FDIC Center for Financial Research Working Paper

No. 2008-04

How Do Managers Target Their Credit Ratings? A Study of Credit Ratings and Managerial Discretion □□

February 2008

FDIC CFR

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How Do Managers Target Their Credit Ratings?

A Study of Credit Ratings and Managerial Discretion

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February 28, 2008

Abstract

Managers choose credit rating targets by trading off the benefits associated with a high rating against the higher cost of capital associated with the additional equity required to maintain the high rating. We find that small and risky firms tend to target lower ratings, whereas firms with high growth opportunities tend to target higher ratings. In addition, firms with small boards and large blockholders tend to target lower ratings. We also find that deviations from rating targets influence subsequent capital structure choices. When observed ratings are below (above) the target, managers tend to make security issuance and repurchase decisions that reduce (increase) leverage. In addition, firms are more likely to increase dividend payouts when they have above target ratings and are less likely to make acquisitions when they have below target ratings.

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Abstract

Managers choose credit rating targets by trading off the benefits associated with a high rating against the higher cost of capital associated with the additional equity required to maintain the high rating. We find that small and risky firms tend to target lower ratings, whereas firms with high growth opportunities tend to target higher ratings. In addition, firms with small boards and large blockholders tend to target lower ratings. We also find that deviations from rating targets influence subsequent capital structure choices. When observed ratings are below (above) the target, managers tend to make security issuance and repurchase decisions that reduce (increase) leverage. In addition, firms are more likely to increase dividend payouts when they have above target ratings and are less likely to make acquisitions when they have below target ratings.

In early 2006, the management of Time Warner was targeted by Carl Icahn, who had accumulated a large block of shares in the firm. Icahn, threatening a proxy fight, demanded that Time Warner repurchase shares, increase the number of independent directors on the board, and split up the company into four parts. In addition to claiming that the combined firm was destroying value, Icahn explicitly criticized management for "protecting" the company's credit quality as opposed to "managing" to a lower credit rating. Although support for his proxy fight failed to materialize, management agreed to buy back shares and start paying quarterly dividends.[1] In response to this announcement, on February 22, 2006, Fitch downgraded Time Warner's credit rating one notch from a "BBB+" to a "BBB". Two weeks later (March 6, 2006), Moody's lowered Time Warner's ratings to a "Baa2" from a "Baa1."

Of course, most credit rating changes occur as a result of exogenous events that have nothing to do with management choices. Nevertheless, a firm's credit rating is a management choice; either an active choice, as illustrated in the above example, or a passive choice, which is the more typical case when firms fail to make capital structure adjustments that offset both positive and negative shocks to their profitability. This point of view is expressed in a recent research report from Standard & Poor's that states that "… events largely beyond management's control -- such as recession, increased competition, or other business challenges -- often trigger ratings downgrades," but conclude that a recent trend towards lower ratings is largely driven the fact that "companies choose to adopt a less conservative financial position, usually to pursue

[1] "Time Warner bondholders fret that Icahn is just getting started," Bloomberg, February 22, 2006.

acquisitions or increase returns to shareholders."[2] The report cites a number of reasons behind this trend, including shareholder activism and the greater alignment of management compensation with shareholder interests and concludes that "the higher, the better" rating is not consistent with an optimal capital structure policy.

This paper extends previous research that explores the determinants of corporate capital structure choices by examining how firms target their credit ratings.[3] There are two important advantages of examining credit ratings rather than debt ratios as a measure of capital structure. The first is the anecdotal and survey evidence that suggests that managers of large corporations generally describe their capital structure policy in terms of target credit ratings and tend to make financing, hedging, and investment choices that help them achieve their desired rating.[4] The second is that a firm's credit rating provides a more meaningful measure of financial leverage than any individual debt ratio since it aggregates the different aspects of the capital structure decision, such as the maturity and seniority structure of the debt, the amount of debt that is on- versus off-balance sheet, the extent to which the interest rate exposure is hedged, etc.[5] Presumably, the rating agencies can sort through the intricacies of a firm's balance sheet and come up with an assessment of the extent to which its capital structure puts the firm at risk of bankruptcy, which plays a central role in most theories of capital structure. The specifics of how firms engineer their financial structure to achieve their credit rating targets at the lowest possible cost of

[2] "The Leveraging of America: Corporate Financial Policies Evolve toward the More Aggressive," Standard & Poor's Rating Direct, 08 October, 2007.
[3] Among the few studies that examine how credit ratings affect capital structure, Faulkender and Petersen (2006) find that firms with rated debt tend to be more levered, Kisgen (2006) reports that firms with a plus or a minus rating tend to reduce their leverage, and Kisgen (2007) finds that a rating downgrade predicts a subsequent reduction in leverage.
[4] Indeed, Graham and Harvey's (2001) survey evidence reveals that managers focus on their credit ratings when they make their capital structure choices.
[5] In 2004, 85.4% of the largest 500 U.S. firms in the Compustat files we analyze have credit ratings.

capital are of course important, but this is of secondary importance to the actual choice of the credit rating they wish to target.

Like all choices, the credit rating choice is determined by a tradeoff of costs and benefits that are likely to affect different firms differently. Some may find it more beneficial to choose a high rating that allows them to be viewed more favorably by major stakeholders, such as their customers and suppliers, who may be concerned about the long-term viability of the firm.[6] In addition, since credit ratings affect the firm's access to additional financing in the future, firms that are likely to raise capital in the future may prefer to maintain higher ratings to retain their financial flexibility. Also, firms that benefit from the prestige associated with being highly rated may prefer to maintain higher credit ratings.[7]

The costs of achieving a higher credit rating are also likely to vary cross-sectionally. These costs, which arise because a higher rating requires firms to include more equity in their capital structures, are related to the differences in the costs of debt versus equity financing, which are in turn related to the tax benefits of debt as well as the extent to which management believes that the firm's shares are under or overvalued. For example, it may be more costly for small firms to achieve higher ratings, as the required amount of additional equity may be higher for such firms.[8]

[6] See, for example, Titman (1984).

[7] In unreported analysis we collected Fortune's ten most admired firms reported annually between 2001 and 2004 (published on March 7, 2005). We compared the ratings of these firms to their industry peers of similar size and found that the most admired firms generally had higher ratings.

[8] While credit ratings are clearly tied to indebtedness, company size is an important driver of ratings (sometimes more important than measures of leverage). For example, for a small firm, an investment grade rating may simply be out of reach because the leverage ratio required to obtain such a rating may be impractically low. This is not surprising given that size captures firm attributes (e.g., business and financial risk, competitiveness) that are important determinants of ratings.

As our example at the outset illustrates, managerial preferences and corporate governance issues may also influence the credit ratings choice. For example, in addition to the prestige associated with a better rating, managers may prefer their firms to have low default probabilities to protect their jobs and, as a consequence, make choices that lead to higher ratings. Managers may also prefer to alleviate the pressure that comes with interest payment commitments, or may benefit from opportunities associated with managing a more highly rated firm that can more easily raise investment capital.[9] In contrast, if there is a possibility of a hostile takeover, managers may prefer a lower rating if it reduces the potential acquirer's gain and makes a takeover less likely.[10]

We start our empirical analysis by estimating ordered probit regressions that describe how ratings are assigned. Consistent with earlier regressions in Kaplan and Urwitz (1979), Ederington (1985), Bhojraj and Sengupta (2003) and Molina (2005), we find that proxies for leverage and risk negatively affect ratings assigned by the rating agencies. In addition, we find that ratings agencies tend to assign higher ratings to firms with smaller blockholder ownership, larger board size, and fewer outside directors. These findings suggest that from the perspective of a rating agency, holding other measures of leverage and risk constant, a firm is likely to have a higher rating if the firm's management has greater discretion over the firm's future financing and investment choices. One interpretation of this result is that when managers have more discretion over their firms'

[9] Jensen (1986) argues that interest payments reduce resources under managers' control, thereby increasing the monitoring by the capital markets when firms seek to finance new investments. Hart and Moore (1995) and Zwiebel (1996) argue that debt limits managers' ability to finance future investment. Recent survey evidence of Graham and Harvey (2001) indicates that managers regard financial flexibility as the most important factor in their capital structure decisions.

[10] Harris and Raviv (1988) and Stulz (1988) argue that high leverage increases managers' ownership stake, enabling them to have greater control of the firm and helping them to defend against takeover challenges. Israel (1992) argues that high leverage reduces takeover threats because of wealth transfers to the target's existing debt holders.

capital structure choice, they are more likely to make choices, like issue equity, that shore up their firm's balance sheet when they are doing poorly. In contrast, a firm managed in the interests of equity holders will be reluctant to make such choices because of wealth transfers to debt holders.

To examine this possibility more carefully, we estimate ratings choice regressions. These regressions explain observed credit ratings as a function of firm characteristics that proxy for the costs and benefits of achieving a higher rating, along with governance variables that measure the extent to which the manager controls the capital structure choice. Our assumption is that these firm characteristics are exogenous, and that they influence endogenous capital structure choices, such as the debt ratio, the maturity structure, etc., which in turn determine the firm's credit rating. These regressions are similar to our ratings assignment regressions except that they exclude the debt ratio.

The estimates of these regressions are consistent with the hypothesis that ratings choices reflect the costs and benefits of achieving a higher rating. For example, we find that firms with high market-to-book ratios tend to choose high ratings, which is consistent with the idea that higher ratings are more beneficial for firms that need to preserve their flexibility to finance future investments. We also find that small firms tend to choose low ratings, which is consistent with the idea that the costs of achieving a high rating are very high for these firms. In addition, our findings suggest that managers of more weakly governed firms, who enjoy more discretion, tend to choose higher ratings. In particular, firms with large boards of directors and small ownership levels by large blockholders tend to choose higher ratings.

