DEBT FINANCING AND FINANCIAL FLEXIBILITY

Evidence from Pro-active Leverage Increases*

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Abstract

Firms that intentionally increase leverage through substantial debt issuances do so primarily as a response to operating needs rather than a desire to make a large equity payout. Subsequent debt reductions are neither rapid, nor the result of pro-active attempts to rebalance the firm's capital structure towards a long-run target. Instead, the evolution of the firm's leverage ratio depends primarily on whether or not the firm produces a financial surplus. In fact, firms that generate subsequent deficits tend to cover these deficits predominantly with *more* debt even though they exhibit leverage ratios that are well above estimated target levels. While many of our findings are difficult to reconcile with traditional capital structure models, they are broadly consistent with a capital structure theory in which financial flexibility, in the form of unused debt capacity, plays an important role in capital structure choices.

1. Introduction

The search for an empirically viable capital structure theory has confounded financial economists for decades. Standard trade-off models of capital structure have been criticized on the grounds that they do a poor job of explaining observed debt ratios. For example, traditional trade-off models have difficulty explaining why firms tend to issue stock after exogenous decreases in leverage (i.e. stock price run-ups), why leverage ratios are negatively related to profitability, and why firms seem to forego potentially large interest tax shields.[1] To address these shortcomings, financial economists have increasingly turned to dynamic models that incorporate financing frictions, frictions in real investment, or both.[2] Although these models take different forms, a common theme is that they are able to provide a rational explanation for observed discontinuities in financing behavior.

We contribute to this literature by studying a particular financing discontinuity – namely, large, pro-active increases in leverage. Our experimental design isolates those cases in which firms deliberately increase their leverage through substantial new borrowings. We then analyze why these firms choose to increase leverage and how their capital structures evolve over the subsequent years. In studying these transactions, our analysis is not intended to formally test specific models of financing behavior. Rather, we aim to document a set of empirical regularities that capital structure models must be capable of explaining. Our focus on large increases in leverage stems in part from the observation that these transactions are particularly

[1] See, for example, Baker and Wurgler (2002), Fama and French (2005), and Welch (2004) for evidence and discussion of firms issuing common stock after exogenous decreases in leverage; Strebulaev (2007) for a discussion of the negative relation between leverage and profitability; and Graham (2000) for estimates of the magnitude of interest tax shield foregone by the average firm.

[2] Perhaps the earliest example in this literature is Fisher, Heinkel, and Zechner (1989). More recent examples include Leary and Roberts (2005), Strebulaev (2007), Tserlukevich (2008), Dudley (2009), and DeAngelo, DeAngelo, and Whited (2010).

puzzling for capital structure theory. Even in the presence of frictions, capital structure models, particularly those that rely on adjustment costs, generally predict that management-initiated debt issues will decrease the firm's deviation from its target leverage ratio. Yet, Hovakimian (2004) finds that, on average, debt issues tend to increase the deviation of the firm's debt ratio from its estimated target.

Our sample consists of 2,318 instances between 1971 and 1999 in which firms substantially increase their total debt and for which the resulting market leverage ratio (defined as total debt over total debt plus the market value of equity) is at least 0.10 above our estimate of their long-run target debt ratio. In other words, the sample debt increases are deliberate increases in leverage (as opposed to leverage changes that result from exogenous changes in stock price) that lead to large deviations from estimated target leverage ratios. These pro-active debt issues that move the firm away from target leverage are precisely the types of events that are most puzzling for traditional capital structure models. On average, the sample firms increase their ratio of debt to value by 0.24, resulting in a leverage ratio that is 0.27 above their estimated target.

Our analysis indicates that the debt increases are primarily a response to operating needs rather than a desire to either swap equity for debt or to make a large cash payout. Of the 1,920 leverage increases for which we can accurately track the use of funds, we identify investment (primarily acquisitions and increased capital expenditures) as the primary use of funds in 1,058 (55%) cases. In another 687 (36%) cases, the funds are primarily used for increases in net working capital (primarily increases in accounts receivable and inventory), while in 94 (5%), the proceeds of the debt issue are used to cover reductions in operating profitability. The cases in which the primary use of funds is to make a payout to shareholders number just 81, comprising only 4% of the total. We conclude, therefore, that the observed leverage increases are primarily driven by a need for funds that is related to changes in the firm's investment opportunity set or (to a lesser extent) its flow of earnings. In fact, our analysis reveals that more than 90% of the sample firms would have been unable to pursue their operating policies without the proceeds from the debt issuance.

In the years subsequent to the initial jump in leverage, the sample firms reduce their leverage, on average. However, the subsequent debt reductions are neither rapid, nor the result of pro-active attempts (e.g. equity issues) to rebalance the firm's capital structure towards its long-run target. For those firms that survive for at least seven years, the excess leverage ratio (actual – target) declines substantially, but still remains a significantly positive 0.11. More interestingly, the evolution of the firm's leverage ratio appears to depend primarily on whether or not the firm produces a financial surplus (i.e. cash flow in excess of dividends, capital expenditures, and investments in working capital). As in Byoun (2008), firms that produce a surplus tend to use that surplus primarily for debt reduction rather than for increases in equity payouts or increases in the firm's cash balance. Moreover, we see little evidence of pro-active efforts (beyond the application of a surplus) to reduce the firm's leverage. In fact, firms that generate deficits tend to cover the deficit predominantly with *more* debt even though these firms exhibit leverage ratios that are already well above estimated target levels.

Although we defer a full discussion of the implications our findings for capital structure theories to a later section, we note that many of our findings are difficult to reconcile with existing capital structure models. For example, most trade-off models predict that large leverage increases of the type that we study will generally represent movements towards a (possibly new) target leverage ratio. Instead, the leverage increases appear to represent deviations from long-term targets. Nonetheless, although the subsequent rebalancing that we observe is consistent with the existence of a target debt ratio, the speed of adjustment is sufficiently slow and the adjustment process sufficiently passive so as to suggest that movement towards a target leverage ratio is not a first-order consideration for the sample firms. Under the pecking order theory, we expect that firms will use financial surpluses to first build cash reserves (i.e. slack), then retire debt before they would retire any equity. Contrary to these predictions, we find little evidence that the sample firms use surpluses to build cash and they often use surpluses to increase equity payouts (repurchases and dividend increases) when they could otherwise have retired debt.

Our findings are consistent with many of the features of a model in which financial flexibility in the form of unused debt capacity plays a central role in capital structure dynamics. This role is modeled in a recent study by DeAngelo, DeAngelo, and Whited (2010). In their model, firms have low long run leverage targets and debt issues represent pro-active responses to shocks to the firm's investment opportunity set. Rebalancing back to the low target can occur either slowly through regular principal and interest payments, or more aggressively if the firm has positive free cash flow realizations. In this setup, firms do not stockpile cash because doing so engenders agency and tax costs. Many of our findings conform closely to these predictions in that the sample debt increases are driven primarily by investment needs, while subsequent rebalancing towards the estimated target leverage ratio depends primarily on whether the firm's operations generate a financial surplus. Nonetheless, our finding that the sample firms often increase equity payouts when they could have more rapidly adjusted towards their target leverage ratio implies a more complicated rebalancing process than that predicted in DeAngelo et al. (2010).

The remainder of the paper is organized as follows. Section 2 details our sample selection process and describes the sample leverage increases. In Section 3, we present evidence on the dynamics of capital structure in the years following the initial increase in leverage. Section 4 discusses our findings in the context of existing capital structure theories and relates our findings to those of other studies of leverage adjustments. Section 5 concludes.

2. Sample Selection and Description of Leverage Changes

2.1 Identifying pro-active leverage changes

The starting sample consists of all U.S firms with total assets greater than $10 million between 1971 and 1999. We truncate the sample at 1999 to allow for the possibility of as many as seven years of data subsequent to the jump in leverage. This allows us to track the evolution of leverage in the post-jump years. Note, however, that we do not require that firms have the full seven years of data in order to be included in the sample. The data are obtained from the Compustat database, Industrial Annual file. Financial firms (SIC codes 6000 – 6999) and regulated utilities (SIC codes 4900 – 4999) are excluded as are firms missing data necessary for the calculation of leverage ratios.

