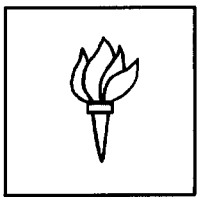

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Managerial Entrenchment and Capital Structure Decisions.

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Managerial Entrenchment and Capital Structure Decisions

Abstract

We test the prediction that leverage is inversely associated with managerial entrenchment. We examine leverage levels and year-to-year changes for several hundred firms between 1984 and 1991. We find that leverage levels are positively related to CEO stock ownership and CEO stock option holdings, and negatively related to CEO tenure and board of directors size. While generally consistent with less entrenched CEOs pursuing more leverage, these results are subject to alternative interpretations. We therefore analyze year-to-year changes in leverage around exogenous shocks to corporate governance variables. We find that leverage increases after unsuccessful tender offers and "forced" CEO replacements, and under certain conditions after the arrival of major stockholders. These relations have greater magnitude when the sample is restricted to low-leverage firms, even when 80% of firms are defined as low-leverage. The results are consistent with decreases in entrenchment leading to increases in leverage, and with the majority of firms having less debt than optimal.

Capital structure research during the past 20 years has been greatly influenced by Jensen and Meckling's (1976) insight that firms' choices about leverage depend upon the agency costs arising among managers, equityholders, and debtholders. In an extension of this argument, Jensen (1986) touts the potential of high debt levels for reducing agency costs, reasoning that because debt commits firms to disgorge fixed amounts of cash, it constrains managers from diverting "free" cash flow to pursue personal goals at the expense of value maximization.[1] Theories based on this view assume that managers will not adopt capital structures with optimal levels of debt unless pressured to do so by a "disciplining" force. While the mechanisms of corporate governance in public companies, including the market for corporate control, are expected to serve as sources of managerial discipline, they often lack the strength to overcome the power of an entrenched manager who successfully insulates himself from external pressure. Following these theories, our paper predicts that leverage is negatively associated with the degree of managerial entrenchment in a firm.[2] We test our hypothesis by analyzing leverage levels and year-to-year changes in leverage for a sample of several

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[1] This view underlies the models of Grossman and Hart (1982), Stulz (1990), Hart and Moore (1990) and Hart (1993). Related models by Williamson (1988) and Harris and Raviv (1990) consider the possibility that debt may force managers to liquidate inefficient operations. See Harris and Raviv (1991) for an extensive survey of capital structure models.

[2] Note that our prediction is based on the level of managerial entrenchment being exogenous and owners attempting to impose value-maximizing leverage on managers. Zwiebel (1994) presents a model in which entrenchment is determined endogenously. His model leads to very different predictions than ours, namely that managers of the best-performing firms engage in the greatest degree of empire building, and that managers adopt increasing debt levels as their tenure increases.

thousand firm-year observations between 1984 and 1991.

We examine both levels and changes of leverage because of our uncertainty that analysis of levels alone is sufficient to document cause-and-effect associations with variables related to managerial entrenchment. Variables such as leverage and firm value may be determined simultaneously, permitting several interpretations of cross-sectional associations. Further, as MacKie-Mason (1990) notes, debt/equity ratios represent the cumulative result of years of separate decisions, meaning that tests based on a single aggregate of different decisions are likely to have low power. Therefore, we feel that agency-based models of leverage may be better studied by analyzing security issue choices rather than the cross-sectional variation in debt/equity ratios.[3]

Much empirical research into capital structure has examined only the levels of leverage across companies. Consistent with several agency models of capital structure, a number of papers have documented a positive association between leverage and firm value.[4] The problems with attempting to explain variation in debt/equity ratios have motivated numerous studies of the stock price reaction to announcements of security issuance and redemption. These studies generally find that leverage-decreasing announcements such as equity issues meet with a negative reaction, whereas leverage-increasing announcements such as debt-for-equity exchanges and stock repurchases meet with a positive reaction.[5] When debt is issued with no contemporaneous change in equity, however,

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[3] See Jung, Kim, and Stulz (1995) for an elaboration of this view.

[4] Models predicting a positive association between leverage and firm value include Hirshleifer and Thakor (1989), Harris and Raviv (1990), and Stulz (1990). Empirical results on this issue, all of which support the predicted positive association, are provided by Lys and Sivaramakrishnan (1988), Cornett and Travlos (1989), Dann, Masulis, and Mayers (1989), and Israel, Ofer, and Siegel (1989).

[5] See, for example, Masulis (1980, 1983), Cornett and Travlos (1989), Dann (1981), Vermaelen (1981), Dann et al. (1989), Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986), Schipper and Smith (1986),

there is little support for a positive reaction to the leverage increase.[6] In addition, positive stock price reactions to leverage-increasing issuances or redemptions are just as consistent with the predictions of certain asymmetric information models as they are with agency models.[7]

The inferential difficulties arising from using either leverage levels or event reactions as a dependent variable have led to recent studies examining determinants of security issue choice. MacKie-Mason (1990) studies the effect of marginal tax rates on security issue decisions. Opler and Titman (1994) find that firms appear to issue equity or debt in order to move toward a long-run target capital structure. With respect to the predictions of agency and pecking-order models, Jung, Kim, and Stulz (1995) find that a significant portion of equity issuers are firms that have poor investment opportunities but have not exhausted their debt capacity. These firms also invest more than similar firms issuing debt. Their results thus support the notion that the agency costs of managerial discretion lead certain firms to issue equity when debt issuance would maximize firm value.

Our paper builds on the idea that agency costs of managerial discretion affect leverage choices, leading managers to substitute equity for debt under certain conditions. If this conjecture is true, then exogenous changes in the parameters of corporate governance may lead to changes in leverage. Like its capital structure counterpart, the corporate governance literature contains many competing theories. Therefore, documenting significant relations between changes in corporate

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and Eckbo (1986).