As we mentioned at the outset, although firms choose what rating to target, exogenous shocks to their profitability, risk, and other factors may result in deviations from their target ratings. Because of debt overhang issues and transaction costs, firms may be rather slow about making capital structure choices that offset these deviations. Nevertheless, if managers take these target ratings seriously, the deviation between their current ratings and their targets are likely to influence future investment and financing choices.

To explore this possibility we examine how deviations from estimated target ratings affect a variety of corporate choices.[11] Consistent with the target ratings hypothesis, we find that below-target firms tend to make financing, payout, and acquisition choices that decrease their leverage whereas above-target firms tend to make choices that increase their leverage. For example, below-target firms tend to issue equity rather than debt, tend to retire debt rather than repurchase equity, and tend to temper their growth through acquisitions. In contrast, above-target firms tend to repurchase equity rather than retire debt and tend to increase rather than decrease their dividends. As a result, changes in ratings observed over time tend to offset the initial deviation from the rating target. These effects are significant even after controlling for the deviation from the target debt ratio and other determinants of corporate financing choices identified in the earlier literature. In addition, as we show, after we control for target ratings, the plus and minus ratings found to be important in Kisgen (2006) do not significantly influence these choices.

Differences in firm choices when they are below versus above the target ratings also provide insights on the relative importance of debt overhang and corporate governance. If

[11] In this sense our analysis is similar to Hovakimian, Opler and Titman (2001), Leary and Roberts (2005) and Flannery and Rangan (2006), which examine deviations from target debt ratios.

managers have preferences for high ratings we might not expect firms with above target ratings to take actions that decrease their ratings, but we would expect to see firms with below target ratings to take actions that increase their ratings. In contrast, if debt overhang is important, we might expect to observe the opposite. Our results indicate that firms react stronger to offset the deviation from the target rating when their rating is below the target than when the rating is above the target, which suggests that on average, the effect of managerial preferences are stronger.

The rest of the paper is organized as follows. Section I describes the rating process. Section II reports our data. Section III presents the results for our rating assignment model. Section IV presents our rating choice model and the corresponding results. Section V presents the effects of target ratings on changes in ratings. Section VI presents the effects of target ratings on corporate financing decisions. Section VII presents the effects of target ratings on dividend and acquisition decisions. Section VIII summarizes our conclusions.

I. Rating Process

Rating agencies claim that they provide accurate "relative" ratings of credit risk at each point in time without reference to an explicit time horizon. In their Corporate Ratings Criteria (2006) manual Standard & Poor's states that their *"credit ratings are meant to be forward-looking, and their time horizon extends as far as is analytically foreseeable. Accordingly, the anticipated ups and downs of business cycles – whether industry-specific or related to the general economy – should be factored into the credit rating all along. Ratings should never be a mere snapshot of the present situation. Accordingly, ratings are held constant throughout the cycle, or, alternatively, the rating*

does vary – but within a relatively narrow band (page 33)*."* What this means is that although credit ratings provide an ordinal ranking of default risk across firms, depending on the business cycle, the mapping between ratings and default probabilities may change.

It should also be noted that, in addition to using information from a firm's accounting statements, the ratings agencies consider financial projections that are not available to the financial economists who study ratings assignments. Standard and Poor's states that "*[M]anagement's financial projections are a valuable tool in the rating process, because they indicate management's plans, how management assesses the company's challenges, and how it intends to deal with problems. Projections also depict the company's financial strategy in terms of anticipated reliance on internal cash flow or outside funds, and they help articulate management's financial objectives and policies* (Corporate Ratings Criteria, page 16)." As part of their task of assessing these financial projections, the ratings agencies must assess the credibility and the quality of management, so that corporate governance issues are likely to influence the ratings that are assigned.

If rating agencies fully incorporated the expected future corporate financing behavior, so that ratings would reflect the true long-run probability of default, future changes in ratings would not be predictable using public information. However, as we later show, credit rating changes are predictable. There are two reasons why this is the case. First, although the ratings agencies use management projections in the ratings process, they are unlikely to put much weight on a firm's intention to raise equity in the future, and will not adjust their ratings until the equity is actually issued. For similar reasons, the rating agencies may not fully account for firm characteristics that may be indicators of the incentives of firm's to take risks in the future (i.e., governance). In other words, credit

ratings primarily reflect long-term probabilities of default given the firm's current financial structure. Given this, if we have theories that predict when firms will make choices that shore up their balance sheets or reduce risks, we can predict ratings changes. This, of course, does not imply that we can predict bond returns, which should reflect changes in actual default probabilities rather than changes in ratings.

Rating agencies also tend to be slow about updating their ratings, which adds to the predictability of ratings changes. Ratings are updated only when agencies are confident that observed changes in a company's risk profile are likely to be permanent (they call this prudent rating migration policy).[12] Rating agencies aim at maintaining stability by rating through-the-cycle, which lowers the sensitivity of ratings to short-term fluctuations in credit quality, and respond to investors' desire to keep their portfolio rebalancing as low as possible. The ratings agencies may smooth their ratings changes because their clients (institutions holding bonds) do not want to see ratings change with each small change in the firm's prospects. In their published report over their meetings with the issuer organizations, investors, asset management firms, regulators and other market participants, Moody's note that "*Market participants desire ratings stability. They want ratings to be a view of an issuer's fundamental credit risk, which they perceive to be a relatively stable measure of intrinsic financial capacity compared with other, more market-sensitive measures* (Fons et al., (2002))."

[12] Altman and Rijken (2004) quantify the impact of the long-term default horizon and the prudent migration policy on rating stability. They show that, in contrast to one-year default prediction models, agency ratings place less weight on short-term indicators of credit quality, which is consistent with the idea that rating agencies are focused on the long term. They also show that, prudent migration policy is an even more important factor underlying the stability of agency ratings. Their evidence indicates that rating migrations are triggered when the difference between the actual agency rating and the model predicted rating exceeds a certain threshold level and that the trigger leads to only partial adjustment.

II. Data

Our measure of credit rating is the S&P long-term issuer level rating extracted from Compustat.[13] The letter ratings are transformed into numerical equivalents using an ordinal scale ranging from 1 for the lowest rated firms (CCC-) to 19 for the highest rated firms (AAA).[14] The proxies for the firms' financial characteristics important for our analysis are extracted from the Compustat Industrial Annual Files. The stock return data are from CRSP. The governance data are collected from Compact Disclosure.[15]

As in other studies of capital structure, we exclude financial firms (SIC codes 6000-6999) from the sample. In addition, we restrict the sample to include firms with book value of assets and sales above $1 million. To limit the influence of outliers, all ratio variables are trimmed at the top one percent and, for variables that take on negative values, bottom one percent of their values.[16] The resulting sample consists of 89,070 firm-year observations between 1985 and 2005, including 16,816 observations with credit ratings.[17] Table I presents the distribution of our sample firms by rating and year. Table II presents the distribution of firm characteristics important for our subsequent analysis for the subsamples of firms with and without credit ratings.

III. Determinants of Observed Ratings

Although firms target their credit ratings, they do so only indirectly. Rating agencies assign credit ratings based on their assessment of the risk of default. Firms, in turn, make

[13] The Compustat data item for credit rating is 280, which defined as the Standard & Poor's current opinion of an issuer's overall creditworthiness, apart from its ability to repay individual obligations, and it focuses on the obligor's capacity and willingness to meet its long-term financial commitments.
[14] Observations with credit ratings indicating default (Compustat data 280 equal 27 or 29) are excluded from our analysis except when examining changes in ratings as described in section IV.
[15] The governance data covers only part of our overall sample from 1988 to 1999.
[16] The exception is the book debt ratio, which is trimmed to exclude observations with book debt ratios of one or higher.
[17] Compustat coverage of credit ratings starts in 1985.

financing and investment choices that influence this assessment. To better understand the constraints imposed on a firm's ratings target by this rating process, we start our analysis with a simple stylized model that examines the factors that affect the credit ratings assigned by the rating agencies.

A. Rating Assignment Model

Our rating assignment model is similar to the regressions estimated in prior studies that model how rating agencies assign credit ratings as a function of the leverage ratio and other financial and corporate governance characteristics.[18] Our representation of the rating assignment model is summarized as follows:

$$Rating_{it} = \alpha_j + X_{it}\beta + \gamma Leverage_{it} + \delta Governance_{it} + \varepsilon_{it}. \quad (1)$$

The governance characteristics are included to capture the possibility that ratings agencies consider how governance influences future choices. Because ratings are forward looking, the ratings agencies have an interest in determining the incentives and abilities of a firm's management to make future choices that can influence default risk. We assume that managers have less discretion, and tend to act more in the interest of shareholders if more shares are held by large blockholders and if they have fewer directors and more of the directors are independent.[19]

[18] Some of the papers on predicting credit ratings are Pogue and Soldofsky (1969), Pinches and Mingo (1973), and Kaplan and Urwitz (1979).

[19] Large investors are defined as holders of five percent or more of shares outstanding. Board size is the number of the directors on the board. Board independence is the percentage of outsiders on the board. Shleifer and Vishny (1986) argue that shareholders with large equity positions have greater incentives to monitor management than do small, atomistic shareholders and Weisbach (1988) and Yermack (1996) suggest that the composition and the size of the board are important determinants of the managerial disciplining mechanisms.

The remaining set of independent variables includes the leverage ratio and other financial characteristics that proxy for the probability of bankruptcy.[20] Following earlier studies of credit ratings and capital structure, we include variables such as firm size, asset tangibility, market-to-book, research and development (R&D) expenses, selling expenses, and profitability.[21] Because there are a large number of observations with missing R&D, we set the R&D values of these firms to zero. To control for the possibility that firms that do not report R&D may be different from those that do, we include an indicator variable set to one for firms with non-missing R&D.

Due to the categorical and ordered nature of credit ratings, equation (1) is estimated using an ordered probit specification, which takes into account the fact that the "distances" between the adjacent ratings are not necessarily equal. Industry indicators are included to control for fixed industry factors, α_j.[22]

B. Selection Problem

It is important to note that not all firms have ratings. To have a credit rating, a firm has to have long-term bonds outstanding.[23] Firms that self-select to issue rated debt are

[20] Leverage is [short-term debt (Compustat data 34) + long-term debt (data 9)]/assets (data 6).