We follow Harford et al. (2009) in our definition of market leverage and estimation of long run target leverage:

$$Market\ Leverage_{it} = \frac{D9_{it} + D34_{it}}{D9_{it} + D34_{it} + [D199_{it} \times D25_{it}]} \quad (1)$$

where Dx is a COMPUSTAT annual data item. D9 is the amount of long-term debt exceeding maturity of one year, D34 is debt in current liabilities, including the portion of long-term due within one year, D199 is the year-end common share price and D25 is the year-end number of common shares outstanding. Equation (1) is hereafter abbreviated (ML), the numerator is referred to as total debt (TD), and the denominator is referred to as market assets (MA).[3]

Our research design requires the computation of a proxy for the long-run target leverage ratio. We estimate a double-sided tobit regression model censored at 0 and 1 for each year contained in the sample using the following regression specification:

$$ML_{it} = \alpha + \beta_1[Med\ Ind\ ML]_{i,t-1} + \beta_2[M/B]_{i,t-1} + \beta_3[FA/TA]_{i,t-1} + \beta_4[OI/TA]_{i,t-1} + \beta_5[ln(TA)]_{i,t-1} + \varepsilon \quad (2)$$

Our selection of independent variables is motivated by Frank and Goyal (2009), who find that the most reliable factors influencing leverage decisions among US publicly traded firms are: median industry leverage (Med Ind ML), market-to-book ratio (M/B), asset tangibility (FA/TA), profitability (OI/TA), size (ln(TA)) and expected inflation. By estimating separate annual regressions, we are able to exclude expected inflation from the model as this variable is uniform across all firms within each year.[4] The other five variables are computed a follows:

The median industry leverage is computed each year for each four digit SIC code. We require that there be at least ten observations to use the median four digit SIC leverage. When the four digit code lacks ten observations, we use the median within the three digit code. If the three digit code also lacks ten observations, we use the median of the two digit code.[5]

Market-to-book ratio is computed as:

$$M/B_{it} = \frac{D6_{it} - D216_{it} - D35_{it} + [D199_{it} \text{ x } D25_{it}] + D10_{it}}{D6_{it}} \quad (3)$$

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[3] We also conduct all of our tests using a book leverage ratio, total debt divided by total asset. Because our results are not materially different using the book leverage measure, we report only the results using market leverage throughout the paper.

[4] We also estimate target leverage ratios using the full panel rather than separate annual regressions. Because these results are nearly identical, we do not report them in the paper.

[5] We use four-digit SIC codes for 38% of the observations, three-digit codes for 28% of the observations, and two-digit codes for 34% of the observations.

where D6 is total assets, D216 is book equity, D35 is deferred tax and D10 is liquidation value of preferred stock. We substitute D56, redemption value of preferred stock, when D10 is missing.

As a proxy for asset tangibility, we use the ratio of D8, fixed assets, over total assets. To measure profitability, we use the ratio of D13, operating income, over total assets. Size is measured as the natural log of total assets.

To identify the sample firms that increase leverage sufficiently so as to deviate substantially from target, we require that the change in leverage be at least 0.10 and that the post-jump leverage to be at least 0.10 above target. The difference between a firm's observed leverage and target leverage in a given year is hereafter referred to as excess leverage.

Our research design focuses on increases in leverage that are pro-active in nature. That is, we require the leverage increase to be predominantly the result of a debt increase as opposed to an exogenous decline in equity value. This requirement poses a difficult empirical challenge because both the numerator and denominator of the leverage ratio are typically changing. We cannot simply screen out large decreases in market equity because the decrease may be the result of a deliberate action such as an abnormally large payout. By the same token, we cannot simply assume constant market equity because large market equity increases may result from deliberate actions such as pursuing acquisitions or other positive NPV investments. To circumvent these difficulties while achieving our desired sample composition, we develop a variable, $\$\Delta ML$, that captures the value of additional debt represented by the change in leverage normalized by the change in value of market assets. Specifically,

$$\$\Delta ML_{it} = TD_{it} - TD_{i,t-1}\left[\frac{MA_{it}}{MA_{i,t-1}}\right] \tag{4}$$

To isolate firms whose leverage shifts are driven predominantly by an increase in debt, we require that the change in total debt be at least 90% of $\$\Delta ML$.

For firms that exhibit more than one jump during the seven year tracking period, we ignore jumps subsequent to the first jump to avoid double counting. We note, however, that these subsequent jumps are captured by our analysis of post-jump adjustment. After the seven-year tracking period, firms executing a subsequent jump are treated as an additional observation.

In order to allow for an analysis of the motivation for these leverage changes, we screen the sample based on the availability of Statement of Cash Flows (SCF) data. Further, we impose the requirement that at least 80% of the increase in debt observed on the balance sheet must be readily identified on the SCF. This set of requirements results in a sample of 2,318 observations, comprised of 2,166 unique firms. The motivation for the 80% screen is two-fold. First, it allows for an analysis of the use of debt proceeds by tracking the cash. Second, it isolates firms that increased leverage through an issuance of debt, which we consider pro-active, as opposed to acquisition of debt via merger and acquisition activity.

Figure 1 plots the annual frequency of pro-active leverage changes. Although there is some clustering of observations in 1973-74, 1984-1987, and 1998, the data indicate that large, pro-active leverage increases are fairly pervasive through time. It is notable that among the set of firms that are listed on Compustat for any number of years that qualify for inclusion during our sample period, over 20% appear in our sample. This suggests that the phenomena of large scale leverage increases are not rare events.

We also find that that large increases in leverage are widely distributed across industries. With the exception of the five industries that we exclude by construction (Banking, Trading, Insurance, Real Estate & Utilities), all of the 48 industries defined by Fama and French are represented in the sample. (These data are not reported in a table.) Further, no single industry dominates the sample. Only five industries comprise greater than 5% of the sample and no industry accounts for more than 10%. When compared to the population of firms over the same period, our sample follows a remarkably similar distribution.

2.2 Description of Leverage Changes

Table 1 reports descriptive statistics on the magnitude of the leverage changes. Prior to the leverage increase, the median firm exhibits a leverage ratio of 0.30. This increases to a median of 0.55 after the leverage increase. Before the leverage shift, the median firm exhibits a leverage ratio nearly identical to the target, rising to 0.24 above the target *ex post*. Thus, our sample selection process successfully identifies pro-active leverage increases that are economically meaningful. Nonetheless, our sample leverage changes are smaller than those observed in prior studies that narrowly focus on highly-leveraged transactions (HLTs). Correspondingly, therefore, the number of pro-active leverage changes identified by our procedure is many times larger than that studied in the prior HLT studies.[6]

2.3 Use of proceeds

To shed light on the underlying motivation for the debt issuance, we evaluate the SCF components of our sample. We group the firms into four main motivations for the debt issue: (i) to cover an operational cash shortfall due to an earnings shock (*OPERATIONS*), (ii) to execute a payout to equityholders (*PAYOUT*), (iii) to fund an increase in working capital (*WORKING CAPITAL*) and (iv) to fund an investment opportunity (*INVESTMENT*), which may be either internal such as capital expenditures or external such as a cash acquisition.

[6] See, for example, Andrade & Kaplan (1998) and Denis & Denis (1993) which use samples sizes of 31 and 39, respectively.

The categorization of firms into one of these four motivations is a multi-step process. First, we compute the total amount of cash (in dollars) used for deviations in each category:

OPERATIONS: Operating Cash Flow (OCF) is calculated in a manner that extracts working capital changes to differentiate these changes from earnings shocks.[7] Generally, this means starting with the figure reported as 'Cash from operations' on the SCF and then backing out working capital changes. When OCF results in a negative number, this figure is considered a use of cash for the purpose of covering an operational cash shortfall.

PAYOUT: The figure resulting from $(\text{Dividends+Repurchases})_t - (\text{Dividends})_{t-1}$ is considered to be cash used for the purpose of an equity payout increase. Consistent with prior literature (Healy and Palepu 1990; DeAngelo and DeAngelo 1990; DeAngelo, DeAngelo and Skinner 1994), this effectively assumes that the expected payout at time t is equal to the dividend paid during the prior year. Our figure represents the deviation from the expected value.

INVESTMENT: We calculate net investment (I) to include all cash used for investment activities such as capital expenditures, acquisitions and other investment activities.[8] From I, we subtract prior year capital expenditures to arrive at cash used to fund an increase in investment opportunities.

[7] Over the sample period, firms report cash flows using different formats which are identified by Compustat data item 318. This difference in reporting formats requires OCF to be calculated using different Compustat data items for codes 1, 2 & 3 than for code 7 to achieve a figure that is comparable across all firms in the sample. A detailed description of the components in the calculation is provided in Appendix A.

[8] As with OCF, I must be calculated using different components depending on the value of D318. Details are provided in the appendix.

WORKING CAPITAL: Change in working capital (ΔW) is calculated independently of other operating activities.[9] Any positive figure of ΔW is considered a use of cash to fund working capital needs.

Next, we divide the dollars used for each category by the net change in debt to identify the percentage of the new debt that is attributable to each motivation. This assumes that debt proceeds and proceeds from other sources are used in equal proportions. We sum the percentages of all categories for each firm to assess how much of the debt issue is captured through this analysis. If a given category comprises greater than 50% of the total % captured, we label that category as the primary use of funds.

As an example, in 1999 General Cable Corp. increased net debt by $452 Million. The proceeds were used within our four categories as follows (all dollar figures in millions, % of net change in debt in parentheses): *OPERATIONS*: $0 (they had positive operating cash flow), *PAYOUT*: $39.0 (8.6%), *INVESTMENT*: $398.6 (88.2%), *WORKING CAPITAL*: $31.8 (7.0%). In this example, the total percent captured sums to 103.7%. Sums greater than 100% are not uncommon as firms often have additional sources of funds from operations and/or equity issuances. *INVESTMENT* comprises 85% of the total percent captured; thus, our process flags *INVESTMENT* as the primary use of funds in this example. A review of the annual report confirms that the firm made a large cash acquisition.

