value (% sig. at 0.10)
	Low Kink (N=24072)	High Kink (N=7903)	Low Kink (N=24072)	High Kink (N=7903)		
Total Assets	245.500	249.064	1780.420	1857.300	0.553 (0.0)	0.120 (62.5)
ROA	0.122	0.200	0.116	0.206	0.000 (100.0)	0.000 (100.0)
PPE/Assets	0.338	0.288	0.380	0.323	0.000 (100.0)	0.000 (100.0)
Market-to-Book	1.160	1.756	1.324	2.136	0.004 (100.0)	0.000 (100.0)
R&D/Assets	0.000	0.007	0.019	0.030	0.000 (100.0)	0.000 (100.0)
Firm Age (Years Since CRSP Listing)	13.0	12.0	16.7	15.3	0.289 (50.0)	0.194 (56.2)
Cash/Assets	0.042	0.118	0.084	0.162	0.000 (100.0)	0.000 (100.0)
Cash/Assets relative to 3-digit SIC median	-0.002	0.029	0.015	0.071	0.000 (100.0)	0.000 (100.0)
Cap. Ex./Assets	0.059	0.068	0.079	0.084	0.237 (43.8)	0.024 (93.8)
Net Cash Flow/Assets	0.042	0.095	0.026	0.096	0.000 (100.0)	0.000 (100.0)

Table 3 (continued). Summary statistics of proxies for the costs associated with debt financing for high and low kink firms. The table reports means and medians of various proxies for the costs associated with debt financing for high and low kink firms. The variables are defined more fully in the appendix. The table also reports the average p-values and the percentage of years with significant test statistics at the 0.1 level for tests of differences in the variables across high and low kink firms.

Variable	Median		Mean		Anova p-value (% sig. at 0.10)	Wilcoxon p-value (% sig. at 0.10)
	Low Kink (N=24072)	High Kink (N=7903)	Low Kink (N=24072)	High Kink (N=7903)		
Z-Score	3.457	10.440	27.637	179.992	0.0497 (93.8)	0.000 (100.0)
What if Zscore	3.327	4.999	3.592	5.728	0.000 (100.0)	0.000 (100.0)
Stock Turnover	0.0490	0.0463	0.0717	0.0835	0.212 (62.5)	0.041 (81.25)
Stock-return volatility	0.104	0.089	0.1159	0.0981	0.000 (100.0)	0.000 (100.0)
Earnings volatility	0.042	0.039	0.062	0.061	0.445 (31.3)	0.198 (75.0)
Accts. Payable/Assets	0.081	0.068	0.101	0.085	0.031 (93.8)	0.006 (100.0)

Table 4. Full sample regressions of Kink on various control variables. The dependent variable is kink as calculated by Graham (2000). Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline. The independent variables include the log of total assets, the market-to-book ratio, the ratio of R&D expenditures to total assets, is an indicator equal to one if firm pays dividends (DDUM), an indicator variable equal to one when the value of Z-score is less than -1 (ZDUM), and an an indicator equal to one if the book value of owners' equity is negative (OENEG). Zdum is an indicator variable equal to one when the value of Z-score is less than -1. DDUM is an indicator equal to one if firm pays dividends. OENEG is an indicator equal to one if the book value of owners' equity is negative. The coefficients and t-statistics are based on Fama Macbeth (1973) regressions.

Variable	Kink	
Intercept	0.330	0.725
	(1.547)	(3.176)
log of total assets	0.104	0.081
	(4.733)	(3.463)
Market-to-book	0.672	0.660
	(12.931)	(10.922)
R&D-to-assets	4.986	4.648
	(6.489)	(6.448)
DDUM	1.416	1.358
	(29.315)	(24.037)
PPE/Assets	-1.944	-2.037
	(-18.872)	(-25.510)
ROA	13.292	12.413
	(21.075)	(18.559)
Unique Product	0.225	0.241
	(5.517)	(4.972)
Firm Age	-0.011	-0.009
	(-5.292)	(-5.143)
ZDUM	-0.330	_____
	(-0.648)	
OENEG	_____	-1.437
		(-15.075)

Table 5. Regressions of Kink on various control variables. The dependent variable is kink as calculated by Graham (2000). Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline. , which measures the degree to which the firm could increase its interest expense without losing any tax benefits associated with debt financing. The independent variables include the log of total assets, the market-to-book ratio, the ratio of R&D expenditures to total assets, is an indicator equal to one if firm pays dividends (DDUM), an indicator variable equal to one when the value of Z-score is less than -1 (ZDUM), and an an indicator equal to one if the book value of owners' equity is negative (OENEG). The coefficients and t-statistics are based on Fama Macbeth (1973) regressions.