[21] These variables have been previously considered by Titman and Wessels (1988), Rajan and Zingales (1995), and others. Size is the natural log of sales (data 12), adjusted for inflation. Tangibility is the property, plant, and equipment (data 8) scaled by total assets. R&D is the research and development expense (data 46) scaled by sales. Selling expense is selling, general, and administrative expense (data 189) net of R&D (data 46), scaled by sales. Profitability is operating income (data 13) scaled by lagged assets. Market-to-book is (total assets – book equity + market equity)/total assets. Book equity is the book value of stockholders' equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Depending on availability, we use the redemption (data 56), liquidation (data 10), or par value (data 130) to estimate the book value of preferred stock. Stockholders' equity is (data 216), if it is available. If not, we measure stockholders' equity as the book value of common equity (data 60) plus the par value of preferred stock, or the book value of assets minus total liabilities (data 181).

[22] The industry indicators are based on 49 industry classifications downloaded from Professor Kenneth R. French's web site.

[23] In their hand-collected sample of 5,529 observations, Cantillo and Wright (2000) find only 18 observations where a firm had a bond rating but no public debt and only 135 observations where a firm had public debt but no bond rating.

likely to be inherently different than firms that do not, which can bias the coefficient estimates in regression (1). We address the self-selection problem by explicitly modeling the probability of having a credit rating with a set of instruments that are unrelated to the level of rating.[24] The selection equation has the following form:

$$Rated_{it} = \alpha + \beta Instruments_{it} + X_{it}\gamma + \xi_{it}\,. \qquad (2)$$

In equation (2), "Rated" takes the value of one if a firm has a rating and zero otherwise. We estimate both the selection equation (2) and the rating prediction equation (1) simultaneously using maximum likelihood. In addition to the parameters indicated in equations (1) and (2), the model estimates the correlation, ρ, between the error terms ε and ξ.

We use five instruments for modeling the selection decision. Similar to Faulkender and Petersen (2006), we use proxies to measure the firms' visibility; the idea is that firms that are well known, familiar, and widely followed are likely to face lower costs of introducing public debt issues to the market and hence are more likely to get rated. Our visibility proxies include an indicator variable for firms traded on NYSE and two indicator variables for the presence of the firm in the large-cap and the mid-cap S&P indexes. Firms that belong to these indexes are likely to be more visible than otherwise similar firms. A firm's age may also influence its visibility, as older firms are likely to be better known by the market participants. We include an indicator variable for whether the firm is three years old or younger to capture the effect of age.

Another way to gauge the accessibility of the public debt markets is to see whether other firms in the same industry have rated debt. If there are comparable firms with

[24] Maddalla (1983) provides an in-depth discussion of models with self-selectivity.

outstanding public debt, it may be easier for a firm to participate in the bond market. We, therefore, include a variable measuring the percentage of firms in the same industry that have rated debt as the fifth instrument in our selection model.[25]

The selection model also includes firm characteristics that proxy for a firm's propensity to participate in public debt markets. Some firms may have access to the (public) debt market but may choose not to issue long-term bonds. We may, therefore, only observe firms that find long-term debt more valuable due to greater tax shields or contracting benefits and/or lower financial distress costs. For example, large firms and firms with tangible assets are expected to have lower financial distress costs and hence are more likely to have long-term debt. In contrast, firms with high growth opportunities and significant intangible assets may prefer to avoid the debt markets as they face higher costs of financial distress. Our proxies for these factors are R&D intensity, selling expenses, and the market-to-book ratio. The effect of profitability on a firm's propensity to use long-term debt is theoretically ambiguous. While debt may be used less by more profitable firms as a result of their lower external financing needs, such firms may benefit from significant debt tax shields, which should make debt financing more attractive.

C. Results

Table III presents the estimation results for regression equations (1) and (2). Because the managerial discretion data are available for only part of our sample, we report two sets of results. The first half of the table reports the results of estimation on our full sample, but without managerial discretion variables on the right hand side. The second half of the table reports the results for the subsample for which the managerial discretion

[25] Following Faulkender and Petersen (2006), this variable is calculated as ln(1+fraction rated), where fraction rated is the fraction of rated firms in the industry, defined based on the 49-industry classification.

variables are available. The reported robust t-statistics reflect standard errors adjusted for heteroskedasticity and correlation within firm-level clusters.[26]

The results in the first column of Table III are for the selection equation (2). The results show that firms that have rated debt are indeed different from the ones that do not have a rating. Furthermore, the statistically significant estimate of the correlation between error terms in the selection and the rating prediction equations reveals the presence of unobservable factors that affect both the decision to have a rating and the rating assigned by the rating agency. The positive correlation indicates that firms are more likely to choose to be rated if they are likely to receive a higher credit rating. Ignoring this correlation would bias the estimates of the coefficients in equation (1).

Consistent with our conjecture that the probability of being rated increases with visibility, NYSE traded firms and firms from the S&P500 large-cap and S&P400 mid-cap indexes are more likely to be rated, whereas younger firms are less likely to be rated. The probability of being rated increases with the fraction of rated firms in the industry. Larger firms, firms with more tangible assets, and firms with lower growth opportunities (market-to-book) are also more likely to be rated as they are more likely to have issued long-term debt given their lower information asymmetry and lower costs of financial distress. Not surprisingly, the likelihood of having rated debt increases with the firm's debt ratio. These results mirror the unconditional differences in characteristics of rated and unrated firms in Table II. In contrast, although unconditionally the probability of being rated increases with profitability and declines with R&D (Table II), the signs of these coefficients flip in Table III when we control for other firm characteristics.

[26] Petersen (2008) provides simulation analyses that show that controlling for clustering produces correct standard errors when there is within-cluster correlation in the residuals.

The second column in Table III presents the results for the rating assignment model (1). Consistent with the prior literature that examines the determinants of observed corporate bond ratings, we find that firms with lower leverage as well as larger and more profitable firms tend to be assigned higher ratings. We also find that firms with higher market-to-book ratios, tangibility, and selling expenses and lower R&D tend to be assigned higher ratings.

The results in the third column are for the selection equation (2) with managerial discretion variables on the right hand side. These results are similar to those reported in the first column, except the coefficient on market-to-book is insignificant. In addition, the results show that firms with more outsiders on the board are more likely to have rated debt.

The results in the fourth column suggest that governance variables do influence the assigned ratings.[27] Specifically, the regressions indicate that firms with boards and ownership structures that make it easier for managers to choose capital structures that benefit them personally tend to be assigned higher credit ratings. More specifically, we find that larger boards are associated with significantly higher ratings while a higher percentage of outsiders on the board and a larger share of blockholdings are associated with significantly lower ratings. These results are consistent with the conjecture that the rating agencies believe that managers bear a personal cost in the event of bankruptcy, and thus a higher degree of managerial discretion reduces bankruptcy risk.[28]

[27] Because the number of observations with CCC and CCC- ratings in this version of the model is very low, ratings CCC-, CCC, and CCC+ are combined into a single broad rating level in these regressions.

[28] Bhojraj and Sengupta (2003) and Ashbaugh-Skaife, Collins, and LaFond (2006) also examine the effect of governance characteristics on "assigned" ratings and present results largely consistent with ours. Bhojraj and Sengupta (2003) find that firms with greater institutional ownership and stronger outside control of the board enjoy higher ratings assignments from rating agencies on their new bond issues but the effect of

D. Endogeneity Issues

While the results in the previous section are suggestive, they should be interpreted with some caution. If, as we argue, firms target credit ratings based on their costs and benefits, and adjust their debt ratios to achieve these targets, then the debt ratio is endogenous. If there are unobservable risk factors that affect both the rating assignment by the agency and the debt ratio chosen by the firm, then the coefficient estimate on the debt ratio is likely to be biased. Specifically, since firms are likely to choose less debt when there are unobservable risk factors that increase the probability of default, the coefficient on debt will be biased towards zero.[29]

The more important contribution of this regression, relative to the existing literature, is the inclusion of the governance variables, and the coefficients of these variables may also be biased because of the endogeneity of the debt choice. However, the relation between unobserved risk and governance is likely to induce a bias against our finding that credit ratings improve with managerial discretion. Specifically, managers operating in a higher risk environment are likely to have more autonomy in their decisions, since decisions in these environments have to be made at a faster pace and/or require more specialized and in-depth understanding of the firm's operations and financing opportunities. Thus, high risk is likely to be associated with both more managerial discretion and lower ratings, inducing a negative bias in the relation between discretion and credit ratings. Although we cannot exclude the possibility of a 'spillover" bias due to

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institutional ownership on rating reverses if the measure is based on the concentration of institutional ownership. Ashbaugh-Skaife, Collins, and LaFond (2006) document that firm credit ratings are negatively associated with the number of blockholders and positively related to over-all board independence. Note that, in contrast to these papers that argue that "bad" governance leads to lower ratings, we interpret our results as suggesting that managerial discretion lowers the default risk.

[29] Molina (2005) shows that, on average, the effect of the debt ratio on ratings is up to three times stronger once he instruments for debt.

the bias in the debt ratio effects we discussed earlier, it does not seem likely that the significance of the governance variables can be generated spuriously by these second-order effects.[30]

IV. Determinants of Target Ratings

This section examines how the characteristics of a firm's business as well as the degree of discretion of its managers determine its rating choice.

A. Rating Choice Model

Because firms' target ratings are not observable, we follow the approach of the earlier studies of capital structure that estimate the target debt ratio as the fitted value from a regression of observed debt ratios. Specifically, we regress the ratings on the set of variables we used in Section III to examine the determinants of observed ratings, with a few modifications.