[6] Kim and Stulz (1988) find a significantly positive average abnormal stock price reaction to debt issue announcements, whereas Dann and Mikkelson (1984), Eckbo (1986), and Mikkelson and Partch (1986) do not.

[7] The asymmetric information models of Ross (1977), Noe (1988), Narayanan (1988), and Poitevin (1989) predict stock price increases on announcement of leverage-increasing net security issuances.

governance and changes in capital structure can shed light on both the role of agency costs in leverage choices and the effectiveness of various corporate governance mechanisms for reducing agency costs. After beginning by documenting relations between the levels of various corporate governance variables and firms' debt/equity ratios, we therefore devote most of our analysis to exploring associations between exogenous changes in corporate governance variables and changes in firm leverage.

Our levels analysis, after controlling for non-agency determinants, shows leverage to have significantly positive associations with CEO direct stock ownership and CEO stock option holdings. Although we are hesitant to draw strong inferences from the levels analysis, the ownership results are consistent with CEOs whose incentives are better aligned with shareholders' pursuing more levered capital structures. We find significantly negative associations between leverage and both CEO tenure and board of directors size. The negative association with tenure is consistent with entrenched CEOs pursuing less levered capital structures. The negative relation between leverage and board size is consistent with recent research suggesting that CEOs face more active monitoring, and therefore are less entrenched, when boards of directors are small.

Since many of the associations between leverage and the agency cost variables are subject to multiple interpretations, we place greater weight on our analysis of changes in leverage. We find significant increases in leverage following unsuccessful tender offers, forced CEO replacements, and the addition of a 5% blockholder to the board in the same year that a CEO is replaced. We do not find significant changes in leverage following unforced CEO replacements or the addition of a 5% blockholder to the board that is not accompanied by CEO replacement in the same year.

In response to unsuccessful tender offers, net debt issued and equity repurchased both

increase markedly, while new equity issued also increases, albeit less substantially. These components of the leverage increase are consistent with managers responding to pressure to increase firm value by both increasing net debt and decreasing net equity. The net debt increase could, however, also be a defensive response that enhances entrenchment, and the large stock repurchases could represent value-decreasing greenmail payments.

Forced CEO replacements are followed by leverage increases arising from a secular increase in net debt issuance. New CEOs who arrive in the same year as a new 5% blockholder also increase leverage in a similar manner. In both of these types of CEO turnover, the new CEO is likely to have relatively low job security and to face relatively close board scrutiny. Therefore, the leverage increases that follow are consistent with decreases in managerial entrenchment leading to higher leverage.

We explore our results further by examining the effect of threats to entrenchment upon leverage within a subsample of previously underlevered firms. For all three threats to entrenchment that we study, we find that the leverage increases following the events are more important economically and statistically for underlevered firms than they are for all firms. These results support the importance of agency costs in capital structure decisions, since managers of firms with low leverage *ex ante* should face especially strong pressure to increase leverage after an event that poses a threat to managerial entrenchment.

Section I presents our analysis of leverage levels, including sample selection, variable construction, and empirical results. Section II presents similar information for the changes analysis. We summarize the results and offer conclusions in section III.

I. Analysis of Capital Structure Levels

In this section we analyze companies' relative levels of leverage as a function of important corporate governance variables. Section I.A discusses the sample selection procedure. Section I.B describes the main dependent and control variables. Many of our controls are similar to those used by the study of cross-sectional leverage by Titman and Wessels (1988). Section I.C describes our empirical results.

A. Sample Selection

Our analysis uses a dataset of 452 industrial companies between 1984 and 1991 assembled by Yermack (1996). The panel is drawn from annual *Forbes* magazine rankings of the 500 largest U.S. public corporations based on sales, total assets, market capitalization, and net income. The sample selection rule requires each company to qualify for at least one *Forbes* list during at least four years of the 1984-91 period, with companies allowed to enter and exit the panel over time. We merge corporate governance and equity ownership data gathered from company proxy statements with accounting data drawn from the Compustat database. Financial firms (SIC codes 6000 through 6999) and utilities (SIC codes 4900 through 4999) are excluded from our analysis due to the marked differences in leverage and corporate governance between those industries and other sectors of the economy. Because some companies have missing values or have been deleted from Compustat, our final sample consists of 3,135 observations for 435 firms over eight years.

B. Variables for Analysis of Leverage Levels

Table I lists the major dependent and explanatory variables for our analysis of company

leverage levels. We measure the level of leverage at the end of each fiscal year using two continuous variables that take values between 0 and 1:

$$Leverage\ (book\ value) = \frac{total\ debt\ (book\ value)}{total\ assets\ (book\ value)} \quad (1)$$

$$Leverage\ (market\ value) = \frac{total\ debt\ (book\ value)}{total\ debt\ (book\ value) + common\ equity\ (market\ value)} \quad (2)$$

To assess the influence of CEO entrenchment and control upon capital structure choice, we include in our regression models several variables widely used in corporate governance studies. Most of these variables are reported in proxy statements filed in advance of firms' annual shareholder meetings, which usually occur in the fourth or fifth month of each fiscal year.

Mørck, Shleifer, and Vishny (1988) and other authors have identified managerial equity ownership as an important influence upon firm value. We therefore include several variables related to the stock ownership of officers and directors: CEO direct stock ownership, CEO holdings of vested stock options, and the stock ownership of officers and directors excluding the CEO. The CEO stock ownership variable is disaggregated into two pieces, representing direct stock ownership and holdings of exercisable stock options, in order to capture any difference in the influence of these two variables upon leverage choices.

Several studies, such as Weisbach (1988), indicate that top managers face more active monitoring when the board of directors is controlled by independent or outside directors. To capture the importance of this effect, we include a variable measuring the percentage of the board comprised of outside directors. The variable excludes "grey" directors who have personal business relationships with the company or are relatives of current or former officers.

A variable measuring the CEO's years in office is included to reflect the possibility that a CEO's control over internal monitoring mechanisms likely increases as his tenure lengthens. We use the natural log of this variable in our models, in the belief that CEO power over corporate governance due to the passage of time will increase at a decreasing rate.