Variable	Kink		Kink	
	Low Kink	High Kink	Low Kink	High Kink
Intercept	0.098	8.258	0.204	8.492
	(0.957)	(36.440)	(1.829)	(53.836)
Log of total assets	0.171	-0.048	0.170	-0.060
	(12.580)	(-4.281)	(12.654)	(-4.323)
Market-to-book	0.295	0.086	0.312	0.078
	(7.109)	(4.283)	(8.385)	(3.849)
R&D-to-assets	2.192	1.029	1.828	0.795
	(3.523)	(2.487)	(3.050)	(2.375)
DDUM	0.996	0.101	0.922	0.066
	(18.414)	(2.114)	(14.190)	(2.103)
PPE/Assets	-1.149	-0.241	-1.110	-0.282
	(-14.154)	(-5.210)	(-16.653)	(-4.730)
ROA	8.408	1.321	7.500	1.012
	(11.751)	(3.171)	(10.573)	(3.223)
Unique Product	-0.026	0.086	-0.021	0.061
	(-0.651)	(2.761)	(-0.465)	(2.647)
Firm Age	-0.005	-0.003	-0.004	-0.002
	(-4.850)	(-3.008)	(-4.320)	(-2.785)
ZDUM	-0.119	-0.031	_____	_____
	(-0.367)	(-1.050)		
OENEG	_____	_____	-0.912	-0.471
			(-33.363)	(-2.630)

Table 6. Logistic regressions predicting whether a firm raises funds from the capital market in a given year. The dependent variable is equal to one if the firm issues either debt or equity in year t and is equal to zero if the firm does not issue securities in year t. High kink is an indicator equal to one if the firm is in the top quartile of kink in that year. Other independent variables include the log of total assets, the market-to-book-ratio, the ratio of cash to total assets, the change in the cash balance, and the firm's internal cash flow net of capital expenditures. All of the independent variables are measured at year t-1. Indicator variables for the years 1981-1995 are included. The coefficient estimates from the Logistic regression are reported along with their associated p-values in parentheses. The reported p-values are adjusted for heteroscedasticity and for clustering within firms. Reported in brackets are the estimated changes in the probability of issuing securities corresponding to a one standard deviation change in the independent variable. When the independent variable is an indicator we report the change in the probability of issuing securities corresponding to a change in the value of the indicator variable from zero to one.

	All Firms	Low Kink Firms	High Kink Firms
Variable	Issue=1/No Issue=0	Issue=1/No Issue=0	Issue=1/No Issue=0
Intercept	-3.650	-3.972	-3.027
	(0.000)	(0.000)	(0.000)
High Kink	-0.426 [-0.048]	_____	_____
	(0.000)		
Log of Total Assets (t-1)	0.264 [0.051]	0.297 [0.061]	0.140 [0.022]
	(0.000)	(0.000)	(0.000)
Market-to-Book (t-1)	0.247 [0.032]	0.326 [0.034]	0.167 [0.023]
	(0.000)	(0.000)	(0.000)
Cash-to-total assets (t-1)	-1.574 [-0.025]	-1.483 [-0.022]	-2.592 [-0.039]
	(0.000)	(0.000)	(0.000)
Change in cash from t-2 to t-1 to	0.078 [0.006]	0.016 [0.002]	0.624 [0.027]
total assets	(0.793)	(0.368)	(0.003)
Internal cash flow net of capital	-0.904 [-0.011]	-0.810 [-0.011]	-1.108 [-0.010]
expenditures (t-1)	(0.000)	(0.000)	(0.060)
Year Dummies	Yes	Yes	Yes
N	27,892	21,041	6,851

Table 7. Median accounting ratios of debt issuers in the years surrounding the security issue. The table reports the median accounting ratios of firms issuing debt over the years surrounding the debt issue. Debt issues are defined using Securities Data Corporation's New Issues Database. Panel A reports ratios for firms that are in the low kink group in the year of issuance (year 0), and Panel B reports ratios for firms that are in the high kink group in the year of issue. A firm is classified in the high kink group if its kink measure as defined in Graham (2000) is in the top quartile of firms in that year. Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline.