The categorization process results in the loss of 398 observations. Firms in which no single motivation dominates are excluded as are firms in which we are unable to capture 50% of the net change in debt through the percentage use analysis. To illustrate one example of a situation in which this occurs, consider a firm that has a sizable debt issue in the year prior to the

[9] As with OCF and I, ΔW must be calculated using different components depending on the value of D318. Details are provided in the appendix.

jump and uses the cash predominantly for capital expenditures. In the subsequent year, they initiate an even larger debt issue which triggers inclusion in the sample and again the proceeds go primarily towards capital expenditures. The deviation in capital expenditures in this case would be much smaller than the jump year debt issue and thus, our method would fail to 'capture' the use of cash in this firm. We note that this is the conservative approach in that some firms that would otherwise be categorized as *INVESTMENT* may be omitted, but allows a much higher level of confidence that firms included in the sample are categorized correctly.

Table 2 provides a time profile of the overall sample and for sub-samples based on the primary motivation for the leverage increase. By far, the largest motivation is *INVESTMENT*, comprising more than all other categories combined and 55% of all observations in the sample. *WORKING CAPITAL* is the second largest at 36% of the total sample. *OPERATIONS* and *PAYOUT* are the primary motivation in only a trivial number of cases, comprising 5% and 4% of the firms in the sample, respectively. By contrast, prior studies on highly leveraged transactions (HLTs) have been limited to firms falling within the payout motivation. As noted in Denis and Denis (1993), this is due primarily to the fact that the HLTs were initiated as part of a response to hostile takeover attempts.

Within the *INVESTMENT* and *WORKING CAPITAL* categories, there are multiple components driving the change. In results not reported in a table, we find that capital expenditures and acquisitions make up the vast majority of net investment, accounting for 87% of the total. Firms reporting under SCF format codes 1, 2 and 3 lack detailed data regarding changes in working capital; however, for firms reporting under code 7, the data indicate that increases in accounts receivable and inventory account for over two thirds of the total increase.[10]

[10] 281 of the 738 *WORKING CAPITAL* firms report under SCF code 7.

Panel A of Table 3 reports descriptive statistics for the motivation sub-categories. The finding that the median % of new debt used for each motivation category exceeds 86% indicates that the firms have been categorized correctly. There are no significant differences between the categories with respect to mean pre-jump leverage. There are also no significant differences between the categories with respect to mean post-jump leverage, with the exception of the *WORKING CAPITAL* group which is slightly lower than the others, although still significantly above target.

In Panel B of Table 3, we report median changes for several key variables during the jump year. We note that acquisitions are reported as the observed figure rather than the change. Each variable is scaled by total assets to facilitate comparison across firms. The results provide further confirmation that we have correctly identified the primary motivations for the leverage increases. At the median, the *OPERATIONS* category experiences a large negative shock to operating earnings coupled with a large decrease in working capital, the *WORKING CAPITAL* category exhibits a large positive shock to working capital, the *INVESTMENT* category contains a large positive spike to capital expenditures and acquisitions, while the *PAYOUT* category exhibits a large positive shock to observed payout.

As further evidence on the use of funds, Panel A of Table 4 reports changes in cash holdings during the jump year. These results indicate that sample firms across all categories do not significantly increase their cash holdings. Rather, the median cash ratio among *INVESTMENT* category firms significantly decreases. This implies that firms are not issuing the debt with the intention of stockpiling cash. Further, in untabulated results, we find that cash holdings do not deviate significantly through time from the transaction year through seven years after the jump.

Panel B of Table 4 follows DeAngelo, DeAngelo and Stulz (2010) in calculating *pro forma* cash ratios based on the condition that the firm had not executed the financing. In other words, in Panel B, we analyze whether the firm could have covered the observed uses of funds with discretionary cash (DC). We define *pro forma* DC as cash on hand at the end of the prior year plus operating cash flow less all cash uses other than the primary motivation. Excess Cash (EC) is defined as DC less the cash used for the primary motivation. Specifically, discretionary cash and excess cash are defined for each motivation category as follows:

INVESTMENT:

$$DC_{it} = CASH_{i,t-1} + OCF_{it} - PAYOUT_{i,t} - CapEx_{i,t-1} - \Delta W_{it} \quad (5)$$

$$EC_{it} = DC_{it} - [I_{i,t} - CapEx_{i,t-1}] \quad (6)$$

WORKING CAPITAL:

$$DC_{it} = CASH_{i,t-1} + OCF_{it} - PAYOUT_{i,t} - I_{it} \quad (7)$$

$$EC_{it} = DC_{it} - \Delta W_{it} \quad (8)$$

PAYOUT:

$$DC_{it} = CASH_{i,t-1} + OCF_{it} - DIV_{i,t-1} - I_{it} - \Delta W_{it} \quad (9)$$

$$EC_{it} = DC_{it} - [PAYOUT_{i,t} - DIV_{i,t-1}] \quad (10)$$

OPERATIONS:

$$DC_{it} = CASH_{i,t-1} + PAYOUT_{i,t} - I_{it} - \Delta W_{it} \quad (11)$$

$$EC_{it} = DC_{it} + OCF_{it} \quad (12)$$

Both DC and EC are scaled by *pro forma* total assets, where *pro forma* total assets are computed by subtracting the net debt issuance from total assets.

The results in Panel B of Table 4 indicate that, by and large, the sample firms could not have financed their uses of funds with internal sources. The median deficit in *pro forma* EC/TA is large across all categories ranging from -0.14 to -0.26. The percentage of firms that would immediately run out of cash if operating and financing policies were not altered is substantial, ranging from 81.7% in the *OPERATIONS* group to 93.8% in the *WORKING CAPITAL* group.

3. Post-jump rebalancing

3.1 Evolution of leverage ratios

In Table 5 we begin to analyze the evolution of leverage following the jump year. Panel A reports a year by year evolution of the leverage for each motivation category. Figure 2 plots the evolution of mean leverage, excess leverage and target leverage for the overall sample. The data indicate that, on average, leverage ratios decline substantially in the seven years following the initial increase. The largest group, *INVESTMENT* exhibits average leverage of 0.56 in the year of the jump and declines to 0.41 after seven years. The *WORKING CAPITAL* group starts at 0.53 immediately after the leverage increasing transaction, and declines to 0.41 by seven years after the jump. The *OPERATIONS* and *PAYOUT* groups also exhibit similar reductions over the seven years after the jump. Despite these substantial reductions, however, all groups continue to exhibit significantly positive excess leverage after seven years. Excess leverage in the *INVESTMENT* group is 0.27 in the year of the jump and is still 0.11 above the estimated target seven years later. Similar results are observed in the other categories as well; excess leverage in the *WORKING CAPITAL, OPERATIONS* and *PAYOUT* groups are 0.13, 0.15 and 0.07 respectively after seven years. Furthermore, as shown in Figure 2, target leverage ratios are relatively stable through the sample period. Thus, the significantly positive excess leverage that we observe does not appear to be driven by time series variation in the target.[11]

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[11] Our results are robust to alternative measures of leverage and alternative estimation techniques. Specifically, we separately estimate leverage using book values, using long-term debt instead of total debt, and using the log of one

One concern with these findings is that survival rates differ between categories, with the *OPERATIONS* category losing a significantly higher percentage of firms compared to the other categories. To confirm that the evolution observed in Panel A is not being driven by survival bias, we report the mean change in leverage split by motivation over 3, 5 and 7 year time spans following the jump year. Due to attrition, sample sizes vary by the length of the period over which we are measuring the changes. Thus, the reported change in leverage at each interval is the average change from year 0 to year *t* for firms that exist in year *t*. The changes in leverage from year 0 to year 7 reported in Panel B are similar to those implied by the average levels of leverage reported in Panel A. All categories across all time horizons exhibit a trend back towards pre-jump leverage levels; however, while leverage continues to decrease, all categories continue to exhibit positive excess leverage on average even at the seven year mark. Across all categories, the mean leverage remains a significantly positive 0.11 above the target seven years after the pro-active jump.

The results from Table 5 indicate that the leverage increases observed in the sample are neither short term movements, nor movements to a new, permanent target ratio. If firms executed the debt placement to address a pressing need, but were strongly opposed to the high leverage, we would expect the excess leverage levels to be short lived with aggressive rebalancing following the initial jump. The post jump rebalancing behavior does not appear to differ drastically between the *INVESTMENT*, *PAYOUT* and *WORKING CAPITAL* motivation categories, while the *OPERATIONS* category firms appear to rebalance more aggressively. The high attrition rate in the *OPERATIONS* category indicates that there may be survival bias at

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plus interest coverage (EBITDA/interest expense) instead of a debt ratio. In addition, we estimate target leverage ratio using the system GMM procedure described in Lemmon, Roberts, and Zender (2008). Our findings are qualitatively identical in all cases. Note that in our experimental design, a fixed effects specification is not appropriate. By construction, all of the sample firms exhibit a large shift in leverage. Labeling such a shift as a 'fixed effect,' would mask much of the information about leverage dynamics that we seek to uncover.

work. It is possible that, following a negative earnings shock, the firm's survival is strongly related to its ability to get its leverage ratio back in line with pre shock levels. Nonetheless, the average rebalancing activity of the sample as a whole gives the impression that, while firms may be interested in moving back towards a target, there does not appear to be any great urgency.