The main difference between this analysis and the analysis presented in Section III is the exclusion of the leverage ratio from the rating choice model. Our interpretation is that leverage is an endogenous choice variable that allows the firm to achieve the target rating that it desires. For example, a firm that desires a higher rating can issue equity and use the proceeds to pay down debt while a firm that is willing to reduce its rating can borrow to repurchase equity. The following equation summarizes the target rating regression model:

$$Rating_{it} = \alpha_j + X_{it}\beta + \delta Governance_{it} + \varepsilon_{it}. \quad (3)$$

[30] While these endogeneity concerns could be addressed with an instrumental variable approach, this exercise is beyond the scope of our paper. First, good instruments are difficult to come by and in this case instruments will be needed for several variables.

Similar to regression model (1), we estimate the regression parameters using an ordered probit specification with sample selection correction. Standard errors are adjusted for heteroskedasticity and correlation within firm clusters.

Note that, although firms choose what rating to target, exogenous shocks to their profitability, risk, and other factors may result in deviations from their target ratings. Because of debt overhang issues and transaction costs, firms may be rather slow about making capital structure choices that offset these deviations. As a result, the observed ratings reflect not only the firm's target, but also the deviation from the target.

Our estimation of the target is based on the assumption that the variation in observed ratings explained by firm characteristics reflects differences in rating targets, whereas the deviations from the targets are captured by the regression residual. The main caveat of this approach is that some variables in the rating choice model (equation (3)) may be correlated with deviations from the target. To address this caveat, in unreported regressions we exclude variables from the target regression that can plausibly proxy for deviations from the target rather than the actual target. In addition, as we discuss further in Section V, we can test the overall quality of our proxy for the target rating by examining the extent to which our target proxy predicts future changes in ratings as well as corporate decisions that affect the ratings. The fact that we have an imperfect proxy for the target will reduce the extent to which these target proxies predict future choices and will work against finding evidence for the relevance of rating targets in corporate decisions.

B. Results

Table IV presents the maximum likelihood estimates of the coefficients for regression equations (2) and (3). Once again, we report two sets of results. The first two columns are for the model without managerial discretion variables and the third and the fourth columns are for the model with managerial discretion variables. The coefficient estimates for the selection equation in the first and the third columns in Table IV are similar to those reported, respectively, in the first and the third columns of Table III, except the effects of market-to-book and profitability are insignificant, whereas the effect of the selling expense is significant.

In contrast to Table III, the correlation between the error terms of the selection equation (2) and the target rating equation (3) is negative, implying that firms with lower target ratings are more likely to choose to have rated debt. A possible explanation is that, for firms that optimally choose to use little debt, the costs of accessing the public debt market may outweigh the benefits.[31] Had these firms chosen to access the public bond market they would likely be targeting a high rating.

The results in columns two and four in Table IV indicate that firms with high market-to-book ratios tend to choose higher credit ratings, which is consistent with the hypothesis that firms with significant growth opportunities target high ratings to protect the value of these opportunities from the negative effects of financial distress. Consistent with the hypothesis that high product specificity is associated with high financial distress costs (as discussed in Titman (1984) and Titman and Wessels (1988)), firms with high selling expenses target high credit ratings. Firms with high asset tangibility also tend to choose higher ratings. One possibility is that firms with a high fraction of tangible assets

[31] Blackwell and Kidwell (1988) argue, for example, that public bond issuers face high fixed issuance costs.

are less likely to engage in risk-shifting (asset substitution) activities, allowing them to achieve a higher rating for a given amount of debt (see Table III) and implying that the costs of obtaining a high rating are lower for such firms. Small firms tend to choose lower ratings, which is consistent with the observation that these firms require lower debt ratios to achieve a given rating, and thus their costs of having a high rating are higher.

Our results also indicate that high profitability is associated with high credit ratings. There are several potential explanations for this effect. First, holding the debt ratio constant, the probability of default should decline with profitability (the results for the rating assignment model reported in Table III confirm this negative association). However, tradeoff arguments suggest that an increase in profitability should trigger an increase in leverage since the firm can now achieve the same probability of default with more debt and enjoy the benefits of higher tax shields. Our results in Table IV suggest, however, that the increase in leverage does not fully offset the direct positive effect of higher profitability on rating. One possibility is that more profitable firms target a lower probability of default to protect the sources of higher profitability, such as a favorable competitive position, which could be lost in the event of financial distress.

Alternatively, asymmetric information (Myers and Majluf (1984)) and personal taxation (Auerbach (1979)) considerations may induce firms to retain their profits, which would reduce their debt ratios. Moreover, adjustment costs may prevent firms that experience lower debt ratios as a result of higher profits from immediate rebalancing (Hennessey and Whited (2005), Strebulaev (2007)). If the positive effect of profitability on ratings arises because it reduces leverage, then the effect of profitability on ratings

should be more positive when we do not control for leverage (Table IV) relative to the effect when we do control for leverage (Table III).

Consistent with this prediction, for specifications without managerial discretion variables, the positive effect of profitability is stronger in Table IV (2.415) than in Table III (2.326), however, the difference is not particularly large. However, for specifications with managerial discretion variables, the effect of profitability is unaffected (2.548) by the inclusion (Table III) or exclusion (Table IV) of leverage. These mixed results do not allow an unambiguous conclusion about whether profitability should be viewed as a determinant of target ratings or as an indicator that a firm's rating deviates from its target.

The effect of R&D on the rating choice is insignificant. In Table III, we observed that, controlling for leverage, the effect of R&D on credit rating was negative, consistent with the idea that high R&D firms are riskier. The insignificant effect observed in Table IV, where we do not control for leverage, implies that firms tend to fully offset the negative direct effect of R&D on ratings by choosing lower debt ratios. However, the results do not support the idea that high R&D firms, because of their higher costs of financial distress, choose capital structures with lower default probabilities.

Our results also indicate that managers with more discretion tend to choose higher credit ratings. Specifically, firms with large boards tend to have higher ratings and firms with large outside blockholdings tend to have lower ratings. These findings are consistent with the hypothesis that managers have a personal preference for higher ratings and when they have the discretion, they make capital structure, investment, and/or risk choices that allow them to achieve this objective.

V. Adjustments toward Target Ratings

As we argued earlier, asymmetric information problems, debt overhang, transaction costs, and agency problems make it possible that, at any point in time, a firm's credit rating may deviate from its target. This section examines whether the estimated deviations from the target ratings predict future changes in ratings. The idea is that if firms have target ratings, then we would expect their credit ratings to change over time to reflect the firms' tendency to move towards their targets. More specifically, if a firm's current credit rating is below its target (i.e., the firm is experiencing a rating deficit), we would expect the firm to react by reducing its debt ratio, which should in turn produce an improvement in its rating over time. Similarly, if the firm's observed credit rating is above its target (i.e., the firm has a rating surplus), than the firm is expected to make financing and other choices that tend to cause the rating to decline over time.

Before proceeding, it should be noted that the tests in this section are tests of the joint hypothesis that (1) firms have target ratings to which they adjust and (2) our regression-based proxy for the target is a reasonably good measure of the true target rating. Thus, to the extent that the results in this section are consistent with the hypothesis that firms adjust to their target ratings, they also validate our approach for estimating the proxy for the target.

C. Determinants of Changes in Ratings

To test whether the changes in ratings observed over time are influenced by the deviations from target ratings, we estimate the following predictive regression:

$$\Delta R_{it,t+1} = \beta_{0t} + \beta_1 Rating\ Deficit_{it} + \beta_2 Rating\ Surplus_{it} + X_{it}\gamma + \varepsilon_{it}. \qquad (4)$$

The dependent variable in (4) is the change in the observed rating over the next year. This regression allows us to test whether the observed ratings revert to the target over time. Because of the ordinal nature of changes in ratings, equation (4) is estimated as an order probit regression. All specifications of regression (4) include fixed year effects, β_{0t}, to control for macroeconomic factors.

Our main variable of interest is the deviation of the observed rating from the target rating. To see whether firms react differently when they are above and when they are below the target, we split the deviation from target rating into two components. *Rating Deficit* is defined as (*Target – Rating*) with negative values set to zero. Similarly, *Rating Surplus* is defined as (*Rating – Target*) with negative values set to zero. The target in these calculations is constructed as the predicted rating from the rating choice regression model (3).[32]

Earlier in the paper, we discussed a caveat that some variables in the rating choice model may be correlated with deviations from the target. We address this caveat in this section in two ways. First, we test for the robustness of our results by excluding from the target model profitability and market-to-book, two variables that may enter the target regression because they proxy for deviations from the target rather than being a determinate of the target. The results reported in this and subsequent sections remain qualitatively the same whether or not these variables are included in the target regression. Second, although the results reported in the remaining tables are generated with profitability included in the target rating model, we control for the independent impact of

[32] We use the version of the rating choice model (3) that excludes the measures of managerial discretion from the regression. This increases the number of usable observations in the rating change regressions. We examine the effect of managerial discretion on changes in rating by including managerial discretion variables directly in one of the specifications of the rating change regression (4).

past profitability, as measured by return on assets and net operating loss carryforwards. We also include the market-to-book ratio and past stock returns as controls for market timing of security issues, as well as size as a control for accessibility of public security markets.

Regression (4) includes a number of other control variables. First, we note that firms with the highest ratings cannot experience further increases whereas firms with the lowest ratings cannot experience further declines. To control for these effects, the rating change regression includes the beginning of period rating (R_t) among the independent variables.

Kisgen (2006) reports that firms with plus and minus ratings are more likely to issue equity and less likely to issue debt. To control for this effect, we include two indicator variables. *Minus Rating* takes the value of one if the firm's credit rating has a minus (e.g., AA-, A-, etc.) and *Plus Rating* takes the value of one if the firm has a "plus" rating (e.g., AA+, A+, etc.).

Following Hovakimian, Opler, and Titman (2001) we estimate a target debt ratio model (see Appendix) and include *Leverage Deficit* and *Leverage Surplus* as additional control variable in regression (4). *Leverage Deficit* is defined as the difference between the estimated target debt ratio and the observed debt ratio, with negative values set to zero. *Leverage Surplus* is defined as the difference between the observed debt ratio and the estimated target debt ratio, with negative values set to zero.