The size of the board of directors has been identified as an important determinant of corporate governance effectiveness in theoretical papers by Lipton and Lorsch (1992) and Jensen (1993). An empirical study by Yermack (1996) shows that CEO disciplinary mechanisms related to compensation and the threat of dismissal lose power as board size increases. We therefore include board size in our models as a further measure of CEO entrenchment, again using a log specification in the belief that the costs associated with expanding the board will increase at a decreasing rate.

In addition to these corporate governance variables, we include in our models standard control variables for other firm attributes expected to influence leverage. To control for company profitability, we use a return on assets (ROA) variable defined as earnings before depreciation, interest, and taxes (EBDIT), divided by total assets at the start of the year. We measure company size by using the book value of assets in place (the log of total assets).[8] We control for non-debt tax effects by using the ratio of investment tax credits over total assets. The nature of assets is measured by the ratio of net property, plant, and equipment over total assets; firms with large growth opportunities and less collateral value should have lower fractions of tangible assets in place.

Table I gives the definitions of dependent and explanatory variables, along with sample-wide means and standard deviations.

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[8] No material change occurs in our results if we reestimate our models using a market value measure of firm size (the log of the sum of the market value of equity plus the book value of total debt).

C. Regression Results

We estimate ordinary least squares (OLS) regressions of our two leverage variables against the range of explanatory variables introduced above. The left columns of Table II present these coefficient estimates, with t-statistics displayed below each estimate in parentheses. Few substantive differences appear to exist between the models using the book value and market value estimates of the dependent variable. Because of concerns that observations drawn repeatedly from the same sample of firms may not be independent, we also estimate our model using the within-firm, time-series average values of each variable. The right columns of Table II present the results of these estimations, which are largely consistent with those from the pooled models. As a further check, we estimate separate year-by-year regressions of our models, and our results (not reported) are largely consistent with those shown in Table II and discussed below.

Although the estimates generally support our hypothesis that entrenched CEOs will pursue capital structures with less leverage, we are hesitant to draw strong conclusions from them, since many competing theories about corporate governance lead to contradictory predictions about how companies should design their capital structures in order to reduce agency costs and increase firm value. Moreover, many of the variables in our models of leverage levels are likely determined simultaneously, making it difficult to ascertain cause-and-effect relations from estimated regression coefficients.

Our regressions show marked positive associations between firm leverage and CEO stock ownership, for both directly owned shares and stock options. These results are consistent with an interpretation that CEOs whose financial incentives are more closely tied to stockholder wealth will pursue more levered capital structures to raise the value of the company. The association between

leverage and option holdings appears to have strength that is an order of magnitude greater than the association between leverage and direct stock ownership; F-tests indicate that estimated regression coefficients on option holdings are significantly different from those on direct stock ownership in all four models for which we report results. Our overall findings for managerial equity ownership match Friend and Lang's (1988) conclusion about the association between managerial ownership and leverage in companies with diffuse ownership and no dominant outside shareholder, characteristics that probably describe well most of the firms in our sample. Our finding that leverage is higher when CEOs have large holdings of stock options is not surprising, because the value of options is positively related to the variability of cash flows received by equityholders. Since higher leverage implies a greater volatility of cash flows to equity, managers holding options have clear incentives to add debt to their capital structures. However, our result is not consistent with Smith and Watts' (1992) industry-level finding of a negative correlation between leverage and the incidence of stock option plans. They attribute the result to the presence of investment opportunities, since firms with large growth opportunities are likely to have low leverage (Myers, 1977) and are also likely to compensate managers with equity instruments. Because our study controls for the presence of growth opportunities by including a variable for asset tangibility (property, plant and equipment over total assets), we should not necessarily expect to find the same relation between leverage and managerial option holdings as Smith and Watts.

An additional characteristic of the CEO, his tenure in office, has a negative estimated association with the level of leverage. These estimates are consistent with entrenched CEOs pursuing capital structures with lower leverage, perhaps to reduce the performance pressures that accompany high debt levels. However, as is the case for many of the variables in this model, the

result supports alternative interpretations. For example, it is possible that CEO tenure is positively correlated with managerial quality or skill. High-quality CEOs may have presided over many profitable years in which retained earnings accumulated at an above-average rate, resulting in capital structures with high equity.

Board size has a negative estimated association with leverage. If CEOs with small boards are less entrenched due to the superior monitoring of these bodies, an inverse association between board size and leverage is consistent with the prediction that entrenched CEOs will pursue capital structures with less leverage. However, estimates for board size are not quite statistically significant when our models are estimated using the time-series, within-firm averages of each variable, as shown in the right columns of Table II.

According to one of our four specifications, when officers and directors other than the CEO have high amounts of equity ownership, firms tend to have capital structures with significantly lower leverage. It is not obvious why CEO equity ownership should be positively associated with leverage while the opposite relation holds for the remaining members of the board. The result is consistent with a theory that directors monitor very actively when they hold large personal equity stakes, thereby making the additional pressure of leverage unnecessary. See John and John (1993), who develop further the conjecture that high debt levels and managerial equity ownership behave as substitute mechanisms for reducing agency costs.

Our financial control variables have signs in line with accepted theories of capital structure. Firm profitability is negatively related to leverage, which is consistent with successful firms accumulating greater retained earnings on their balance sheets. Firm size has a positive association with leverage, which is consistent with theories that large firms face lower expected costs of

financial distress. Companies with large non-debt tax shields have less leverage, which accords with their lower need for the tax benefits associated with interest payments. Firms with large amounts of tangible assets in place, as represented by the ratio of property, plant, and equipment over total assets, tend to have more levered capital structures, which is consistent with the theory of Myers (1977) and others that firms whose assets are largely intangible should rely mostly on equity finance.