3.2. Do firms pro-actively rebalance towards leverage targets?

One method by which companies can pro-actively reduce leverage is to issue equity. To explore whether the firms in our sample pursue a pro-active strategy of increased equity issuances, we analyze observed values of Compustat D108, sale of common and preferred stock. This data item captures various ways of introducing equity into a firm's capital structure ranging from proceeds from the exercise of employee options to seasoned equity offerings (SEOs), which tend to be larger. We define large issuances as those that exceed 5% of market assets. The time series of equity issuances is plotted in Figures 3A and 3B over the period from 3 years prior to the jump to 7 years after. While small issuances are commonplace and the percentage of firms engaging in such activity is relatively unchanged through time, large issuances not only fail to increase, but appear to drop dramatically after the jump in leverage, the opposite of what active rebalancing would imply. The proportion of firms engaging in a large equity issuance ranges from 16% to 23% in the three years prior to the jump but never exceeds 10.5% in any of the seven years after the jump. It is difficult to justify this reduction on the basis of cost sensitivity. There is no reason to believe that transaction costs associated with large equity issuances would differ substantially between the pre and post-jump periods. Moreover, if anything, we would expect that firms would be *less* sensitive to these costs following a large increase in leverage since the probability of distress increases with higher levels of leverage.

An alternative explanation is that the post-jump period is the 'normal' behavior and firms executed the debt issuances to offset abnormally high equity issuances in the years prior to the leverage jump. However, there are several reasons to be skeptical of this explanation. First, the leverage increasing transactions push the sample firms well above the estimated target. Second, the subsequent evolution of the sample firms' leverage ratios implies that the firms seek to move towards lower leverage levels, albeit slowly, over the years following the jump. This implies that the jump itself was not a rebalancing activity. Finally, evidence presented in Fama and French (2005) supports the notion that the higher, pre-jump, large issuance activity is more consistent with observed issuance activity in the general population.

While the decrease in large equity issuance activity is surprising in and of itself, it is even more striking to observe many firms actually increasing equity *payout*. Unlike dividends, repurchases are not sticky, so any repurchases or dividend increases can be viewed as discretionary rather than obligatory. Increased payouts subsequent to the initial jump use cash that could otherwise have been used to retire debt if the firms were aggressively pursuing a target. In other words, payout increases are discretionary diversions of cash away from debt reduction.

Table 6 reports *pro forma* mean leverage ratios if firms making discretionary payout increases had instead applied these funds to debt reduction. These data are also plotted in Figure 4. Since the average firm continues to exhibit excess leverage of 0.11 at year 7, it is notable that this figure could have been reduced by over 70% to 0.03 if cash used for discretionary payout increases had simply been applied to debt reduction.[12] It thus appears that the sample firms could have adjusted their capital structure towards long run targets without incurring any

[12] Approximately 2/3 of the discretionary payouts are share repurchases and 1/3 are dividend increases. Thus both payout methods contribute to the observed phenomenon in an economically meaningful manner.

significant transaction cost, but instead chose otherwise. Taken together, these results support the notion that while firms appear to be rebalancing, their actions are not as pro-active as would be expected under traditional capital structure models.

3.3. The response to deficits and surpluses

Further insight can be gained by analyzing how the sample firms adjust their capital structure (if at all) in response to subsequent cash flow deficits and surpluses. We define a Financial Surplus as:

$$FS_{it} = OCF_{it} - DIV_{i,t-1} - I_{it} - \Delta W_{it} + \Delta Cash_{it} \tag{13}$$

where OCF is operating cash flow, $DIV_{(t-1)}$ is the dividend payout from the prior year, I is net investment, ΔW is the change in working capital and ΔCash is the change in cash and short term investments.[13] In other words, taking observed values of operating cash flow, prior year dividend, net investment and working capital changes (other than changes in cash) as given, financial surplus captures discretionary cash that the firm can pay out to equity holders, use to reduce debt or stockpile as cash reserves. Although this definition is close to the 'financing surplus/deficit' used in Kayhan and Titman (2007) and Byoun (2008), we make two modifications that are necessary for our purposes. First, we use prior period dividend as opposed to current period dividend because we view a dividend increase as a discretionary use of surplus funds rather than an amount that should be taken as given when calculating the surplus. Secondly, we back out change in cash from change in net working capital. This allows us to take a step back and calculate the surplus prior to the firm's choice regarding the use or retention of cash, whereas previous specifications define surplus after the cash decision has been made.

[13] For firms with a value of '.C' for D274 (change in cash) in the Compustat database, this figure has been consolidated with D236 (Working Capital Change – other). To maintain consistency in the FS calculation, we replace .C with the change observed on the balance sheet and reduce D236 by the corresponding amount.

Under our definition, a firm would not have a smaller surplus simply because they chose to stockpile cash.

For years +1 to +7, there are 5,831 firm years exhibiting surpluses and 5,963 exhibiting deficits. As shown in Panel A of Table 7, the median surplus is $3.85 million. The median firm uses most (82%) of the surplus to reduce debt.

The results in Panel B of Table 7 report that financing deficits subsequent to the jump are covered predominantly with more debt. This is surprising for several reasons. First, it would seem to indicate that the extraordinary increase in leverage resulting from the jump did not exhaust the debt capacity of the firms. These are not firms that had already moved back to target; the average excess leverage among the deficit firms engaging in further borrowing is 0.22. Further, since these firms were required to access external financing to cover the deficit, most capital structure models would predict that they should access equity since, on average, they appear to be well above their long-run target.

In Table 8, we split the surplus and deficit firm-years according to whether the firm is above or below the estimated target leverage at the time. Not surprisingly, given our sample construction, the vast majority of observations are above target. To allow for direct comparison to leverage, Scaled Financial Surplus (SFS) is defined as:

$$SFS_{it} = \frac{FS_{it}}{MA_{it}} \tag{14}$$

Comparing ΔML vertically within each column, it is clear that the target has some impact on marginal financing decisions. At the median, a firm that realizes a cash surplus while above target reduces leverage by 0.05 while a firm that realizes a surplus while below the target also reduces leverage, but only by 0.02, a significantly lower figure. Similarly, at the median, a firm that realizes a cash deficit while above target increases leverage by 0.02 while a firm that realizes a cash deficit while below target increases by a significantly larger amount, 0.04.

However, consideration of the target is not the only force at work as seen in a horizontal comparison within each row. At the median, a firm that realizes a cash deficit while below target increases leverage by 0.04 while a firm that realizes a surplus while below the target *decreases* leverage by 0.02. Similarly perplexing, at the median, a firm that realizes a cash surplus while above target reduces leverage by 0.05 compared to a firm that realizes a deficit while above the target *increases* leverage by 0.02. Further movement away from target for firms necessitating external financing runs contrary to a policy of active rebalancing.

In Table 9, we evaluate the effects of financial surpluses while controlling for other determinants of leverage changes – e.g, operating earnings (EBIT), stock price performance, the book value of total assets, the ratio of market value to book value of assets, and the ratio of fixed assets to total assets. EBIT is scaled by market assets and fixed assets are scaled by book assets. Stock price performance is measured as the log one-year stock return. In the OLS model, t-statistics (in parentheses) are computed using White (1980) heteroscedasticity-consistent standard errors, while the Z-statistics in the logit model are computed using the Huber/White/sandwich estimator.[14]

Columns 1 & 2 of Table 9 report OLS estimates with the change in total debt scaled by market assets as the dependent variable. In column 1, the estimates are restricted to firms realizing a financial surplus; that is, SFS is positive. The negative and significant coefficient on SFS indicates that financial surpluses play an important role in the decision to retire debt. Further, while the dummy variable denoting firms above their target leverage is insignificant, the

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[14] We also estimate models in which standard errors are clustered by firm, by year, and by both firm and year (Petersen 2009). Because the results do not differ from those in Table 9 in any meaningful way, they are not reported in a table.

interaction of this dummy with the SFS variable is highly significant. This implies that the relationship between surplus cash flow and debt reduction is even stronger when the firm is above its long run target leverage ratio. In column 2, the same model is estimated for firms realizing a negative financial surplus, or in other words, a financial deficit. Again, the coefficient on the SFS variable is highly significant suggesting a strong relationship between financial deficits and debt issuances. Notably, this relationship is not affected by the firms' current leverage ratio relative to the target as the excess leverage dummy and interaction term are not significant.