Variable	Year Relative to Security Issue				
	-2	-1	0	1	2
Panel A.	Low Kink Debt Issuers				
Debt to Assets	0.302	0.306	0.341	0.339	0.327
ROA	0.145	0.142	0.135	0.134	0.135
Cash to Assets	0.035	0.031	0.033	0.034	0.032
Capital Expenditures to Assets	0.075	0.077	0.072	0.068	0.064
Working Capital to Assets	0.087	0.084	0.079	0.073	0.069
Panel B.	High Kink Debt Issuers				
Debt to Assets	0.150	0.159	0.217	0.227	0.229
ROA	0.208	0.204	0.190	0.179	0.174
Cash to Assets	0.063	0.055	0.055	0.054	0.053
Capital Expenditures to Assets	0.079	0.077	0.076	0.072	0.066
Working Capital to Assets	0.117	0.113	0.114	0.109	0.110

Table 8. Median accounting ratios of equity issuers in the years surrounding the security issue. The table reports the median accounting ratios of firms issuing equity over the years surrounding the equity issue. Equity issues are defined using Securities Data Corporation's New Issues Database. Panel A reports ratios for firms that are in the low kink group in the year of issuance (year 0), and Panel B reports ratios for firms that are in the high kink group in the year of issue. A firm is classified in the high kink group if its kink measure as defined in Graham (2000) is in the top quartile of firms in that year. Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline.

Variable	Year Relative to Security Issue				
	-2	-1	0	1	2
Panel A.	Low Kink Equity Issuers				
Debt to Assets	0.309	0.312	0.272	0.265	0.269
ROA	0.133	0.132	0.134	0.134	0.128
Cash to Assets	0.043	0.043	0.053	0.048	0.046
Capital Expenditures to Assets	0.073	0.069	0.072	0.076	0.074
Working Capital to Assets	0.105	0.102	0.105	0.107	0.109
Panel B.	High Kink Equity Issuers				
Debt to Assets	0.125	0.098	0.078	0.098	0.117
ROA	0.213	0.208	0.207	0.190	0.176
Cash to Assets	0.102	0.132	0.165	0.137	0.103
Capital Expenditures to Assets	0.077	0.074	0.076	0.078	0.074
Working Capital to Assets	0.164	0.175	0.167	0.175	0.184

Table 9. Logistic regressions predicting whether the firm issues debt or equity conditional on issuing securities in a given year. The dependent variable is equal to one if the firm issues equity in year t and equal to zero if the firm issues debt in year t. High kink is an indicator equal to one if the firm is in the top quartile of kink in that year. Other independent variables include the log of total assets, the average return on assets, the buy-and-hold stock return, the market-to-book-ratio, and the ratio of debt-to-total assets. All of the independent variables are measured at year t-1. Indicator variables for the years 1981-1995 are included. The coefficient estimates from the Logistic regression are reported along with their associated p-values in parentheses. The reported p-values are adjusted for heteroscedasticity and for clustering within firms. Reported in brackets are the estimated changes in the probability of issuing securities corresponding to a one standard deviation change in the independent variable. When the independent variable is an indicator we report the change in the probability of issuing securities corresponding to a change in the value of the indicator variable from zero to one.

	All Firms	Low Kink Firms	High Kink Firms
Variable	1=Equity Issue/0=Debt Issue	1=Equity Issue/0=Debt Issue	1=Equity Issue/0=Debt Issue
Intercept	2.159	2.164	5.491
	(0.000)	(0.000)	(0.000)
High Kink	0.115 [0.020]	_____	
	(0.394)		
Log of total assets	-0.503 [-0.206]	-0.470 [-0.172]	-1.141 [-0.386]
(t-1)	(0.000)	(0.000)	(0.000)
Average ROA from	-4.450 [-0.064]	-4.559 [-0.065]	-2.630 [-0.035]
(t-1 to t)	(0.000)	(0.000)	(0.086)
buy-and-hold stock	0.499 [0.119]	0.432 [0.109]	0.507 [0.152]
return from (t-1 to t)	(0.000)	(0.000)	(0.000)
Market-to-book	0.227 [0.038]	0.229 [0.031]	0.183 [0.038]
(t-1)	(0.000)	(0.003)	(0.067)
Debt to assets (t-1)	0.619 [0.019]	0.644 [0.024]	-0.359 [-0.008]
	(0.030)	(0.010)	(0.639)
Year Dummies	Yes	Yes	Yes
N	3,982	3,259	723

Table 10. Panel A. Announcement period returns around equity issues. The table reports the three day announcement period cumulative abnormal returns (CARs) around equity issues for subsamples of firms based on whether the firm is in the high kink group in the year of issuance. A firm is classified in the high kink group if its kink measure as defined in Graham (2000) is in the top quartile of firms in that year. Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline. Equity issues are defined using Securities Data Corporation's New Issues Database. Abnormal returns are calculated relative to the market model estimated over the period beginning 200 days prior to the issue announcement and ending 50 days prior to the issue announcement.