As noted in the preceding discussion, many variables related to capital structure, firm performance, and corporate governance are likely determined simultaneously, making any analysis of cross-sectional levels difficult to interpret. Nevertheless, we interpret our analysis of capital structure levels as providing support for the hypothesis that leverage decreases with the degree of top managers' entrenchment. We find negative associations between leverage and two variables that may indicate the presence of entrenched managers: the CEO's tenure in office, and the size of the board of directors, though the latter effect holds in only two of our four specifications. Moreover, CEO equity ownership appears to be positively associated with leverage, implying that CEOs with direct interests in maximizing firm value will use significantly greater amounts of leverage.

II. Analysis of Changes in Capital Structure

Because of the difficulties involved in interpreting our models of relative leverage levels, we turn to an analysis of changes in capital structure in the belief that this type of model can more convincingly show cause-and-effect relations between corporate governance variables and firm leverage. Our research strategy is to study whether leverage changes significantly around the time of events that appear to represent exogenous shocks to companies' corporate governance structures. Section II.A discusses the variables used in our analysis. Section II.B presents estimates for

regression models of changes in leverage. Section II.C presents estimates of the same models over a sub-sample of firms that appear *ex ante* to have low levels of leverage.

A. Variables for Analysis of Changes in Leverage

Key dependent and explanatory variables for our analysis of changes in firm leverage appear in Table III. We measure changes in the debt and equity components of leverage with the following variables, all based on annual flow of funds data obtained from Compustat:

$$Net\ issuance\ of\ debt = \frac{debt\ issued - debt\ retired}{total\ assets} \tag{3}$$

$$Equity\ issued = \frac{new\ equity\ issued}{total\ assets} \tag{4}$$

$$Equity\ repurchased = \frac{equity\ repurchased}{total\ assets} \tag{5}$$

The variables in equations 3, 4, and 5 are combined into a single variable measuring the net change in leverage over the course of a fiscal year. The variable is constructed so that an increase in leverage is indicated by a positive value:

$$Net\ leverage\ change = \frac{net\ debt\ issued - equity\ issued + equity\ repurchased}{total\ assets} \tag{6}$$

Total assets is measured at the start of the year for all of the dependent variables. Approximately one-sixth of our observations have missing values on Compustat for one or more of the flow of funds variables needed to form our dependent variables. Dropping these observations from the analysis leaves us with a sample of 2,634 observations from 419 companies.

Related prior studies of capital structure changes have relied on data from the SEC's Registered Offerings Statistics (ROS) tape. For several reasons we prefer working with Compustat data instead.[9] The ROS tape does not capture important events related to changes in leverage, such as stock repurchases, retirements of debt, issues of non-public debt (especially bank debt), and issuances of new equity for such events as mergers and acquisitions. It is also difficult to construct continuous variables from data on the ROS tape, since the amount of funds actually raised from the offerings listed on the tape are generally less than the amount registered with the SEC. Finally, time lags of varying length exist between the dates on which securities issues are registered with the SEC and actually sold to the public. Although the flow-of-funds data from Compustat overcome many of these problems, they also raise some concerns. Some capital structure changes occur as the result of actions by outside claim holders, such as the exercise of stock options or warrants or the conversion of convertible debt into equity. Because our analysis seeks to isolate capital structure changes that occur because of managerial choices, the Compustat data will capture some extraneous information that we would have liked to ignore.

To investigate whether leverage changes are related to exogenous changes in the degree of managerial entrenchment and control, we require explanatory variables that one would expect to be associated with discrete, meaningful changes in the security of top management. We identify several corporate governance events that typically indicate a significant threat to managerial security: an outside offer to acquire the firm; the replacement of the company's CEO; and the arrival of a new

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[9] Opler and Titman (1994) also use Compustat flow of funds data to identify changes in leverage. Their study does not, however, use continuous dependent variables, but rather indicator variables that equal one if a firm's annual debt or equity issuance exceeds 5% of total assets.

major holder of the company's stock. We use our corporate governance data to construct variables that reflect these three events.

We use the Lexis data retrieval system to search the database of *Investment Dealer's Digest* for reports of unsuccessful tender offers made between 1984 and 1991 for our sample companies. We expect that managers will feel great pressure to raise the value of the firm in such situations, if only to reduce the likelihood of subsequent tender offers. We construct an indicator variable for unsuccessful tender offers and set it equal to one if an offer that subsequently fails is made during a fiscal year (when the offer occurs in the final month of a fiscal year, the variable is set equal to one for the following year's observation instead).

A new CEO should have relatively low job security, particularly in those cases when the board has acted to remove his predecessor. We create an indicator variable for new CEOs that equals one if the predecessor CEO left during the last six months of the prior year or the first six months of the current year.

The appearance of a major holder of the company's stock may portend pressure for management to instigate value-increasing changes or face the threat of replacement. We create an indicator variable for the initial appearance of a 5% blockholder, setting the variable equal to one if the company has no 5% stockholders listed in its proxy statement for the prior year and at least one 5% stockholder in the current year (excluding employee stock ownership plans).

Control variables for our regressions analyzing changes in leverage are similar to those used to study the level of leverage. We add several additional explanatory variables so that our model's specification is similar to those of two other studies: MacKie-Mason's (1990) investigation of how changes in leverage are related to differences in marginal tax rates, and Jung, Kim and Stulz's (1995)

study of how financing decisions are related to investment opportunities and agency considerations. Our additional control variables are the ratio of a firm's market value over book value, its leverage at the start of the year, its stock return during the year, and the ratio of net operating loss carryforwards (as reported by Compustat) over total assets. We define the market-to-book ratio as the market value of equity, plus the book value of total assets, minus the book value of equity, all divided by the book value of total assets. We also include fixed factors for each year in our model in order to capture macroeconomic influences.

B. Regression Results

Table IV presents OLS estimates for our model of net year-to-year changes in leverage. We show estimates for models using separately each of our explanatory variables that are intended to reflect sudden, exogenous threats to managerial security.