Chang and Dasgupta (2009) argue that many tests of leverage ratios suffer from a lack of power and suggest an increased focus on issuance decisions. To address this concern, we report marginal effects from a logit model estimating the probability of debt issuance and equity issuance for deficit firms in columns 3 and 4 and debt reduction and equity repurchases for surplus firms in columns 5 and 6. All independent regressors other than the dummy variable in the logit model are scaled by standard deviation; thus, the marginal effects can be interpreted as the change in probability resulting from a one standard deviation change in the variable rather than a one unit change. The variables are scaled because a one unit change in ratios typically bounded by 1 can be difficult to interpret. As in Hovakimian (2004), we exclude dual equity and debt issues. We require the financing activity considered in the dependent variable to constitute at least 1% of market assets so that the activity is deemed to be 'meaningful.' Failure to impose this threshold could result in, for example, a large debt issuance being excluded due to a diminutive equity issuance via employee compensation or the like, which would cloud the inference drawn from our estimates.

Under the assumption that firms actively rebalance towards a target leverage ratio, we expect that positive excess leverage in firms with a positive financing deficit will have a negative effect on the probability of debt issuance (as opposed to equity). Contrary to this prediction, however, we find little evidence in columns 3 and 4 that the likelihood of either debt or equity issuance is related to the firms position above or below target. Instead, it is the SFS variable that has a highly significant relationship with the probabilities of both debt and equity issuance.

When the probabilities of debt retirement and equity repurchases are conditioned upon financing surpluses, evidence of active rebalancing appears but cash flow realizations remain important. As reported in columns 5 and 6, the SFS variable remains significant at the 5% and 1% levels respectively, but the dummy variable denoting positive excess leverage is now statistically significant in both specifications. That is, conditional on a financial surplus, the likelihood of debt reduction (share repurchase) is positively (negatively) related to whether the firm exhibits positive excess leverage.

Taken together, the results in Table 9 confirm that while there is some evidence that firms manage their leverage ratios towards a target, the evolution of the firm's leverage ratio appears to be driven primarily by financial surpluses and deficits rather than a determined pursuit of a target.

3.4. Alternative explanations

One explanation for our findings is that our sample selection process is biased towards identifying firms with high adjustment costs and those for which we underestimate initial target leverage ratios. That is, if adjustment costs are high, a firm will rebalance only when they are a long way from their target leverage ratio. Thus, by limiting the sample to those firms that choose to increase leverage through a substantial debt issue, our sample picks up only those firms who have chosen to rebalance towards a higher leverage ratio, and whose high adjustment costs prevented them from doing so earlier. Note that, under this explanation, the initial leverage increase that we observe is a move towards the 'true' target.

There are at least three reasons why we consider this explanation implausible. First, such large frictions appear at odds with Iliev and Welch's (2009) finding that the average non-stock-return caused change in leverage is about 9% per year. Large adjustment costs are also difficult to rationalize in the face of pervasive unused lines of credit (Sufi 2009), access to the commercial paper market (Kahl, Shivdasani & Wang 2008), and low-cost (non-SEO) methods of issuing equity (Fama and French 2005). Second, if the leverage changes we observe are movements towards the 'true' target, we expect that the sample firms would either stockpile the cash from the debt offer or use the proceeds to reduce equity. Instead, we observe that the leverage increases are a response to investment needs. Third, our evidence on subsequent rebalancing implies that our estimates of the target are economically meaningful. That is, the sample firms appear to rebalance towards our estimate of the target rather than treat the post-jump leverage ratio as if it is the true target.

Alternatively, it is possible that we have underestimated the post-jump target leverage ratio. For example, perhaps prior to the initial leverage increase, the sample firms have large, unexercised real options. Upon debt issuance, the option is exercised and the target leverage ratio increases. If our target estimation procedure fails to pick up the impact of the exercise of the growth option, we might underestimate the post-jump target and, therefore, underestimate the extent to which the sample firms rebalance towards the target in the post-jump years.

There are several reasons why we do not think that our results can be explained by an underestimate of post-jump target leverage ratios. First, to the extent that market-to-book ratios capture growth options, our estimate of target leverage will pick up the impact of the exercise of the growth option through the change in the firm's market-to-book ratio. Empirically, we do observe a substantial decline in the market-to-book ratio of the sample firms following the initial jump. However, the resulting impact on target leverage is far too small to account for our findings. Even if market-to-book ratios are just noisy proxies for the true growth opportunities, our empirical estimates of Eq (2) imply that the marginal impact of growth options on leverage ratios, though statistically significant, is economically small. Second, because the cross-section of leverage ratios is explained primarily by industry leverage ratios (which are measured without error), it is implausible that we underestimate the post-jump target leverage by 0.11, our estimate of year 7 excess leverage. Finally, we again note that the sample firms appear to rebalance towards our estimate of the target rather than treat the post-jump leverage ratio as if it is the true (new) target.

4. Discussion and Relation to Capital Structure Literature

As previously mentioned, our findings are difficult to reconcile with some aspects of traditional capital structure models. For example, in standard tradeoff models, firms balance the benefits of debt (e.g. tax benefits, reductions in agency costs) against the costs of debt (e.g. costs of underinvestment, distress costs) to arrive at a value maximizing leverage level. Although the magnitude of various costs and benefits of debt remain a matter of considerable debate, tradeoff models predict that firms will manage their capital structure towards the target leverage ratio that maximizes value.[15] Firms might deviate from target leverage if there are large adjustment costs, but any pro-active changes in leverage should represent either a deliberate rebalancing towards the firm's long-run target or a movement to a new target leverage.[16]

Contrary to these predictions, our sample leverage increases represent deliberate decisions to temporarily move the firm away from estimates of its long-run target leverage ratio. Moreover, although the sample firms do appear to rebalance their capital structures towards a long-run target in the years following the initial leverage increase, the nature of the rebalancing implies that the movement towards the long-run target is not a first-order consideration. First, the rebalancing process is quite slow.[17] Leverage ratios are still significantly above target levels seven years after the year of the initial jump. The persistence of excess leverage cannot be explained by substantial adjustment costs because we report evidence that many firms increase payouts to equity holders in the years subsequent to the initial leverage increase. If these funds had been used instead for debt reduction, average debt ratios in the sample would have been considerably closer to their long-run targets. Similarly, we find little evidence that the sample firms pro-actively seek to rebalance their capital structures through equity issues in the post-jump period. In fact, we find a substantial decrease in the proportion of firms completing large equity issuances in the years immediately following the leverage increase. Such behavior represents a puzzle for traditional capital structure models in that even if large equity issuances are costly, such costs would remain relatively unchanged following the leverage increase while

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[15] For evidence on the magnitude of debt-related costs and benefits, see Graham (2000), Harvey, Lins and Roper (2004), and Almeida and Philippon (2007).

[16] See Leary and Roberts (2005), Flannery and Rangan (2006), and Faulkender, Flannery, Hankins, and Smith (2008) for recent evidence on the role of adjustment costs in capital structure rebalancing decisions.

[17] Similarly, Harford, Klasa, and Wolcott (2009) report that leverage ratios revert slowly back towards target levels following debt-financed acquisitions.

the theoretical benefits (in the form of a movement towards a value-maximizing capital structure) would increase. The bottom line is that both the initial leverage increase and the subsequent rebalancing behavior of the sample firms are inconsistent with a model in which managing towards a long-run target is a first-order determinant of capital structure decisions.

Our findings are also difficult to reconcile with studies that suggest that firms target an optimal leverage 'range' [e.g., Fischer, Heinkel and Zechner (1989), Leary and Roberts (2005) and Strebulaev (2007)]. In these dynamic tradeoff models, firms tolerate deviation from their long run target as long as this deviation falls within an upper and lower bound, perhaps due, in part, to adjustment costs. Even in these models, however, any pro-active change in leverage should be towards the value-maximizing target, a prediction that is contradicted by our observation that a substantial number of our sample firms further increase their leverage when faced with a cash flow deficit despite already being well above our estimate of their target leverage ratio. At a minimum, therefore, our findings imply that there is an extremely wide range of leverage ratios over which managers behave as if they are relatively indifferent. However, if this is true, it reinforces our conclusion that managing leverage levels is not a first order concern for managers.

Some of our findings can be viewed as being consistent with the pecking order model developed by Myers (1984) and Myers & Majluf (1984) in that firms appear to utilize a large debt increase to implement operating plans for which they lack sufficient internal funds. Moreover, the fact that the sample firms seek additional debt financing when faced with a funding deficit in the years subsequent to the initial jump is also consistent with pecking order predictions. Nonetheless, several other findings in our study are difficult to reconcile with the pecking order model. For example, the pecking order predicts that firms will use financing surpluses to first build up cash reserves, then pay down existing debt before repurchasing equity or increasing dividends. Contrary to this prediction, however, we observe that many firms in our sample simultaneously pay down debt and repurchase equity in the years subsequent to the leverage increase. Moreover, we find little evidence that firms use either the initial leverage increase or subsequent surpluses to build cash reserves.