	Low Kink	High Kink	p-value for difference in means (medians)
Mean CAR {-1,1} for all equity issues	-0.0237 N=1,716	-0.0266 N=563	0.255 (0.167)
Mean CAR {-1,1} for primary equity issues only	-0.0260 N=1,328	-0.0287 N=403	0.334 (0.214)

Panel B. Regressions of announcement period CARSof equity issuers on various explanatory variables for equity issuers. T-statistics in parentheses.

Variable	CAR {-1,1}	CAR {-1,1}
Intercept	-0.02455 (-14.03)	-0.02201 (-5.9)
High Kink	-0.0039 (-1.51)	_____
Proceeds/Market value of equity	-0.0026 (-0.82)	-0.00154 (-0.48)
Market-to-book	_____	0.00185 (1.65)
Cash to Assets	_____	-0.01967 (-2.16)
Return on Assets	_____	-0.02055 (-1.75)
Debt to assets	_____	-0.00706 (-1.11)
Secondary offering dummy	0.008 (2.99)	0.0081 (2.97)
R^2	0.0048	0.0008

Table 11. Pooled time-series cross-section regressions of capital expenditures on various control variables. The dependent variable is the ratio of capital expenditures to total assets in year t. High kink is an indicator equal to one if the firm is in the top quartile of kink in that year. Other independent variables include the ratio of cash flow, defined as operating income before depreciation minus interest expense minus taxes paid minus dividends paid, to total assets, the market-to-book-ratio, the ratio of cash to total assets, and the firm's sales growth rate from t=-1 to t=1. All of the independent variables are measured at year t and are deflated by total assets in year t-1. The regressions include firm and year fixed effects. The coefficient estimates from the regression are reported along with their associated p-values in parentheses.

Variable	Capital Expenditures to total assets	Capital Expenditures to total assets
High kink	0.004	-0.028
	(0.87)	(-7.69)
Cash flow/Assets	0.228	0.207
	(20.36)	(18.42)
High kink*(Cash flow/Assets)	0.127	0.268
	(5.27)	(12.32)
Market-to-book	0.032	0.025
	(25.75)	(24.08)
High kink*(Market-to-book)	-0.017	_____
	(-9.11)	
Cash/Assets	0.089	0.062
	(8.48)	(6.62)
High kink*(Cash/Assets)	-0.103	_____
	(-6.47)	
Sales growth	0.044	0.063
	(15.9)	(23.85)
High kink*(Sales growth)	0.192	_____
	(21.77)	
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
R^2	0.443	0.432

Table 12. Panel A. Frequency of takeover bids for high and low kink firms. The table reports the fraction of firms in the high and low kink groups that become targets of mergers and acquisitions. Merger and acquisition activity is compiled from Securities Data Corporation (SDC) over the period 1980-1995. SDC's definition of a hostile bid is used. The table also reports the p-value from a test of whether the frequencies of the various types of takeover bids are equal across the low and high kink groups.

Takeover type	Low Kink N=23,881	High Kink N=7,752	p-value for difference
All bids	0.0373	0.0224	0.000
Successful	0.0226	0.0132	0.000
Hostile	0.0053	0.0032	0.021

Panel B. Logistic regression for takeover bids. The dependent variable is equal to one if the firm receives a takeover bid in that year and is equal to zero otherwise. High kink is an indicator equal to one if the firm is in the top quartile of kink in that year. Other independent variables include the log of total assets, the market-to-book-ratio, the return on assets, and the firm's ratio of cash to assets relative to that of the median firm in the same three-digit SIC code. All of the independent variables are measured at year t-1. Indicator variables for the years 1981-1995 are included. The coefficient estimates from the Logistic regression are reported along with their associated p-values in parentheses. The reported p-values are adjusted for heteroscedasticity and for clustering within firms. Reported in brackets are the estimated changes in the probability of issuing securities corresponding to a one standard deviation change in the independent variable. When the independent variable is an indicator we report the change in the probability of issuing securities corresponding to a change in the value of the indicator variable from zero to one.