We find sizeable, significant increases in leverage occurring in years that firms face unsuccessful tender offers. As shown by the regression coefficient in the first column of Table IV, unsuccessful tender offers are followed by increases in book leverage on the order of 17% of total assets. Table V provides a more detailed look at how the components of leverage change. The table shows estimated regression coefficients for models where the dependent variables are the net change in debt, issuances of new equity, and repurchases of equity. Estimates in the first row of Table V suggest that firms that defeat takeover attempts become heavy purchasers of their own stock, at an average level of 7% of total assets, with these buybacks apparently financed by new debt, which is issued in an average amount of 13% of total assets. The rise in debt after an unsuccessful offer is consistent with Ofek's (1994) finding that debt increases after unsuccessful management buyouts.

Interestingly, some of the firms experiencing unsuccessful tender offers also appear to issue equity, as the estimated coefficient for equity issuances is positive and significant at around 2.6% of total assets, which represents a far lower magnitude than the coefficients for the other two leverage components.

While the results provide evidence of increases in leverage after unsuccessful takeover attempts, several explanations of the pattern are possible. Along the lines of our arguments in the rest of this paper, we favor a theory that managers are pressured by tender offers to take dramatic steps that increase firm value, with increased leverage representing one common move that outsiders generally favor and managers would prefer to avoid due to the resulting performance pressure. However, one could also view higher leverage after unsuccessful tender offers as a type of "scorched earth" tactic in which managers lever the firm as a defensive measure that ultimately enhances, rather than undermines, their entrenchment. The heavy repurchases of stock after unsuccessful tender offers could also represent greenmail payments that lower firm value and increase managerial entrenchment.

Our preferred interpretation, that the leverage increases after unsuccessful tender offers represent attempts to increase firm value, is supported by results in Safieddine (1995). Analyzing 573 firms that were targets of unsuccessful takeovers between 1982 and 1991, Safieddine finds significant increases in leverage after the takeover attempt, as well as a positive relation between the change in leverage and subsequent operating performance and stock returns.

The replacement of a company's CEO does not appear to lead to greater leverage, as the coefficient on this variable in the second column of Table IV is close to zero and not significant. However, interpretation of this result is clouded by the likelihood that many CEO departures are

voluntary and do not represent unexpected disturbances to corporate governance. For this reason, we seek to narrow our sample of CEO replacements to those that are likely to have been involuntary. We focus on the subsample of exiting CEOs who are age 62 or less and do not remain on the company's board of directors after his departure. We assume that most of these departures are involuntary and label them as "forced" episodes of CEO turnover. As shown by the third column of Table IV, leverage rises significantly, by about 5% of total assets, in years following the forced departure of a CEO, and Table V suggests that a secular increase in new borrowing explains most of this change.

We find no significant association between the arrival of an initial 5% stockholder and changes in leverage, as shown by the insignificant estimate for this variable in the fourth column of Table IV. Again, we suspect that this variable captures many events that may not represent exogenous threats to the security of management, and we seek to narrow the variable to a more pertinent set of events related to major stockholders. We define an indicator variable for the appearance of a new 5% blockholder on the board of directors; this variable equals one when the number of 5% stockholder-directors increases by at least one compared to the prior year. We also create an interaction term between the new board blockholder variable and the new CEO variable; the resulting indicator variable equals one if the CEO is replaced during the same year that a new 5% blockholder appears on the board.

Our new variables give some indication of a connection between greater leverage and the arrival of a powerful stockholder. When the number of 5% stockholder-directors rises by one, leverage increases by an average of 2.5% of total assets, as shown in the fifth column of Table IV, although the estimate is not quite significant at the .10 level ($t = 1.60$). Table V indicates that these

firms issue significant amounts of new debt. In years when the number of 5% stockholder-directors rises by one *and* the CEO is replaced (whether voluntarily or involuntarily, according to our definition), the change in leverage appears to be dramatic. The right column of Table IV indicates that leverage rises by about 9% of total assets. Table V indicates that this effect is largely due to new issues of debt, although significant amounts of equity are also issued by this group of firms.

C. Underlevered Firms

We check the robustness of our results by identifying a subsample of firms that appear to have low leverage *ex ante*. CEOs of these companies should face especially strong pressure to add debt in the aftermath of an event that poses a threat to managerial security, since these companies are likely to have borrowed less than their optimal debt capacities. We divide our original sample by comparing companies' book values of leverage to predicted values generated by an OLS model. The specification of the model generating predicted values is identical to the model described by the first column of Table II, except that we exclude the corporate governance and stock ownership variables listed in the first six rows of the table.

For those companies whose leverage falls below the predicted level (approximately half the sample), we reestimate the regressions for leverage changes reported in Table IV. Results from the reestimation on the low-leverage subsample are shown in Table VI. As expected, the tendency of CEOs to add leverage in response to diminished entrenchment has uniformly stronger magnitude in relation to all six of our main explanatory variables, and five of the six key coefficients indicate statistically significant increases in leverage. The magnitude of the coefficient estimates is roughly twice as high over the sample of low-leverage firms as compared to the coefficient estimates for all

firms. We conclude that when firms have pursued a low-debt capital structure in the past, an outside event that threatens managerial security is an especially strong predictor of increased leverage.

A further check on this finding appears in Table VII, in which we again estimate our regressions for the change in leverage over a subsample of firms with low *ex ante* levels of debt. In this case, we partition the sample based on whether the book value of debt over total assets is less than 0.35. For this subsample, which includes about four-fifths of our observations, we again find uniformly stronger increases in leverage in response to events that threaten managerial entrenchment, compared to the leverage increases that we observe across the entire sample. The estimated coefficients on our key dependent variables have considerably larger magnitudes than the coefficients estimated over the entire sample. Since the subsample analyzed in Table VII includes a large majority of the firms in our universe, the results suggest that most firms are probably underlevered relative to their optimal capital structures.