Many of our findings are consistent with the model of capital structure dynamics developed in DeAngelo, DeAngelo, and Whited (2010). In their model, financial flexibility in the form of unused debt capacity plays a central role in capital structure dynamics. The critical departure of their model from most capital structure models is the recognition of inter-temporal dependencies in financing activity. The opportunity cost of borrowing in the current period is the potential inability to borrow in future periods. Thus, *ex ante* optimal financial policies preserve the ability of the firm to access the capital market *ex post* in the event of unexpected earnings shortfalls or investment opportunities. Among other predictions, the model implies that unexpected capital needs will often lead to debt or equity issues that intentionally move the issuing company away from its long-run target debt ratio. Moreover, subsequent adjustments to the firm's leverage ratio will depend on cash flow realizations, the evolution of the firm's investment opportunity set, and capital market conditions. Therefore, marginal financing decisions will not necessarily follow a strict pecking order, nor will firms necessarily adjust very quickly to a target leverage ratio. Our findings are broadly consistent with these predictions. Nonetheless, the fact that we observe increased equity payouts in our sample firms when such cash surpluses could be used to pay down debt implies a slower rebalancing towards long-run target leverage ratios than is implied in DeAngelo et al. (2010).

Tserlukevich (2008) also presents a model of capital structure dynamics that features lumpy debt issuances, endogenous investment, and slow mean reversion in debt ratios. Although our findings are consistent with many of these features, our findings imply a more active rebalancing process than is modeled in the Tserlukevich (2008) model. In his model, leverage ratios decline with positive demand shocks due to increases in the value of growth options. While our results do not contradict this effect, we also find that firms actively pay down debt when they generate surplus funds.

Finally, our findings have implications for studies that use the speed of adjustment towards estimates of target leverage ratios as a test of tradeoff models of capital structure. Prior studies [e.g., Fama and French (2002), Flannery and Rangan (2006), Kayhan and Titman (2007), Huang and Ritter (2009), and Iliev and Welch (2009)] report relatively slow speeds of adjustment towards estimated targets. Our findings imply that such slow speeds of adjustment are due, in part, to firms deliberately issuing debt that moves the firm away from its long-run target debt ratio in order to fund new investment opportunities. As DeAngelo, DeAngelo, and Whited (2010) point out, such behavior is not necessarily inconsistent with the existence of target leverage ratios, and results in measures of the speed of adjustment that materially understate the incentives of firms to manage towards such targets.

5. Conclusion

Our analysis of large leverage increases indicates that these debt issuances represent pro-active movements away from long-run target leverage ratios in response to operating (primarily investment) needs. The sample firms subsequently rebalance towards their long-run leverage target; however, the subsequent debt reductions are neither rapid, nor the result of pro-active attempts (e.g. equity issues) to rebalance the firm's capital structure towards its long-run target. On average, the sample firms could rebalance nearly to their target leverage ratio if they simply avoid increasing dividends or repurchasing shares. Yet they choose not to do so. Moreover, many sample firms willingly take on even *more* debt when faced with cash flow deficits, despite already being substantially above target leverage.

Overall, our findings support the idea that unused debt capacity is an important source of financial flexibility. As such, they are consistent with DeAngelo and DeAngelo (2007), who argue that financial flexibility is a critical missing link in connecting capital structure theory with observed firm behavior. Moreover, such a view is consistent with that of surveyed CFOs, who state that financial flexibility is the most important determinant of capital structure (Graham & Harvey 2001).

Among our sample firms, there is little evidence that firms use outstanding cash balances as a source of flexibility. Although one could argue that our experimental design of isolating firms with large debt increases is biased against finding an important role for cash balances as a source of flexibility, we note that Daniel, Denis, and Naveen (2008) arrive at the same conclusion using a different experimental design. A possible implication of our findings, therefore, is that at any point in time, a firm's leverage ratio consists of both permanent and transitory components. The permanent component represents the company's long-run target, while the transitory component reflects the evolution of the firm's cash flows and operating needs. When firms have funding needs, they borrow to take advantage of opportunities. When subsequent cash flows are sufficiently high relative to operating needs, they pay down this debt towards their long-run target leverage ratio.

In this sense, our findings complement recent studies that propose a prominent role for transitory debt sources – e.g. lines of credit and commercial paper programs – in capital structure. For example, Sufi (2009) shows that revolving credit agreements comprise a large proportion of the outstanding debt obligations of most firms. Moreover, the average firm has unused lines of credit that are twice as large as the line of credit capacity that has been utilized. Similarly, Kahl, Shivdasani, and Wang (2008) conclude that commercial paper provides financial flexibility to firms with uncertain prospects and funding needs. As pointed out in DeAngelo, DeAngelo, and Whited (2010), the use of these types of transitory debt sources implies that firms arrange their capital structures in a way such that they consist *ex ante* of unused debt capacity that can be used *ex post* should funding needs arise.

Appendix A

Calculation of OCF:

When D318 equals 1, 2 or 3:

$$OCF = D123+D124+D126+D106+D213+D217+D218 \quad \text{(A1)}$$

where D123 is income before extraordinary items, D124 is extraordinary items and discontinued operations, D126 is deferred taxes, D106 is equity in net loss, D213 is loss on the sale of PPE and/or investments, D217 is funds from operations and D218 is other sources of funds.

When D318 equals 7:

$$OCF=D308-D302-D303-D304-D305-D307+D314 \quad \text{(A2)}$$

where D308 is net cash flow from operations, D302 is decrease in accounts receivable, D303 is decrease in inventory, D304 is increase in accounts payable and accrued liabilities, D305 is increase in accrued taxes, D307 is other change in assets and liabilities and D314 is exchange rate effect.

Calculation of I:

When data318 equals 1, 2 or 3, net investment (I) is calculated as:

$$I=D128+D129+D113+D219-D107-D109 \quad \text{(A3)}$$

where D128 is capital expenditures, D129 is acquisitions, D113 is increase in other investments, D219 is other use of funds, D107 is proceeds from the sale of PPE and D109 is proceeds from the sale of investments.

When data 318 equals 7, I is calculated as:

$$I=D128+D129+D113-D107-D109 -D310 \quad \text{(A4)}$$

where and D310 is other investing activities.

Calculation of ΔW:

When D318 equals 1, change in working capital (ΔW) is calculated as:

$$\Delta W = D236 + D274 \quad \text{(A5)}$$

where D236 is other change in working capital and D274 is increase in cash.

When D318 equals 2 or 3, ΔW is calculated as above except the sign is reversed on D236.

When D318 equals 7, ΔW is calculated as:

$$\Delta W = D274 - D302 - D303 - D304 - D305 - D307 - D309 - D312 \quad \text{(A6)}$$

Where D309 is change in short term investments and D312 is other financing activities.

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Table 1

Description of leverage changes

The sample includes 2,318 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. We compare market leverage for the fiscal year ending just prior to the jump year (Pre-jump leverage) with that for the fiscal year of the jump (Post-jump leverage). Excess leverage is defined as the difference between the observed leverage and the firm's estimated target leverage.

Variable	**Median**	**Mean**	**Lower Quartile**	**Upper Quartile**
Pre-jump leverage	0.299	0.312	0.163	0.446
Post-jump leverage	0.545	0.559	0.434	0.680
Pre-jump excess leverage	0.023	0.038	-0.068	0.130
Post-jump excess leverage	0.240	0.272	0.165	0.353

Table 2
Time profile of leverage increasing transactions

The sample includes 2,318 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. A firm is considered trackable if the majority of the cash proceeds from the debt issuance can be traced to a particular use. 1,920 of the sample firms are trackable. The *INVESTMENT* motivation captures increases in capital expenditures and cash acquisitions, the *WORKING CAPITAL* motivation captures increases in working capital, the *PAYOUT* motivation captures dividend increases and repurchases and the *OPERATIONS* motivation captures operational cash shortfalls resulting primarily from earnings shocks.