The last specification of regression (4) includes three variables measuring the extent of managerial discretion. As before, our expectation is that managers with more discretion would tend to choose higher ratings.

D. Survivorship bias

The coefficient estimates generated by regression (4) may be affected by survivorship bias. Specifically, the results may be biased in favor of mean-reversion since AAA-rated firms can only be downgraded whereas CCC-rated firms that do not exit the sample due to bankruptcy can only be upgraded. We should note that our procedure for calculating changes in ratings mitigates this possibility. Specifically, we do not exclude changes into ratings that indicate default. For the purposes of calculating changes in ratings these default ratings are assigned a code of zero. Thus, changes in ratings used in our estimation of regression equation (4) take into account cases in which the rating declines to the level of default.

Nevertheless, although the number of observations with valid initial ratings is 16,816 as in Table IV, the largest number of observations with valid changes in ratings that can be used to estimate regression (4) is only 14,414. Of the difference of 2,402 observations, however, 922 are observations in the last year of our sample, 2005, for which changes simply cannot be calculated. The distribution of the remaining 15,894 observations with initial ratings and 14,414 observations with changes in ratings across the nineteen rating levels, which is presented in Panel A of Table V, indicates that concerns about survivorship bias are not unfounded. Specifically, for all the rating levels except the bottom three the average changes in ratings are negative.[33] For the lowest three levels (CCC-, CCC, CCC+), however, the average rating changes are positive. They are also the

[33] The negative change in ratings is consistent with theory. To understand why this is the case, assume risk-neutrality and note that bonds with lower than AAA ratings have yields that exceed the risk free rate. This means that at least on average, the lower rated bonds realize capital losses (otherwise they dominate risk-free bonds).

largest in magnitude among all the rating levels. Furthermore, the one-year survival rates for firms in these categories are quite low, varying between 63.4 and 74.2 percent.

To alleviate the effects of the survivorship bias on the coefficient estimates, we estimate rating change regression (4) on two modified samples.[34] First, we note that the patterns in Panel A of Table V suggest that excluding observations with the lowest ratings may help mitigate the impact of the survivorship bias. For this reason the first three regressions reported in Panel B of Table V are estimated on the subsample that excludes observations with initial ratings of CCC+ or lower.

As reported in Panel A of Table V, we are unable to calculate the one-year change in rating for 1,480 observations with valid initial ratings. Of these, for 556 observations, we have data on other variables that allow us to construct estimated ratings. We use these variables and the first set of results from the ratings assignment model (1) from Table III to construct the expected change in rating from year (t) to year (t+1), which is the difference between the expected rating produced by our regression model (1) for year (t+1) and the expected rating produced for year (t). We then replace the missing values of changes in ratings for these 556 observations with the expected changes in ratings estimated based on changes in firm characteristics reported in Table III. We then estimate regression equation (4) on this enlarged sample and report the results in the second half of Panel B, Table V.

Of the 924 observations for which we couldn't replace the missing change in rating with the expected change in rating, for 508 firms we were able to identify the reason for their disappearance from Compustat based on footnote 34, which reports the year the firm

[34] The results on the original sample of 14,414 changes in ratings are similar, but are not reported for brevity.

is dropped from Compustat and footnote 35, which provides a code indicating the reason. In 484 cases, firms disappeared due to a merger or an acquisition, one due to a reverse acquisition, seven underwent an LBO, four became privately owned, and twelve disappeared due to other unspecified reasons. The fact that this set of observations is dominated by firms that were acquired rather than firms that went bankrupt further mitigates our concern about survivorship bias.

E. Results

Overall, the results reported in Panel B of Table V are consistent with the hypothesis that firms have ratings targets and that they tend to make choices that offset the deviations from these targets. In all six specifications, firms with below-target ratings (rating deficit) are significantly more likely to improve their ratings whereas firms with above-target rating (rating surplus) are significantly more likely to reduce their ratings. This evidence of adjustment to a target rating is not generated by mean reversion in the ratings, since we include the initial rating to control for this effect.

The effects of plus and minus ratings on changes in ratings are insignificant in all specifications. The effect of leverage surplus is also insignificant in the regression that controls for measures of operating and market performance. In contrast, firms with leverage deficits experience improvements in ratings over the next year.

The introduction of controls for operating and stock return performance does not affect these results, but reveals that high operating performance and high stock returns predict improvements in credit ratings over the next year. These results are consistent with the earlier literature that finds that observed debt ratios are negatively related to profitability and stock returns (e.g., Welch (2004)). However, the fact that these variables

predict future ratings changes indicates that the ratings agencies react to this information with a lag and that firms do not tend to take actions, like issuing equity following bad performance that offset the effect of past performance.

The persistence of the performance effects may reflect the difficulty that poorly performing firms face in reducing their debt. Taking actions like issuing equity is especially costly following poor performance since issuing equity benefits existing debt holders at the expense of equity holders. In addition, issuing equity requires board approval, which may not be easy for an underperforming CEO, as issuing equity when the stock price is low may be viewed as a tacit acknowledgement that the CEO does not expect performance to improve anytime soon.

The comparison of the effects of the rating deficit and rating surplus indicates that firms move less toward their target rating when their current rating is above the target than when their current rating is below the target. This observation is consistent with the hypothesis that managers of firms with above target ratings enjoy private benefits from the high ratings. To further examine this hypothesis we include proxies for managerial discretion in the rating change regressions. The results of these regressions, which are presented in columns three and six of Panel B in Table V, indicate that firms with higher blockholder ownership, and hence less managerial discretion, tend to see their ratings decline over time.

To summarize, deviations from target ratings predict the changes in ratings observed over the next year. Firms with observed ratings below their target experience improvements in their ratings, whereas firms with ratings above their target experience

declines in their ratings. These results are consistent with the hypothesis that firms tend to make choices that offset the deviations from their target rating levels.

F. Robustness of the results

In this subsection, we examine how sensitive our results are to variations in the empirical design. Specifically, in the reported tests, we measure leverage as the sum of short-term and long-term debt scaled by the book value of total assets. Although this book leverage measure is used in many studies of capital structure, an alternative is to use market leverage, where debt is scaled by the market value of assets. In unreported regressions we find that the qualitative results in Panel B of Table V do not change when we replace the leverage deficit and leverage surplus with the measures based on market leverage.

The results in Panel A of Table V indicate that firms with low (high) ratings are more likely to experience improvements (declines) in ratings, which could be due to survival bias. To address this possibility we experimented with introducing additional indicator variables for the top three and the bottom three rating levels. However, as our results in Panel B of Table V, indicate, these indicator variables do not qualitatively change our results.

VI. Deviations from Target Ratings and Corporate Financing Decisions

In this section, we examine whether a firm's deviation from its target rating influences its future financing choices. To do this we examine whether deviations from target ratings have incremental impact on changes in leverage and the debt vs. equity issuance and repurchase choices after controlling for the effects identified in the earlier literature. Specifically, we estimate the following three regressions.

$$DI_{it}^{*} = \beta_{0t} + \beta_1 Rating\ Deficit_{it} + \beta_2 Rating\ Surplus_{it} + X\gamma + \varepsilon_{it}. \quad (5)$$

$$ER_{it}^{*} = \beta_{0t} + \beta_1 Rating\ Deficit_{it} + \beta_2 Rating\ Surplus_{it} + X\gamma + \varepsilon_{it}. \quad (6)$$

$$\Delta Leverage_{it,t+1} = \beta_{0t} + \beta_1 Rating\ Deficit_{it} + \beta_2 Rating\ Surplus_{it} + X\gamma + \varepsilon_{it}. \quad (7)$$

In (5), the dependent variable, *DI**, is a latent continuous variable measuring the propensity to issue debt rather than equity. Its observable counterpart is a binary variable set to one if the firm issues debt and set to zero if it issues equity. In (6), the dependent variable, *ER**, is a latent continuous variable measuring the propensity to repurchase equity rather than retire debt. Its observable counterpart is a binary variable set to one if the firm repurchases equity and set to zero if it retires debt. In (7), the dependent variable, *ΔLeverage*, is the change in the book debt ratio.

The set of control variables, *X*, includes plus and minus rating indicators, along with measures of operating and market performance and, in some specifications, measures of managerial discretion. In addition, the regressions include measures of the leverage deficit and surplus, which allow us to roughly gauge the extent to which firms target ratings versus debt ratios. The change in leverage regression also includes the beginning of the period debt ratio to control for mechanical mean-reversion induced by the fact that the debt ratio is constrained to be between zero and one. To control for macroeconomic factors, regressions (5) through (6) also include fixed year effects, β_{0t}.

The results are presented in Table VI. Panel A reports the results of debt vs. equity issue and repurchase choice models (5) and (6). Panel B reports the results of change in leverage regression (7). Consistent with the hypothesis that firms offset deviations from target rating, the results show that firms with rating deficits show a greater tendency to

issue equity rather than debt, retire debt rather than repurchase equity, and generally reduce their leverage ratios. In addition, firms with rating surpluses tend to repurchase equity rather than retire debt; however, the effect of a rating surplus on the probability of debt vs. equity issuance choice is insignificant. Moreover, its effect on change in leverage is perverse. A rating surplus is associated with reductions in leverage instead of increases.

Other results are generally consistent with the prior literature. Both leverage deficit and surplus have significant effects on changes in leverage with signs consistent with the hypothesis that firms offset deviations from their target debt ratio. In the debt vs. equity issue and repurchase choice regressions, only leverage deficit is significant. More profitable firms tend to issue debt and repurchase equity, consistent with the tradeoff theory. Higher stock returns are associated with reductions in leverage and equity issuance, consistent with the market timing hypothesis. However, higher market-to-book ratios are associated with equity repurchases, which is somewhat of a puzzle.