III. Conclusions

Theories based on Jensen's (1986) argument that leverage reduces managerial discretion implicitly assume that managers will not issue the optimal amount of debt unless pressured to do so by a "disciplining" force. We therefore predict that decreasing managerial entrenchment results in higher leverage.

We examine cross-sectional relations between leverage levels and corporate governance variables. We find that leverage is positively related to CEO direct stock ownership and CEO stock option ownership, while leverage is negatively related to CEO tenure and the size of the board of directors. These results are consistent with CEOs who are less entrenched, or whose interests are

more aligned with shareholders', pursuing more levered capital structures. The results are open to other interpretations, however, and in one model we find a negative relation between leverage and non-CEO officer and director ownership, which appears inconsistent with our other results.

To improve our insight into the cause-and-effect relations between corporate governance variables and leverage, we investigate whether leverage increases significantly around the time of events representing exogenous shocks to companies' corporate governance structures. We find that book leverage increases by an average of about 17% of assets when firms are targets of unsuccessful tender offers. This result is consistent with increased leverage being generally value-enhancing, yet shunned by managers who prefer to avoid the resulting performance pressure. Increasing leverage in response to an unwanted tender offer might, however, represent a "scorched earth" tactic in which managers lever the firm as a defensive measure.

The replacement of a company's CEO does not lead to greater leverage when all CEO turnover events are analyzed. However, if the turnover appears "forced" because the exiting CEO is under age 62 and does not remain on the board of directors, leverage rises by about 5% of total assets following the replacement. Similarly, for CEO replacements that occur in the same year that the number of major stockholder-directors increases, leverage rises by about 9% following the replacement. For both of the subsets of CEO turnover that we examine, the new CEO is likely to have relatively low job security and face close board scrutiny. The leverage increases that follow these instances of CEO replacement are thus consistent with decreases in managerial entrenchment leading to increases in leverage.

We check the robustness of our results by analyzing two subsamples of firms that have low leverage *ex ante*. These companies are more likely than the total sample to have borrowed less than

their optimal level. As expected, the leverage increases in response to diminished entrenchment are larger for the subsamples of firms with low *ex ante* leverage. Our findings hold even when a relatively small number of highly-levered firms (only the top quintile) are dropped from the analysis. We interpret this pattern of results as indicating that a large majority of firms have leverage below their value-maximizing levels.

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TABLE I

Variables for analysis of capital structure levels

Definitions and descriptive statistics for variables used in analysis of capital strucutre levels. The sample consists of 3,135 observations for 435 companies in the 1984-91 period. Financial staetment variables were obtained from Compustat, with balance sheet items defined as of the end of each fiscal year. Corporate governance and stock ownership variables were obtained from proxy statements generally filed by each company during the third or fourth month of its fiscal year.

Dependent variables	**Definition**	**Mean**	**Std. dev.**
Leverage (book value)	total debt (book value) / total assets	0.249	0.170
Leverage (market value)	total debt (book value) / (total debt (book value) + equity (market value))	0.267	0.203
Explanatory variables	**Definition**	**Mean**	**Std. dev.**
CEO direct stock ownership	shares held directly / shares outstanding	0.029	0.085
CEO stock option ownership	vested options held / shares outstanding	0.0017	0.0056
Officer and director stock ownership (excluding CEO)	(shares + vested options held) / shares outstanding	0.060	0.103
Board composition	% of outside directors	0.538	0.193
CEO tenure	log (years in CEO position)	1.834	0.970
Board size	log (number of directors)	2.463	0.292
Return on assets	earnings before interest, taxes and depreciation / total assets	0.189	0.104
Company size	log (total assets)	7.763	1.143
Non-interest tax shields	investment tax credits / total assets	0.0015	0.0069
Asset tangibility	property, plant & equipment / total assets	0.413	0.198

TABLE II

Regression coefficient estimates: Determinants of capital structure levels

OLS regression coefficients for models of capital structure levels. The sample consists of 3,135 observations for 435 companies in the 1984-91 period. Variable definitions appear in Table I. T-statistics appear in parentheses below each coefficient estimate. The left columns present pooled cross-sectional time series estimates for the entire sample, while the right columns present cross-sectional regressions using the time series mean values within each company.

Sample:	Pooled	Pooled	Within-firm averages	Within-firm averages
Dependent variable:	**Leverage (book value)**	**Leverage (market value)**	**Leverage (book value)**	**Leverage (market value)**
CEO direct stock ownership	0.137 ***	0.231 ***	0.198 **	0.335 ***
(% of common shares)	(3.69)	(5.82)	(2.06)	(3.21)
CEO vested option ownership	2.567 ***	3.054 ***	4.592 ***	4.700 ***
(% of common shares)	(5.16)	(5.75)	(3.09)	(2.90)
Officer and director stock ownership	-0.042	-0.088 ***	-0.084	-0.121
(% of shares, excluding CEO)	(1.45)	(2.82)	(1.23)	(1.62)
CEO tenure	-0.006 **	-0.013 ***	-0.016 *	-0.029 ***
(log (years in office))	(2.11)	(4.23)	(1.75)	(2.84)
Board composition (% outside)	0.0001	0.025	-0.036	-0.006
(% outside directors)	(0.01)	(1.47)	(0.92)	(0.14)
Board size	-0.037 ***	-0.028 **	-0.046	-0.034
(log (number of directors))	(3.06)	(2.11)	(1.52)	(1.04)
Return on assets	-0.332 ***	-0.747 ***	-0.361 ***	-0.945 ***
(EBDIT / total assets)	(11.22)	(23.61)	(4.26)	(10.24)
Non-interest tax shields	-4.688 ***	-1.870 ***	-6.161 ***	-2.293
(investment tax credits / total assets)	(8.53)	(3.19)	(4.18)	(1.43)
Asset tangibility	0.083 ***	0.053 **	0.127 **	0.092
(PPE / total assets)	(3.88)	(2.33)	(2.40)	(1.59)
Company size	0.035 ***	0.046 ***	0.031 ***	0.034 ***
(log of total assets)	(10.40)	(12.87)	(3.86)	(3.91)
Industry indicator variables (2-digit SIC)	Yes	Yes	Yes	Yes
Year indicator variables	Yes	Yes	No	No
Observations	3,135	3,133	435	435
R-squared	0.276	0.421	0.391	0.535
F-statistic	18.0	34.3	4.2	7.4
P-value	0.00	0.00	0.00	0.00

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

TABLE III

Variables for analysis of capital structure changes

Definitions and descriptive statistics for variables used in analysis of capital strucutre changes, in addition to those variables listed in Table I. The sample consists of 2,634 observations for 419 companies in the 1984-91 period. Financial statement variables were obtained from Compustat. Corporate governance and stock ownership variables were obtained from proxy statements generally filed by each company during the third or fourth month of its fiscal year. Stock return variables were obtained from CRSP.