	Total	Total	Motivation			
Year	**sample**	**trackable**	**Investment**	**Working Cap**	**Payout**	**Operations**
1971	35	32	24	8	0	0
1972	74	54	38	15	0	1
1973	177	124	69	55	0	0
1974	215	143	70	69	1	3
1975	22	16	7	8	1	0
1976	44	32	14	13	1	4
1977	96	76	40	29	4	3
1978	61	45	23	17	4	1
1979	78	46	29	14	1	2
1980	46	30	17	8	3	2
1981	82	63	43	16	4	0
1982	76	50	30	15	4	1
1983	34	27	10	10	4	3
1984	134	125	58	52	7	8
1985	91	83	41	32	6	4
1986	132	124	62	51	5	6
1987	113	106	51	44	7	4
1988	83	75	34	31	3	7
1989	74	68	39	23	4	2
1990	59	54	29	22	0	3
1991	25	22	10	5	1	6
1992	30	28	13	10	2	3
1993	24	22	11	7	1	3
1994	84	77	41	32	0	4
1995	75	72	42	28	1	1
1996	62	59	33	18	2	6
1997	94	84	47	20	6	11
1998	125	118	84	22	8	4
1999	73	65	49	13	1	2
	2318	**1920**	**1058**	**687**	**81**	**94**
% of trackable firms			55%	36%	4%	5%

Table 3
Analysis of jump year activity by motivation

The trackable sample includes 2,109 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. Firms are categorized under a particular motivation when the majority of cash proceeds from the debt issuance can be traced to a specific use. Panel A reports the mean and median percentage of cash from the debt issuance that is used for the motivation to which the firm is categorized. We compare leverage for the fiscal year ending just prior to the jump year (Pre-jump leverage) with that for the fiscal year of the jump (Post-jump leverage). Panel B reports median changes in several key variables during the jump year. Acquisitions are reported as the observed figure rather than the change. Each variable is scaled by jump year total assets to facilitate comparison across firms.

Panel A: Use of proceeds for main motivation

Main Motivation	#	Mean % of debt used for main motivation	Median % of debt used for main motivation	Mean Pre-jump leverage	Mean Post-jump leverage
Investment	1058	101%	97%	0.289	0.555
Working Capital	687	92%	86%	0.303	0.527
Operations	94	106%	86%	0.349	0.590
Payout	81	110%	103%	0.282	0.587

Panel B: Median changes during jump year

Main Motivation	#	OI change	WC change	CapEx change	Acquisitions	Payout change
Investment	1058	0.013	0.010	0.035	0.027	0.000
Working Capital	687	0.006	0.113	0.009	0.000	0.000
Operations	94	-0.139	-0.134	-0.007	0.000	0.000
Payout	81	0.005	-0.016	0.004	0.000	0.252

Table 4
Cash Holdings

The trackable sample includes 1,920 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. Firms are categorized under a particular motivation when the majority of cash proceeds from the debt issuance can be traced to a specific use. Panel A compares median cash ratios within each motivation category from the fiscal year ending just prior to the jump year with that for the fiscal year of the jump. The cash ratio is defined as cash divided by total assets. The difference is tested using a Wilcoxon (rank sum) test, p-values are in parentheses. Panel B reports pro-forma discretionary and excess cash ratios. *Pro forma* Discretionary Cash (DC) is defined as cash plus operating cash flow less uses of cash outside the primary motivation. It measures the amount of cash available to the firm to execute a change in their respective motivation category. *Pro forma* Excess Cash (EC) is defined as DC less the amount of cash used for their primary motivation. Both figures are scaled by *pro forma* total assets defined as total assets less net debt issuance.

Panel A: Time series median cash holdings by motivation

	INVESTMENT		WORKING CAPITAL		OPERATIONS		PAYOUT	
	#	cash/TA	#	cash/TA	#	cash/TA	#	cash/TA
Pre-jump	1056	0.055	687	0.037	94	0.039	81	0.037
Post-jump	1058	0.033	687	0.039	94	0.031	81	0.031
Difference		-0.023		0.001		-0.008		-0.006
		(<0.0001)		*(0.417)*		*(0.27)*		*(0.128)*

Panel B: *Pro forma* cash coverage ratio without debt issuance

Main Motivation	#	Median DC / TA	Median EC / TA	% of firms with negative EC
Investment	1054	0.045	-0.260	90.4%
Working Capital	682	0.019	-0.162	93.8%
Operations	93	0.026	-0.140	81.7%
Payout	80	0.062	-0.183	82.5%

Table 5
Evolution of leverage

The trackable sample includes 1,920 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage (ML) is defined as total debt over the sum of total debt and market value of equity. Firms are categorized under a particular motivation when the majority of cash proceeds from the debt issuance can be traced to a specific use. Excess leverage is defined as the difference between the observed leverage and the firm's estimated target leverage. Panel A reports mean leverage and excess leverage for surviving firms in each year from the jump year to seven years after the jump, partitioned by primary motivation. Panel B reports the mean change in leverage for surviving firms over time horizons of three, five and seven years after the jump, partitioned by primary motivation. Mean excess leverage observed at the end of the measurement period is reported for each category. P-values are in parentheses.

Panel A: Time series mean leverage by motivation

Years after	**INVESTMENT**			**WORKING CAPITAL**			**OPERATIONS**			**PAYOUT**		
jump	#	ML	Excess ML	#	ML	Excess ML	#	ML	Excess ML	#	ML	Excess ML
0	1058	0.555	0.274	687	0.527	0.254	94	0.590	0.316	81	0.587	0.294
1	965	0.557	0.232	641	0.536	0.224	74	0.595	0.312	71	0.541	0.236
2	894	0.544	0.206	590	0.513	0.196	62	0.502	0.222	63	0.546	0.237
3	801	0.527	0.195	529	0.497	0.188	43	0.447	0.176	57	0.513	0.214
4	723	0.511	0.184	498	0.479	0.175	35	0.388	0.124	51	0.465	0.153
5	669	0.484	0.162	452	0.443	0.146	32	0.379	0.123	52	0.422	0.128
6	608	0.440	0.124	422	0.421	0.129	30	0.358	0.113	48	0.385	0.083
7	557	0.411	0.107	395	0.412	0.128	26	0.383	0.149	46	0.359	0.071

Panel B: Mean change in ML of surviving firms over various periods

	jy to jy+3			**jy to jy+5**			**jy to jy+7**		
	#	**ΔML**	**Excess year 3**	**#**	**ΔML**	**Excess year 5**	**#**	**ΔML**	**Excess year 7**
Investment	801	-0.018	0.195	669	-0.066	0.162	557	-0.133	0.107
		(0.034)	*(<.0001)*		*(<.0001)*	*(<.0001)*		*(<.0001)*	*(<.0001)*
Working Capital	529	-0.027	0.188	452	-0.085	0.146	395	-0.108	0.128
		(0.010)	*(<.0001)*		*(<.0001)*	*(<.0001)*		*(<.0001)*	*(<.0001)*
Operations	43	-0.107	0.176	32	-0.175	0.123	26	-0.200	0.149
		(0.009)	*(<.0001)*		*(0.0004)*	*(0.015)*		*(0.0004)*	*(0.006)*
Payout	57	-0.049	0.214	52	-0.126	0.128	46	-0.193	0.071
		(0.052)	*(<.0001)*		*(0.0003)*	*(0.0002)*		*(<.0001)*	*(0.041)*
All	1430	-0.025	0.193	1205	-0.078	0.153	1024	-0.128	0.114
		(<.0001)	*(<.0001)*		*(<.0001)*	*(<.0001)*		*(<.0001)*	*(<.0001)*

Table 6
Pro forma excess leverage
if cash used for discretionary payout increases was applied to debt reduction

The trackable sample includes 1,920 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. Excess ML is defined as the difference between the observed market leverage and the firm's estimated target. *Pro forma* adjusted leverage is computed by applying cash used for discretionary payout (dividend increases and repurchases) to debt reduction. *Pro forma* excess leverage is defined as the difference between the adjusted leverage and the firm's estimated target leverage.

Years after jump	#	**Actual** mean excess leverage	***Pro forma*** mean excess leverage
0	1920	0.270	0.270
1	1750	0.232	0.226
2	1608	0.204	0.187
3	1430	0.193	0.165
4	1307	0.177	0.132
5	1205	0.153	0.079
6	1108	0.124	0.053
7	1024	0.114	0.031

Table 7
Response to financial surpluses and deficits

The trackable sample includes 1,920 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. Excess leverage is defined as the difference between the observed leverage and the firm's estimated target. In Panels A and B we track the years subsequent to the jump and look at how firms react to the realization of a financial surplus or deficit. The surpluses sample includes 5,831 firm-year observations between 1972 and 2006 in which the firm realizes a positive financial surplus. Financial Surplus (FS) is defined as operating cash flow less prior year dividend less net investment less non-cash changes in working capital. The deficits sample includes 5,963 firm-year observations between 1972 and 2006 in which the firm realizes a negative financial surplus, otherwise known as a financial deficit. The percentage used and percentage covered variables are winsorized at the 1st and 99th percentiles to mute the effect of outliers on the observed mean.