Variable	Takeover bid=1/No bid=0		Takeover bid=1/No bid=0	
Intercept	-3.608		-3.661	
	(0.000)		(0.000)	
High Kink	_____		-0.450	[-0.012]
			(0.000)	
Log of total assets	0.004	[0.000]	0.004	[0.000]
	(0.823)		(0.854)	
Market-to-book	-0.109	[-0.009]	-0.048	[-0.004]
	(0.076)		(0.430)	
ROA	-0.343	[-0.001]	0.073	[0.000]
	(0.403)		(0.890)	
Cash to Assets relative to 3-digit	-1.168	[-0.004]	-0.922	[-0.003]
industry median	(0.000)		(0.004)	
Year Dummies	Yes		Yes	
N	31,630		31,630	

Table 13. Panel A. Summary statistics of ownership by officers and directors in high and low kink firms. A firm is classified in the high kink group if its kink measure as defined in Graham (2000) is in the top quartile of firms in that year. Kink measures the amount by which the firm could increase its current interest expense without losing any tax benefits associated with interest deductions in expectation. Thus, a firm with a kink of 2.0 could double its current interest expense before its expected marginal tax rate begins to decline. Ownership data comes from Compact Disclosure and covers the years 1990-1995. The sample contains 11,432 firm years between. The table also reports the average p-values across years and the percentage of years with significant test statistics at the 0.1 level in parentheses for tests of differences in the variables across high and low kink firms.

Variable	Low Kink Firms N=8,544 Mean (Median)	High Kink Firms N=2,888 Mean (Median)	Anova p-value for differences	Wilcoxon p-value for differences
Fractional stock ownership of officers and directors	0.179 (0.099)	0.158 (0.088)	0.216 (0.625)	0.338 (0.250)

Panel B. Summary statistics of CEO turnovers in low and high kink firms. The data comes from the Forbes compensation surveys as assembled by Huson, Parrino, and Starks (2000). The sample contains 5,687 firm years between 1980 and 1995. There are 513 CEO turnovers in the sample. The rate of forced turnover is computed conditional on turnover occurring. CEO age is the age of the incumbent CEO in the year prior to turnover.

Variable	Low Kink Firms N=4,234 Mean (Median)	High Kink Firms N=1,453 Mean (Median)	Anova p-value for differences	Wilcoxon p-value for differences
Rate of CEO turnover	0.092 (—)	0.085 (—)	0.392	____
Rate of forced CEO turnover conditional on turnover occurring	0.148 (—)	0.138 (—)	0.772	____
CEO age	56.48 (57)	56.19 (57)	0.176	0.280