In general, the leverage deficit and surplus variables are somewhat better predictors of future capital structure changes than the ratings deficit and surplus variables. One might interpret this finding as indicating that leverage targets are more important than ratings target, however, there are also purely statistically explanations for this finding. First, since the leverage ratio is a continuous variable, the target leverage ratio may be estimated more accurately than the target rating. And second, to the extent that there is a forward-looking element to ratings, firms that are expected to lower their debt ratios in the future will have higher current ratings and lower ratings deficits, which will generate

a downward bias in our estimates of the effect of ratings deficits on future capital structure changes.

The coefficient estimates for the managerial discretion variables are more difficult to interpret. On one hand, we find that larger outside blockholdings (less managerial discretion) are associated with increases in leverage. On the other hand, we are more likely to observe equity repurchases when managers board sizes are larger (more discretion). Other discretion effects are insignificant. These results are somewhat in contrast with our finding that managers with more discretion choose higher credit ratings. One possible explanation is that these managers achieve higher ratings by following conservative investment policies rather than significantly reducing their debt, which is consistent with John and Litov (2008), who find that more entrenched managers pick safer investments along with higher leverage.

Similar to our analysis of changes in ratings, we test the robustness of our results regarding the corporate financing decisions in a number of ways. First, we replace book leverage based variables with their market leverage based counterparts. Second, we estimate the rating and leverage targets using rolling annual regressions on the latest five years of data only. Third, we replace the dependent variable in Panel B of Table VI (change in leverage) with an indicator set to one for leverage increases and set to zero for leverage decreases. In all of these cases, our results remain qualitatively unchanged, except the effect of rating deficit on change in market leverage is insignificant.

VII. Deviations from Target Ratings and Dividend and Acquisition Decisions

Although security issues and repurchases are likely to serve as the primary tool used to adjust firms' credit ratings towards their targets, credit rating dynamics may also have

a direct or indirect impact on other corporate decisions. In this section, we examine whether a firm's deviation from its target rating influences its dividend and acquisition decisions by estimating the following two regressions.

$$DIV_{it}^{*} = \beta_{0t} + \beta_1 Rating\ Deficit_{it} + \beta_2 Rating\ Surplus_{it} + X\gamma + \varepsilon_{it}. \quad (8)$$

$$ACQ_{it} = \beta_{0t} + \beta_1 Rating\ Deficit_{it} + \beta_2 Rating\ Surplus_{it} + X\gamma + \varepsilon_{it}. \quad (9)$$

In (8), the dependent variable, *DIV**, is a latent continuous variable measuring the propensity to change the dividend. Its observable counterpart, DIV, is a binary variable set to one if the firm increases its dividend in the current fiscal year and set to zero if it decreases the dividend.[35] In (9), the dependent variable, *ACQ*, measures funds used for acquisitions in the current fiscal year.[36] The set of independent variables in both regressions includes rating deficit and rating surplus as well as other variables used in our earlier regressions.

Our estimates of regression (8), both with and without the measures of corporate governance, are presented in Table VII. In both specifications, the results imply that firms with ratings that exceed their rating targets are significantly more likely to increase their dividends, which would tend to increase the likelihood of a downgrade. The effects of other capital structure and rating variables are insignificant. The presence of blockholders, an indication of less managerial discretion, is associated with a decline in the tendency to increase dividends.

The estimation results for regression model (9) with and without governance variables on the right hand side are presented in Table VIII. The results show that the

[35] Based on Compustat annual data item 26.
[36] Compustat annual data item 129, scaled by lagged total assets.

acquisition activity is significantly lower for firms rated below their target level or with leverage ratios above the target. These results are consistent with the hypothesis that firms with highly levered capital structures cut back on acquisitions to avoid further increases in financial leverage. Managerial discretion measures have no impact on acquisition activity.

VIII. Conclusion

Most executives would agree that, ceteris paribus, it is better to have a good credit rating. Yet very few firms have either a "AAA" or a "AA" rating. The reason is that achieving a high rating requires a firm to include a substantial amount of equity in its capital structure, and this can be very costly. Hence, high credit ratings are observed only for firms that are likely to benefit the most from a higher credit rating, e.g., growth firms that expect to be raising substantial capital in the future. In contrast, smaller firms that may require proportionally more equity in their capital structures to achieve the same rating tend to have lower ratings.

In addition to these costs and benefits, managerial preferences are also likely to affect the choice of the target rating. It is likely that managers enjoy the prestige associated with having a high rating along with the job security that is associated with low default probabilities. As a consequence, managers may make choices that lead to higher ratings when their ownership structure and board structure provides them the discretion to do so. Indeed, our results on the effects of corporate governance on credit ratings suggest that managers with greater discretion tend to choose higher credit ratings.

Our analysis of the determinants of changes in credit ratings and leverage provides further support for these hypotheses. Specifically, we find that the initial deviation from

the rating target is a strong predictor of subsequent changes in ratings, implying that firms tend to make financing and investment decisions that allow them to reach their target rating. Furthermore, we find that below-target firms tend to decrease their leverage whereas above-target firms tend to increase their leverage. These reactions are somewhat asymmetric with firms reacting stronger when their rating is below the target than when the rating is above the target.

Finally, our analysis shows that the tendency to maintain a target credit rating influences a firm's financing and other corporate decisions. For example, firms with below target ratings are less likely to issue debt, less likely to repurchase equity, and they tend to spend less for acquisitions. When their rating is above their rating target, however, they are more likely to repurchase equity and increase dividends.

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Table I
Ratings Sample

The letter ratings are transformed into numerical equivalents using an ordinal scale ranging from 1 for the lowest rated firms (CCC-) to 19 for the highest rated firms (AAA).

Year	1-3 CCC- CCC CCC+	4-6 B- B B+	7-9 BB- BB BB+	10-12 BBB- BBB BBB+	13-15 A- A A+	16-18 AA- AA AA+	19 AAA	Total
1985	2	94	97	84	131	60	13	481
1986	29	177	133	123	150	63	16	691
1987	21	193	145	113	148	60	18	698
1988	17	163	134	104	150	55	18	641
1989	15	132	125	115	139	55	18	599
1990	14	93	110	119	136	61	16	549
1991	15	83	115	129	144	59	14	559
1992	13	88	130	143	149	59	15	597
1993	4	110	170	161	154	57	14	670
1994	6	123	180	183	145	54	12	703
1995	7	148	184	201	162	50	12	764
1996	8	185	213	217	185	50	12	870
1997	8	205	248	260	193	46	12	972
1998	9	202	280	266	187	48	10	1,002
1999	12	208	295	281	167	40	10	1,013
2000	11	228	276	283	159	35	9	1,001
2001	20	204	285	291	158	34	8	1,000
2002	29	187	317	286	151	27	7	1,004
2003	23	204	338	279	154	27	9	1,034
2004	15	209	341	295	152	26	8	1,046
2005	14	194	304	241	141	21	7	922
Total	292	3,430	4,420	4,174	3,255	987	258	16,816
Percent	1.7%	20.4%	26.3%	24.8%	19.4%	5.9%	1.5%	

Table II
Sample Statistics

The table presents the sample means for variables important for our analysis. S&P500 indicator is set to one for firms that belong to S&P500 index. S&P400 indicator is set to one for firms that belong to S&P400 mid-cap index. NYSE indicator is set to one for firms traded on NYSE. Probability rated is the percentage of rated firms in the firm's industry. Young indicator is set to one for firms that are three years old or younger. Market-to-book is (total assets – book equity + market equity)/total assets. Tangibility is the property, plant, and equipment scaled by total assets. R&D is the research and development expense scaled by sales. R&D indicator is coded one when R&D is not missing. Selling expense is selling, general, and administrative expense net of R&D over sales. Profitability is (operating income)/assets. Size is the natural log of sales, adjusted for inflation. Leverage is (short-term debt + long-term debt)/assets. Large firm indicator is set to one if a firm is above the yearly median value in terms of firm size. Blockholder ownership is the percentage ownership by investors holding five percent or more of outstanding shares. Board size is the number of the directors on the board. Board independence is the percentage of outsiders on the board.

	No Rating	Rating
S&P500 indicator	0.022	0.246
S&P400 indicator	0.035	0.096
NYSE indicator	0.186	0.705
Young indicator	0.145	0.039
Probability rated	0.154	0.224
Market-to-book	1.795	1.581
Tangibility	0.278	0.371
R&D	0.046	0.021
Selling expense	0.278	0.183
Profitability	0.103	0.150
Size	3.893	6.956
Leverage	0.217	0.353
Blockholder ownership	0.382	0.318
Board size	6.922	10.170
Board independence	0.732	0.835
Observations	72,254	16,816
Governance observations	23,585	5,193

Table III
Rating Assignment Model:
Determining the Benefits and Costs of Achieving Higher Ratings

The table presents maximum likelihood estimates of the rating assignment model with sample selection correction. The rating assignment is modeled using an ordered probit specification. The sample selection (i.e., the probability of being rated) is modeled using a binomial probit specification. S&P500 indicator is set to one for firms that belong to S&P500 index. S&P400 indicator is set to one for firms that belong to S&P400 mid-cap index. NYSE indicator is set to one for firms traded on NYSE. Probability rated is the percentage of rated firms in the firm's industry. Young indicator is set to one for firms that are three years old or younger. Market-to-book is (total assets – book equity + market equity)/total assets. Tangibility is the property, plant, and equipment scaled by total assets. R&D is the research and development expense scaled by sales. R&D indicator is coded one when R&D is not missing. Selling expense is selling, general, and administrative expense net of R&D over sales. Profitability is (operating income)/assets. Size is the natural log of sales, adjusted for inflation. Leverage is (short-term debt + long-term debt)/assets. Blockholder ownership is the percentage ownership by investors holding five percent or more of outstanding shares. Board size is the number of the directors on the board. Board independence is the percentage of outsiders on the board. All variables are measured at the end of year t or over year t. Rho is the correlation between the error terms in the selection model and the rating model. Industry indicators are included in the rating assignment model as control variables but are not reported. The reported t-statistics reflect robust standard errors adjusted for heteroskedasticity and firm-level clustering. Coefficient estimates significantly different from zero at 5% and 1% level are marked * and **, respectively.