Dependent variables	**Definition**	**Mean**	**Std. dev.**
Net debt issued	(debt issued - debt retired) / total assets	0.023	0.124
Equity issued	new equity issued / total assets	0.014	0.040
Equity repurchased	equity repurchased / total assets	0.017	0.042
Change in leverage	(net debt issued - equity issued + net equity repurchased) / total assets	0.026	0.135

Explanatory variables	**Definition**	**Mean**	**Std. dev.**
Unsuccessful tender offer (dummy variable)	= 1 if tender offer made for company during year without control change	0.013	0.115
New CEO (dummy variable)	= 1 if old CEO is replaced during first six months of current year or last six months of prior year	0.095	0.293
New CEO following forced departure (dummy variable)	= 1 if new CEO dummy =1 and prior CEO was age 62 or less and did not remain as a board member	0.013	0.114
Arrival of 5% blockholder (dummy variable)	= 1 if company has 5% stock owner and had none in prior proxy filing	0.060	0.238
New 5% blockholder-director (dummy variable)	=1 if number of 5% stockholders on board of directors increases	0.030	0.170
New CEO and new board blockholder (dummy variable)	=1 if dummy variables =1 for both new CEO and new 5% blockholder-director	0.005	0.071
Market-to-book ratio (start of year)	(equity (market value - book value) + total assets) / total assets	1.279	0.909
Stock return	stock return during fiscal year	0.181	0.354
Tax status (start of year)	net operating loss carry-forward / total assets	0.014	0.070

TABLE IV

Regression coefficient estimates: Determinants of capital structure changes

OLS regression coefficients for models of capital structure changes. The total sample consists of 2,634 observations for 419 companies in the 1984-91 period. Variable definitions appear in Tables I and III. T-statistics appear in parentheses below each coefficient estimate.

Dependent variable: (net debt issued - net equity issued) / total assets

	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Unsuccessful tender offer events	0.174 ***					
	(7.78)					
All CEO replacements		0.008				
		(0.85)				
Forced CEO replacements			0.049 **			
			(2.03)			
Arrival of 5% blockholder				-0.008		
				(0.77)		
Addition of 5% blockholder to board					0.025	
					(1.60)	
Addition of 5% blockholder to board and CEO replacement in same year						0.088 **
						(2.40)
Return on assets during prior year (EBDIT / total assets)	0.068 **	0.072 **	0.107 ***	0.072 *	0.073 **	0.074 **
	(2.05)	(2.17)	(3.13)	(1.93)	(1.96)	(1.99)
Stock return during prior year	0.019 **	0.018 **	0.010	0.013	0.012	0.012
	(2.25)	(2.18)	(1.12)	(1.53)	(1.50)	(1.51)
Leverage (book value) at start of year (total debt / total assets)	-0.087 ***	-0.085 ***	-0.086 ***	-0.078 ***	-0.081 ***	-0.080 ***
	(5.18)	(5.01)	(4.67)	(4.60)	(4.77)	(4.74)
Company size (log of total assets)	0.002	0.002	0.001	0.002	0.002	0.002
	(0.79)	(0.87)	(0.40)	(0.77)	(0.87)	(0.92)
Tax status (net op. loss carry-fwd. / total assets)	-0.122 ***	-0.126 ***	-0.124 ***	-0.152 ***	-0.153 ***	-0.152 ***
	(3.27)	(3.35)	(2.98)	(4.06)	(4.09)	(4.04)
Non-interest tax shields (investment tax credits / total assets)	-0.660	-0.711 *	-0.688	-0.390	-0.360	-0.378
	(1.62)	(1.72)	(1.59)	(0.85)	(0.79)	(0.83)
Asset tangibility (PPE / total assets)	0.025 *	0.029 **	0.034 **	0.014	0.014	0.012
	(1.77)	(2.04)	(2.27)	(1.00)	(1.02)	(1.51)
Year indicator variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,634	2,634	2,416	2,340	2,340	2,340
R-squared	0.060	0.038	0.032	0.038	0.039	0.040
F-statistic	10.3	6.5	5.3	6.1	6.2	6.4
P-value	0.00	0.00	0.00	0.00	0.00	0.00

*** Significant at 1% level
** Significant at 5% level
* Significant at 10% level

TABLE V

Regression coefficient estimates: Entrenchment variables and capital structure changes

OLS regression coefficients for models of capital structure changes. The entire sample consists of 2,634 observations for 419 companies in the 1984-91 period. Variable definitions appear in Tables I and III. T-statistics appear in parentheses below each coefficient estimate.

Each cell in the table represents the outcome for a separate OLS regression. The dependent variable for each regression appears at the top of each column. The explanatory variables for each regression include one of the six measures of CEO entrenchment listed in the left column, as well as the entire set of control variables used in the model in Table IV.