Figure 1. Debt Ratios of Debt Issuers

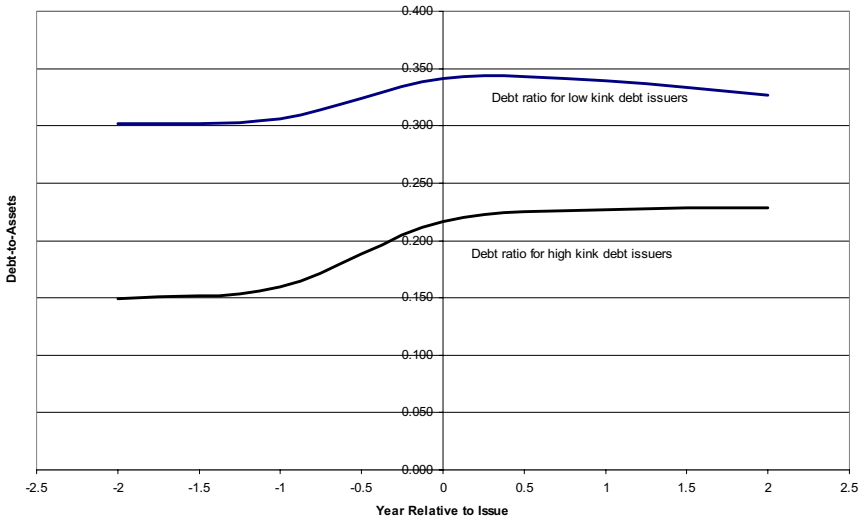

Figure 2. Liquidity Ratios of Debt Issuers

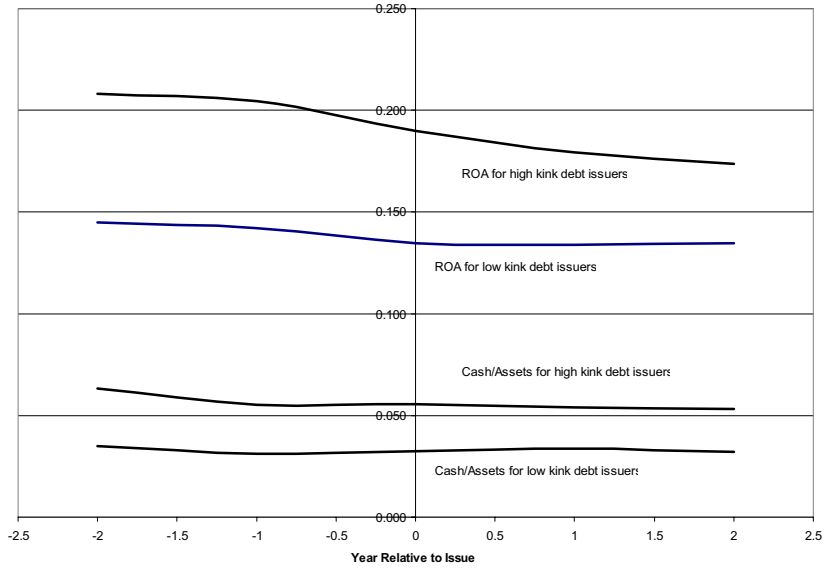

Figure 3. Spending Ratios for Debt Issuers

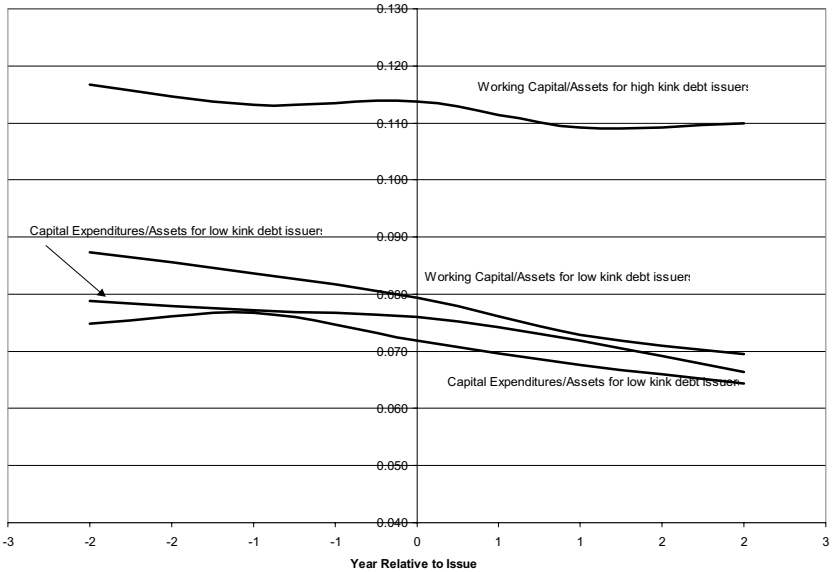

Figure 4. Debt Ratios of Equity Issuers