	Model without managerial discretion				Model with managerial discretion			
	Selection equation		Rating assignment equation		Selection equation		Rating assignment equation	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
S&P500 indicator	0.672**	9.7			0.665**	8.6		
S&P400 indicator	0.254**	3.9			0.225**	3.1		
NYSE indicator	0.506**	12.7			0.466**	9.5		
Young indicator	-0.374**	-10.0			-0.337**	-7.2		
Probability rated	1.515**	8.2			1.452**	6.6		
Market-to-book	-0.050**	-3.1	0.135**	6.0	-0.026	-1.4	0.135**	5.1
Tangibility	0.176*	2.2	0.898**	7.3	0.342**	3.5	0.785**	5.5
R&D	1.685**	8.4	-1.629**	-4.0	1.732**	6.3	-1.413**	-3.3
R&D indicator	-0.122**	-3.4	0.196**	4.2	-0.183**	-4.3	0.222**	4.1
Selling expense	0.163	1.4	0.983**	5.7	0.263	1.9	0.803**	3.9
Profitability	-0.292*	-2.3	2.326**	12.1	-0.511**	-3.4	2.548**	10.8
Size	0.528**	30.3	0.375**	10.3	0.566**	28.6	0.377**	9.1
Leverage	2.804**	34.3	-3.406**	-29.0	3.007**	29.4	-3.364**	-23.1
Blockholder ownership					0.054	0.9	-0.283**	-4.0
Board size					0.001	0.1	0.045**	6.1
Board independence					0.877**	5.2	-0.697**	-3.9
ρ	0.452**	6.1			0.440**	4.9		
Observations	89,070		16,816		57,326		11,098	

Table IV
Rating Choice Model:
Firm Characteristics and Credit Rating Targets

The table presents maximum likelihood estimates of the rating choice model with sample selection correction. The rating choice is modeled using an ordered probit specification. The sample selection (i.e., the probability of being rated) is modeled using a binomial probit specification. S&P500 indicator is set to one for firms that belong to S&P500 index. S&P400 indicator is set to one for firms that belong to S&P400 mid-cap index. NYSE indicator is set to one for firms traded on NYSE. Probability rated is the percentage of rated firms in the firm's industry. Young indicator is set to one for firms that are three years old or younger. Market-to-book is (total assets – book equity + market equity)/total assets. Tangibility is the property, plant, and equipment scaled by total assets. R&D is the research and development expense scaled by sales. R&D indicator is coded one when R&D is not missing. Selling expense is selling, general, and administrative expense net of R&D over sales. Profitability is (operating income)/assets. Size is the natural log of sales, adjusted for inflation. Leverage is (short-term debt + long-term debt)/assets. Blockholder ownership is the percentage ownership by investors holding five percent or more of outstanding shares. Board size is the number of the directors on the board. Board independence is the percentage of outsiders on the board. All variables are measured at the end of year t or over year t. Rho is the correlation between the error terms in the selection model and the rating model. Industry indicators are included in the rating assignment model as control variables but are not reported. The reported t-statistics reflect robust standard errors adjusted for heteroskedasticity and firm-level clustering. Coefficient estimates significantly different from zero at 5% and 1% level are marked * and **, respectively.

	Model without managerial discretion				Model with managerial discretion			
	Selection equation		Rating choice equation		Selection equation		Rating choice equation	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
S&P500 indicator	0.431**	6.1			0.443**	5.3		
S&P400 indicator	0.172**	2.9			0.155*	2.3		
NYSE indicator	0.349**	7.8			0.326**	6.0		
Young indicator	-0.349**	-10.2			-0.297**	-6.6		
Probability rated	1.748**	10.2			1.463**	6.8		
Market-to-book	-0.015	-1.0	0.151**	7.3	0.010	0.6	0.163**	6.8
Tangibility	0.165*	2.1	0.841**	6.9	0.347**	3.5	0.849**	5.8
R&D	1.868**	8.7	-0.211	-0.8	1.779**	7.6	-0.267	-0.8
R&D indicator	-0.085*	-2.4	0.153**	3.1	-0.153**	-3.6	0.169**	2.9
Selling expense	0.242*	2.1	0.967**	5.8	0.286*	2.1	0.841**	4.3
Profitability	0.026	0.2	2.415**	13.0	-0.242	-1.6	2.548**	11.1
Size	0.560**	31.1	0.732**	39.8	0.595**	29.5	0.710**	27.7
Leverage	2.982**	38.3			3.177**	32.4		
Blockholder ownership					-0.008	-0.2	-0.363**	-4.7
Board size					0.000	0.0	0.041**	5.3
Board independence					0.961**	5.5	0.124	0.7
ρ	-0.605**	-15.5			-0.542**	-10.9		
Observations	89,070		16,816		57,326		11,098	

Table V
Changes in Ratings

Panel A presents the distribution of firms with ratings (Rating Observations), firms with ratings in two consecutive years (Change in Rating Observations), the average rating change over one-year period (Change in Ratings), and the one-year survival rate across each rating category over the 1985-2004 period. Panel B presents the results of ordered probit regression models that examine one-year changes in ratings. Panel B1 presents the estimation results on the sample that excludes the CCC-, CCC, and CCC+ rated firms. Panel B2 presents the results estimated on the sample where the missing rating observations in the consecutive period are replaced with the predicted ratings obtained from the rating assignment regression. R(t) is the rating in year t. Rating deficit is (Target Rating - Rating) when positive and zero otherwise. Rating surplus is (Rating - Target Rating) when positive and zero otherwise. Leverage is (short-term debt + long-term debt)/assets. Leverage deficit is (Target Leverage - Leverage) when positive and zero otherwise. Leverage surplus is (Leverage - Target Leverage) when positive and zero otherwise. Plus rating is set to one if the firm has a plus rating and zero otherwise. Minus rating is set to one if the firm has a minus rating and zero otherwise. Profitability is (operating income)/assets. Carryforwards is net operating loss carryforwards/assets. Market-to-book is (total assets – book equity + market equity)/total assets. Blockholder ownership is the percentage ownership by investors holding five percent or more of outstanding shares. Board size is the number of the directors on the board. Board independence is the percentage of outsiders on the board. All independent variables are measured at the end of year t or over year t. Year indicators are included as control variables but are not reported. The reported t-statistics reflect robust standard errors adjusted for heteroskedasticity and firm-level clustering. Coefficient estimates significantly different from zero at 5% and 1% level are marked * and **, respectively.

Panel A: Distribution of changes in ratings and survival rates by initial rating

Rating	Rating Code	Rating Observations	Change in Rating Observations	Change in Rating	One-year Survival Rate
CCC-	1	41	26	0.92	63.4%
CCC	2	74	53	0.49	71.6%
CCC+	3	163	121	0.33	74.2%
B-	4	397	302	-0.05	76.1%
B	5	835	663	-0.22	79.4%
B+	6	2,004	1,694	-0.09	84.5%
BB-	7	1,771	1,561	-0.11	88.1%
BB	8	1,408	1,272	-0.08	90.3%
BB+	9	937	855	-0.08	91.2%
BBB-	10	1,238	1,158	-0.16	93.5%
BBB	11	1,510	1,415	-0.15	93.7%
BBB+	12	1,185	1,118	-0.17	94.3%
A-	13	995	942	-0.17	94.7%
A	14	1,314	1,261	-0.22	96.0%
A+	15	805	789	-0.24	98.0%
AA-	16	443	424	-0.17	95.7%
AA	17	423	415	-0.20	98.1%
AA+	18	100	97	-0.09	97.0%
AAA	19	251	248	-0.19	98.8%
All rated firms		15,894	14,414	-0.14	90.7%

Panel B: Predictive regressions of one-year changes in ratings with mitigated survival effects

	Panel B1						Panel B2					
	Exclude observations with ratings of CCC-, CCC, and CCC+						Replace missing ratings in consecutive periods with predicted ratings					
	R(t+1) - R(t)		R(t+1) - R(t)		R(t+1) - R(t)		R(t+1) - R(t)		R(t+1) - R(t)		R(t+1) - R(t)	
	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.
Rating	0.009*	2.3	-0.047**	-3.8	-0.063**	-4.3	0.001	0.2	-0.048**	-4.2	-0.061**	-4.3
Rating deficit	0.148**	12.1	0.091**	4.5	0.076**	3.5	0.140**	13.0	0.095**	5.3	0.088**	4.1
Rating surplus	-0.103**	-10.6	-0.060**	-4.0	-0.050**	-2.9	-0.089**	-9.6	-0.053**	-3.8	-0.043*	-2.5
Plus rating	0.026	1.1	0.024	0.8	0.007	0.2	0.033	1.5	0.037	1.2	0.009	0.2
Minus rating	0.009	0.4	0.017	0.5	-0.002	-0.1	0.006	0.3	0.009	0.3	-0.021	-0.5
Leverage deficit	1.487**	9.3	1.465**	7.1	1.536**	5.9	1.332**	8.8	1.258**	6.5	1.252**	5.0
Leverage surplus	-0.394*	-2.5	-0.445*	-2.1	0.092	0.4	-0.261	-1.8	-0.314	-1.6	0.126	0.6
Size			0.036	1.5	0.033	1.1			0.022	1.0	0.008	0.3
Profitability			1.812**	7.9	2.153**	7.5			1.437**	6.7	1.802**	6.6
Carryforwards			-0.230	-1.8	-0.252	-1.8			-0.209	-1.9	-0.260*	-2.0
Market-to-book			0.107**	4.6	0.097**	3.9			0.126**	5.6	0.116**	4.8
Stock return			0.645**	17.3	0.674**	14.9			0.535**	14.5	0.576**	12.7
Blockholder ownership					-0.174*	-2.1					-0.171*	-2.1
Board size					0.010	1.3					0.009	1.2
Board independence					-0.165	-1.1					-0.168	-1.1
Pseudo-R^2	0.037		0.082		0.094		0.034		0.071		0.085	
Observations	14,214		8,767		6,016		14,970		9,204		6,251	

Table VI
Target Ratings and Corporate Financing Decisions

The table presents the results of probit regressions predicting debt vs. equity issuance and equity repurchase vs. debt retirement choices (Panel A) and OLS regressions of one-year change in leverage (Panel B). Rating deficit is (Target Rating - Rating) when positive and zero otherwise. Rating surplus is (Rating - Target Rating) when positive and zero otherwise. Leverage deficit is (Target Leverage - Leverage) when positive and zero otherwise. Leverage surplus is (Leverage - Target Leverage) when positive and zero otherwise. Plus rating is set to one if the firm has a plus rating and zero otherwise. Minus rating is set to one if the firm has a minus rating and zero otherwise. Profitability is operating income/assets. Carryforwards is net operating loss carryforwards/assets. Market-to-book is (total assets – book equity + market equity)/total assets. Leverage is (short-term debt + long-term debt)/assets. All independent variables are measured at the end of year t or over year t. Year indicators are included as control variables but are not reported. The t-statistics reflect robust standard errors adjusted for heteroskedasticity and firm-level clustering. Coefficient estimates significantly different from zero at 5% and 1% level are marked * and **, respectively.