Dependent variable :	Net debt issued	New equity issued	Equity repurchased
Specification:	(debt issued - debt retired) / total assets	new equity issued / total assets	equity repurchased / total assets
Entrenchment variables			
Unsuccessful tender offer events	0.131 *** (6.51)	0.023 *** (3.85)	0.071 *** (11.27)
All CEO replacements	0.001 (0.13)	-0.001 (0.29)	0.008 (1.24)
Forced CEO replacements	0.038 * (1.75)	0.0004 (0.07)	0.007 (1.24)
Arrival of 5% blockholder	-0.008 (0.79)	0.006 * (1.81)	0.006 (1.72)
Addition of 5% blockholder to board	0.026 * (1.81)	-0.001 (0.26)	-0.003 (0.76)
Addition of 5% blockholder to board and CEO replacement in same year	0.090 *** (2.85)	0.027 *** (2.71)	0.004 (0.34)

*** Significant at 1% level
** Significant at 5% level
* Significant at 10% level

TABLE VI

OLS Regression Estimates: Capital structure changes in low-leverage firms

OLS regression coefficients for models of capital structure changes. Observations are included in the analysis of low-leverage firms if their book value of leverage is below a predicted value, based upon fitted values from a regression similar to that described in the first column of Table II. T-statistics appear below each estimate in parentheses.

Dependent variable: (net debt issued - net equity issued) / total assets

	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Unsuccessful tender offer events	0.252 ***					
	(8.04)					
All CEO replacements		0.023 *				
		(1.89)				
Forced CEO replacements			0.110 ***			
			(3.22)			
Arrival of 5% blockholder				0.019		
				(1.23)		
Addition of 5% blockholder to board					0.052 **	
					(2.15)	
Addition of 5% blockholder to board and CEO replacement in same year						0.153 ***
						(2.73)
Return on assets during prior year (EBDIT / total assets)	0.082	0.072	0.127 **	0.062	0.061	0.060
	(1.50)	(1.29)	(2.19)	(1.12)	(1.09)	(1.09)
Stock return during prior year	0.019	0.019	0.002	0.0002	0.001	0.001
	(1.47)	(1.50)	(0.13)	(0.40)	(0.09)	(0.10)
Leverage (book value) at start of year (total debt / total assets)	-0.030	-0.025	-0.034	0.005	0.002	0.005
	(0.68)	(0.55)	(0.71)	(0.11)	(0.04)	(0.11)
Company size (log of total assets)	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.36)	(0.33)	(0.29)	(0.51)	(0.49)	(0.50)
Tax status (net op. loss carry-fwd. / total assets)	-0.064	-0.078	-0.076	-0.124 **	-0.126 **	-0.128 *
	(1.18)	(1.39)	(1.15)	(2.35)	(2.39)	(2.44)
Non-interest tax shields (investment tax credits / total assets)	-0.722	-0.714	-0.664	-0.619	-0.622	-0.649
	(1.28)	(1.24)	(1.12)	(1.10)	(1.11)	(1.16)
Asset tangibility (PPE / total assets)	0.030	0.039 *	0.043 *	0.030	0.030	0.031
	(1.45)	(1.88)	(1.96)	(1.47)	(1.48)	(1.50)
Year indicator variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,455	1,455	1,334	1,302	1,302	1,302
R-squared	0.071	0.032	0.029	0.026	0.029	0.031
F-statistic	6.9	2.9	2.6	2.3	2.5	2.7
P-value	0.00	0.00	0.00	0.00	0.00	0.00

*** Significant at 1% level
** Significant at 5% level
* Significant at 10% level

TABLE VII

OLS Regression Estimates: Capital structure changes in low-leverage firms

OLS regression coefficients for models of capital structure changes. Observations are included in the analysis of low-leverage firms if their book value of leverage is below 0.35. T-statistics appear below each estimate in parentheses.

Dependent variable: (net debt issued - net equity issued) / total assets

	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Unsuccessful tender offer events	0.237 ***					
	(9.34)					
All CEO replacements		0.011				
		(1.12)				
Forced CEO replacements			0.056 **			
			(1.99)			
Arrival of 5% blockholder				-0.003		
				(0.23)		
Addition of 5% blockholder to board					0.049 **	
					(2.36)	
Addition of 5% blockholder to board and CEO replacement in same year						0.161 ***
						(2.90)
Return on assets during prior year (EBDIT / total assets)	0.020	0.028	0.060	0.047	0.048	0.049
	(0.57)	(0.78)	(1.63)	(1.14)	(1.17)	(1.17)
Stock return during prior year	0.022 **	0.023 **	0.013	0.011	0.011	0.012
	(2.27)	(2.28)	(1.23)	(1.13)	(1.15)	(1.16)
Leverage (book value) at start of year (total debt / total assets)	-0.080 **	-0.075 **	-0.077 **	-0.041	-0.042	-0.040
	(2.41)	(2.21)	(2.15)	(1.20)	(1.24)	(1.16)
Company size (log of total assets)	0.003	0.004	0.004	0.003	0.003	0.003
	(1.12)	(1.25)	(0.83)	(0.98)	(1.02)	(1.00)
Tax status (net op. loss carry-fwd. / total assets)	-0.092 **	-0.098 **	-0.104 **	-0.134 ***	-0.137 ***	-0.136 ***
	(2.03)	(2.12)	(1.97)	(2.99)	(3.05)	(3.04)
Non-interest tax shields (investment tax credits / total assets)	-0.899 **	-0.976 **	-0.890 *	-0.770 **	-0.745 **	-0.773 **
	(2.06)	(2.20)	(1.93)	(1.58)	(1.53)	(1.59)
Asset tangibility (PPE / total assets)	0.039 **	0.048 ***	0.054 ***	0.035 **	0.035 **	0.036 **
	(2.36)	(2.87)	(3.05)	(2.05)	(2.06)	(2.13)
Year indicator variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,099	2,099	1,930	1,840	1,840	1,840
R-squared	0.069	0.031	0.025	0.028	0.031	0.032
F-statistic	9.6	4.1	3.3	3.5	3.8	4.0
P-value	0.00	0.00	0.00	0.00	0.00	0.00

*** Significant at 1% level
** Significant at 5% level
* Significant at 10% level