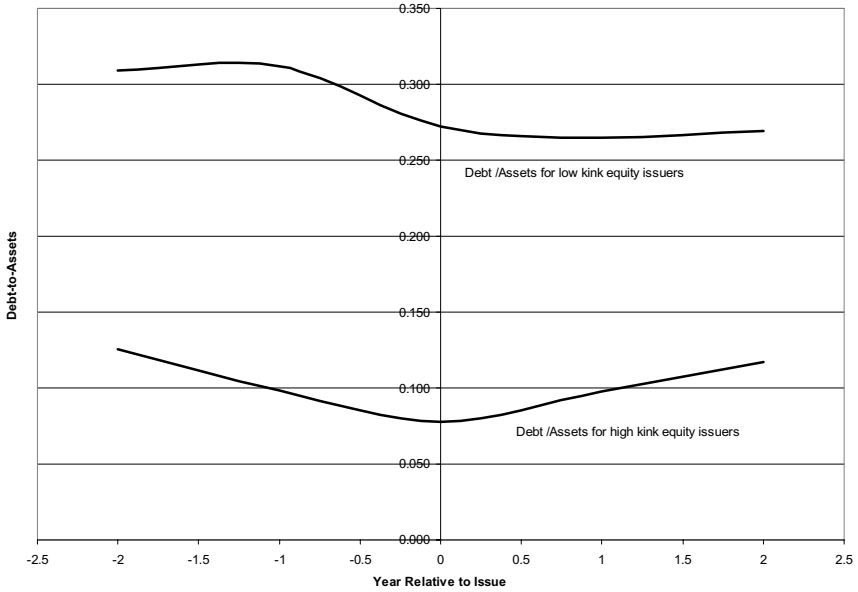

Figure 5. Liquidity Ratios for Equity Issuers

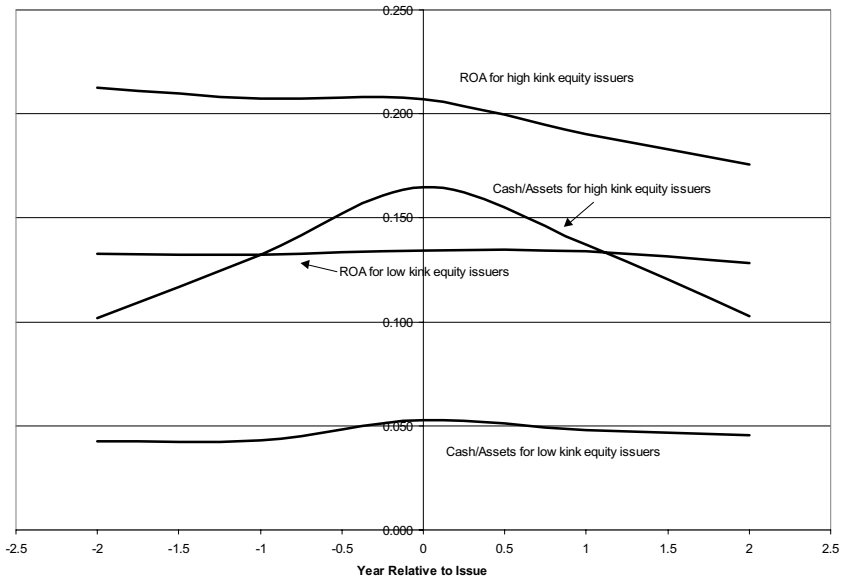

Figure 6. Spending Ratios for Equity Issuers

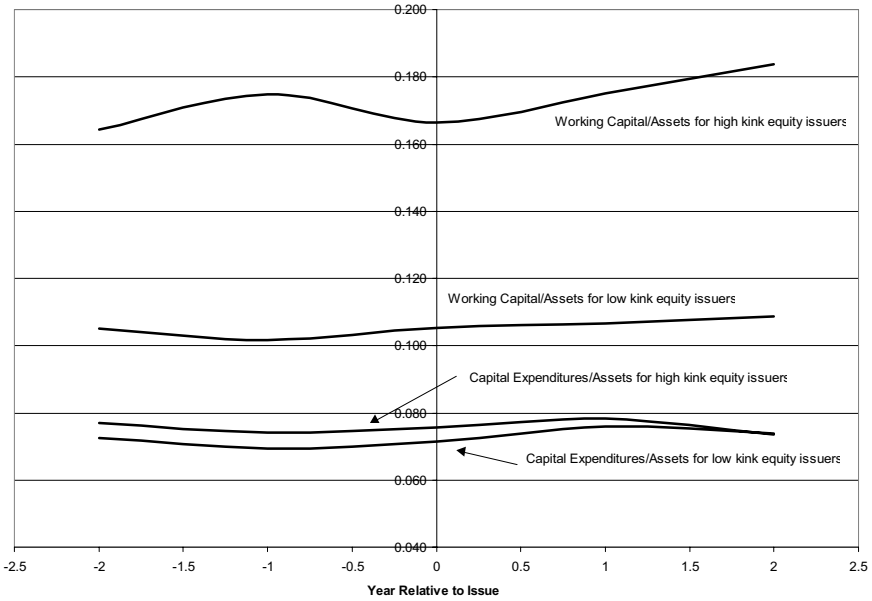

Figure 7. Mean Debt Ratios Around Shocks To Managerial Entrenchment