Panel A: Debt vs. equity choice regressions

	Debt vs. Equity Issuance		Debt vs. Equity Issuance		Equity vs. Debt Repurchase		Equity vs. Debt Repurchase	
	Coef.	z-stat.	Coef.	z-stat.	Coef.	z-stat.	Coef.	z-stat.
Rating deficit	-0.103**	-3.2	-0.129**	-2.8	-0.168**	-3.6	-0.207**	-3.3
Rating surplus	0.015	0.5	0.037	1.0	0.087**	2.8	0.116**	2.8
Plus rating	0.090	1.0	0.049	0.5	0.129	1.4	0.177	1.5
Minus rating	0.052	0.6	0.073	0.7	0.073	0.7	0.043	0.3
Leverage deficit	3.085**	5.8	2.504**	3.7	6.422**	10.4	6.691**	8.0
Leverage surplus	-0.259	-0.6	-0.696	-1.4	-1.180	-1.7	-1.343	-1.3
Size	0.172**	6.8	0.169**	4.5	0.348**	9.2	0.320**	5.5
Profitability	2.135**	4.5	2.336**	3.9	2.835**	5.1	3.894**	5.1
Carryforwards	-0.636*	-2.4	-0.709*	-2.4	-0.100	-0.2	0.438	1.3
Market-to-book	-0.029	-0.6	-0.034	-0.6	0.440**	6.7	0.389**	5.3
Stock return	-0.309**	-3.8	-0.264**	-2.8	-0.077	-0.8	-0.126	-1.0
Blockholder ownership			0.272	1.4			0.041	0.2
Board size			0.027	1.5			0.049*	2.6
Board independence			-0.439	-1.1			-0.540	-1.1
Pseudo-R^2	0.140		0.159		0.406		0.449	
Observations	2,241		1,507		1,923		1,285	

Panel B: Change in leverage regressions

	ΔLeverage(t,t+1)		ΔLeverage(t,t+1)	
	Coeff.	t-stat.	Coef.	z-stat.
Rating deficit	-0.003**	-3.3	-0.002*	-2.0
Rating surplus	-0.002**	-3.4	-0.003**	-4.1
Plus rating	-0.001	-0.6	0.001	0.3
Minus rating	-0.003	-1.4	-0.001	-0.5
Leverage deficit	0.172**	7.1	0.168**	6.6
Leverage surplus	-0.131**	-4.7	-0.148**	-4.8
Leverage	0.006	0.3	0.024	1.1
Size	0.004**	3.1	0.004**	3.2
Profitability	0.005	0.4	-0.009	-0.5
Carryforwards	-0.009	-0.8	-0.002	-0.2
Market-to-book	-0.004*	-2.3	-0.003	-1.5
Stock return	-0.008**	-3.1	-0.013**	-4.3
Blockholder ownership			0.010*	2.2
Board size			0.000	1.0
Board independence			0.007	0.8
R^2	0.077		0.082	
Observations	9,160		6,251	

Table VII
Target Ratings and Dividends

The table presents the results of probit regressions predicting the likelihood of a dividend increase vs. a dividend decrease. The dependent variable is set to one if the firm increases its dividend and set to zero if it decreases its dividend (Compustat annual data item 26). Rating deficit is (Target Rating - Rating) when positive and zero otherwise. Rating surplus is (Rating - Target Rating) when positive and zero otherwise. Leverage deficit is (Target Leverage - Leverage) when positive and zero otherwise. Leverage surplus is (Leverage - Target Leverage) when positive and zero otherwise. Plus rating is set to one if the firm has a plus rating and zero otherwise. Minus rating is set to one if the firm has a minus rating and zero otherwise. Profitability is (operating income)/assets. Carryforwards is net operating loss carryforwards/assets. Market-to-book is (total assets – book equity + market equity)/total assets. Leverage is (short-term debt + long-term debt)/assets. All independent variables are measured at the end of year t or over year t. Year indicators are included as control variables but are not reported. The reported t-statistics reflect robust standard errors adjusted for heteroskedasticity and firm-level clustering. Coefficient estimates significantly different from zero at 5% and 1% level are marked * and **, respectively.

	Coef.	z-stat.	Coef.	z-stat.
Rating deficit	-0.013	-0.5	0.042	1.0
Rating surplus	0.044**	2.6	0.060**	2.7
Plus rating	0.032	0.6	0.009	0.1
Minus rating	-0.033	-0.6	-0.045	-0.6
Leverage deficit	0.473	1.4	0.711	1.6
Leverage surplus	-0.488	-1.1	-0.374	-0.7
Size	0.100**	4.9	0.058	1.9
Profitability	2.110**	4.8	2.239**	3.8
Carryforwards	0.021	0.1	-0.371	-0.6
Market-to-book	0.030	0.8	-0.022	-0.6
Stock return	0.268**	3.3	0.290**	2.9
Blockholder ownership			-0.421**	-3.0
Board size			0.020	1.6
Board independence			-0.421	-1.5
Pseudo-R^2	0.063		0.069	
Observations	3,579		2,337	

Table VIII
Target Ratings and Acquisitions

The table presents the results of an OLS regression of funds used for acquisitions. The dependent variable is acquisitions (Compustat annual data item 129) scaled by lagged total assets. Rating deficit is (Target Rating - Rating) when positive and zero otherwise. Rating surplus is (Rating - Target Rating) when positive and zero otherwise. Leverage deficit is (Target Leverage - Leverage) when positive and zero otherwise. Leverage surplus is (Leverage - Target Leverage) when positive and zero otherwise. Plus rating is set to one if the firm has a plus rating and zero otherwise. Minus rating is set to one if the firm has a minus rating and zero otherwise. Profitability is (operating income)/assets. Carryforwards is net operating loss carryforwards/assets. Market-to-book is (total assets – book equity + market equity)/total assets. Leverage is (short-term debt + long-term debt)/assets. All independent variables are measured at the end of year t or over year t. Year indicators are included as control variables but are not reported. The reported t-statistics reflect robust standard errors adjusted for heteroskedasticity and firm-level clustering. Coefficient estimates significantly different from zero at 5% and 1% level are marked * and **, respectively.

	Coef.	z-stat.	Coef.	z-stat.
Rating deficit	-0.002**	-3.0	-0.003**	-3.6
Rating surplus	0.000	0.5	0.000	0.1
Plus rating	-0.001	-0.4	0.000	0.0
Minus rating	0.001	0.3	0.005	1.9
Leverage deficit	-0.005	-0.4	-0.005	-0.3
Leverage surplus	-0.024*	-2.0	-0.027*	-2.3
Size	-0.003**	-4.1	-0.004**	-3.9
Profitability	0.059**	4.8	0.063**	4.2
Carryforwards	-0.008	-1.2	0.001	0.1
Market-to-book	0.001	0.6	0.000	0.0
Stock return	0.008**	4.1	0.008**	3.7
Blockholder ownership			-0.005	-1.0
Board size			0.001	1.3
Board independence			0.006	0.6
R^2	0.034		0.038	
Observations	7,635		5,366	

Appendix: The Target Leverage Regression

It is important to note that our goal in estimating this regression (results presented below in Table A) is not to test the extant theories of target capital structure choice, but to obtain a proxy for target leverage. Our theoretical priors about the relation between various economic factors and target debt ratios lead us to start with the same set of variables used in the target rating model reported in Table IV.

To remain in our set of the determinants of target leverage, however, these variables have to pass a second screen. Specifically, only variables whose empirical relations with the observed debt ratios correspond with our theoretical priors are assigned to the target leverage regression. This screen eliminates profitability from our set of independent variables.

Earlier literature consistently reports that the relation between profitability and observed leverage ratios is negative. This relation holds in our sample as well. The negative relation between profitability and leverage is frequently attributed to pecking order behavior where firms have no target debt ratios and prefer internal funds to external financing. Alternatively, the relation can arise if firms that have target debt ratios operate in an environment where capital structure adjustments are costly, in which case deviations from target leverage induced by random shocks to profitability are not offset immediately via counteracting corporate financing transactions. Neither of these explanations implies that more profitable firms should have lower target debt ratios. As a result, it does not make sense to have a proxy for the target debt ratio that varies inversely with profitability.

Table A

	Coeff.	t-stat.
Market-to-book	-0.022**	-23.5
Tangibility	0.229**	23.9
R&D	-0.182**	-9.2
R&D indicator	-0.034**	-8.5
Selling expenses	0.009	1.0
Size	0.002**	2.7
R^2	0.173	
Observations	89,070	