Panel A: Use of financial surpluses

Variable	Mean	Median	25th Percentile	75th Percentile
Financial Surplus ($MM)	37.20	3.85	1.23	13.59
Equity Issuance ($MM)	5.70	0.00	0.00	0.27
% of surplus used for debt reduction	77%	82%	29%	105%
% of surplus used for payout increase	14%	0%	0%	7%
% of surplus used for cash increase	7%	10%	-9%	57%

Panel B: Coverage of financial deficits

Variable	Median	
Financial Deficit ($MM)	5.54	
% of deficit covered by equity issuance	1%	
% of deficit covered by debt issuance	78%	
% of deficit covered by payout reduction	0%	
% of deficit covered by cash reserves	6%	
Avg excess leverage of firms covering with debt		0.22

Table 8

Leverage changes partitioned by position relative to target and realization of financial surplus or deficit

The sample includes 11,477 firm-year observations between 1972 and 2006. Market leverage is defined as total debt over the sum of total debt and market value of equity. Change in market leverage (ΔML) is the difference between leverage in the observation fiscal year and leverage in the year immeadiately preceeding it. Excess leverage is defined as the difference between the observed leverage and the firm's estimated target leverage. When excess leverage takes a positive (negative) value, the firm is labeled *ABOVE* (*BELOW*). Financial Surplus (FS) is defined as operating cash flow less prior year dividend less net investment less non-cash changes in working capital. Positive (negative) values of FS are labeled *SURPLUS* (*DEFICIT*). Scaled Financial Surplus (SFS) is defined as FS divided by the sum of total debt and market equity. SFS is winsorized at the 1st and 99th percentiles.

		SURPLUS				**DEFICIT**		
		SFS	**ΔML**	**Excess Lev**		**SFS**	**ΔML**	**Excess Lev**
ABOVE	Mean	0.143	-0.064	0.280	Mean	-0.118	0.015	0.248
	Median	0.074	-0.050	0.259	Median	-0.080	0.017	0.225
	N	4,721	4,721	4,721	N	4,644	4,644	4,644
		SFS	**ΔML**	**Excess Lev**		**SFS**	**ΔML**	**Excess Lev**
BELOW	Mean	0.103	-0.022	-0.114	Mean	-0.121	0.065	-0.116
	Median	0.053	-0.020	-0.096	Median	-0.080	0.039	-0.093
	N	897	897	897	N	1,215	1,215	1,215

Table 9

Effects of Financial Surpluses on the change in total debt and the probability of financing activities

The sample includes 7,851 firm-year observations between 1972 and 2006. Firms are classified as issuing (repurchasing) a security when the net amount issued (repurchased) exceeds 1% of the market value of assets. Scaled change in total debt (SΔTD) is defined as the dollar change in total debt from t-1 to t divided by market assets at time t. Market leverage is defined as total debt over the sum of total debt and market value of equity. Excess leverage is defined as the difference between the observed leverage and the firm's estimated target leverage. When excess leverage takes a positive value, the dummy variable D(*above)* takes a value of 1. Financial Surplus (FS) is defined as operating cash flow less prior year dividend less net investment less non-cash changes in working capital. Scaled Financial Surplus (SFS) is defined as FS divided by the sum of total debt and market equity. Columns 1 & 2 report OLS regression results with scaled change in total debt as the dependent variable. Columns 3 - 6 report marginal effects from a logit model where the dependent bianary variable takes a value of 1 when the firm took the specifed action. All independent variables other than the dummy were scaled by standard deviation in the logit model. Standard errors are corrected for heteroscedasticity. Absolute value of t statistics (OLS) and z statistics (logit) are in parentheses and are significant at 5% when marked with * and at 1% when marked with **. R-squared figures for logit model are psudo R-squared.

CF realization	Surplus	Deficit	Conditional upon Deficit		Conditional upon Surplus	
Dependent Variable	SΔTD	SΔTD	Pr(Debt Issuance)	Pr(Equity Issue)	Pr(Debt Reduction)	Pr(Repurchase)
SFS	-0.215	-0.464	-0.195	0.114	0.045	0.039
	*(2.87)***	*(6.88)***	*(3.24)***	*(3.29)***	*(2.13)**	*(3.09)***
D(above)	0.009	-0.006	-0.024	-0.040	0.056	-0.092
	(1.26)	*(0.86)*	*(0.72)*	*(1.76)*	*(2.18)**	*(4.19)***
SFS*D(above)	-0.574	0.002	-0.045	-0.070	0.175	-0.016
	*(7.37)***	*(0.02)*	*(0.86)*	*(2.01)**	*(5.92)***	*(1.38)*
EBIT/MA	0.01	0.014	0.041	-0.010	0.013	0.044
	(1.88)	*(0.79)*	*(0.41)*	*(0.60)*	*0.88*	*(2.04)**
Log StkRtn	0.018	0.01	0.017	0.025	-0.014	0.004
	*(4.83)***	*(1.79)*	*(1.37)*	*(3.41)***	*(2.27)**	*(0.94)*
Log TA	0.003	0.01	0.050	-0.005	-0.002	0.012
	*(2.95)***	*(6.64)***	*(4.88)***	*(0.89)*	*(0.36)*	*(2.01)**
Mkt/Book	-0.011	0	-0.351	0.003	0.227	-0.006
	*(4.10)***	*(0.14)*	*(4.88)***	*(0.66)*	*(3.73)***	*(0.21)*
Fixed Assets	-0.004	0.006	0.016	-0.007	0.024	-0.013
	(0.39)	*(0.65)*	*(1.83)*	*(1.09)*	*(3.55)***	*(1.96)**
Constant	-0.013	-0.036				
	(1.19)	*(3.78)***				
Σ (SFS & Interaction)	-0.79	-0.46				
R-squared	0.64	0.14	0.06	0.02	0.09	0.04
Log Likelihood			-2310.4	-1312.7	-2092.6	-1344.4
Observations	4,103	3,748	3,748	3,748	4,103	4,103

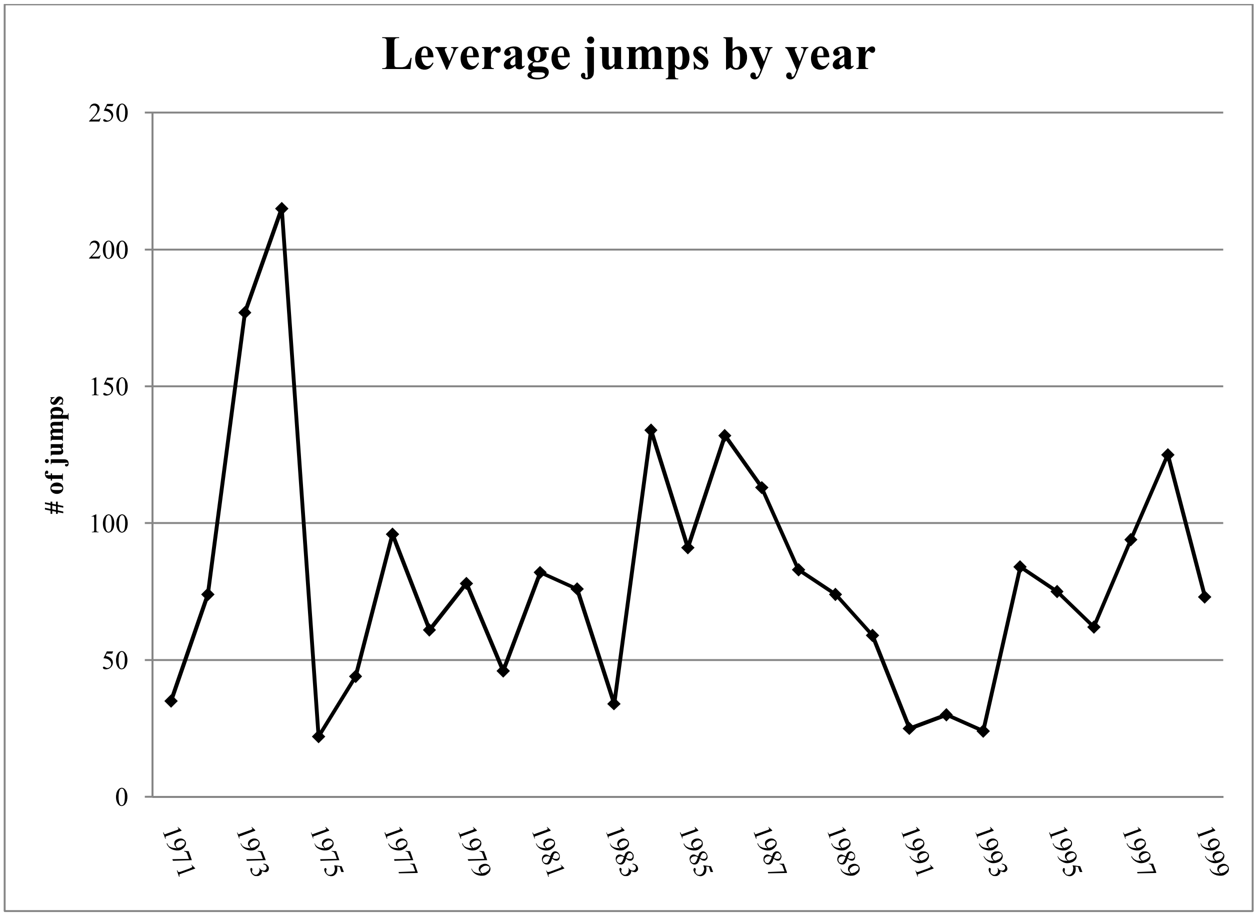


Fig. 1. Number of observed pro-active leverage jumps over sample period. The sample includes 2,318 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity.

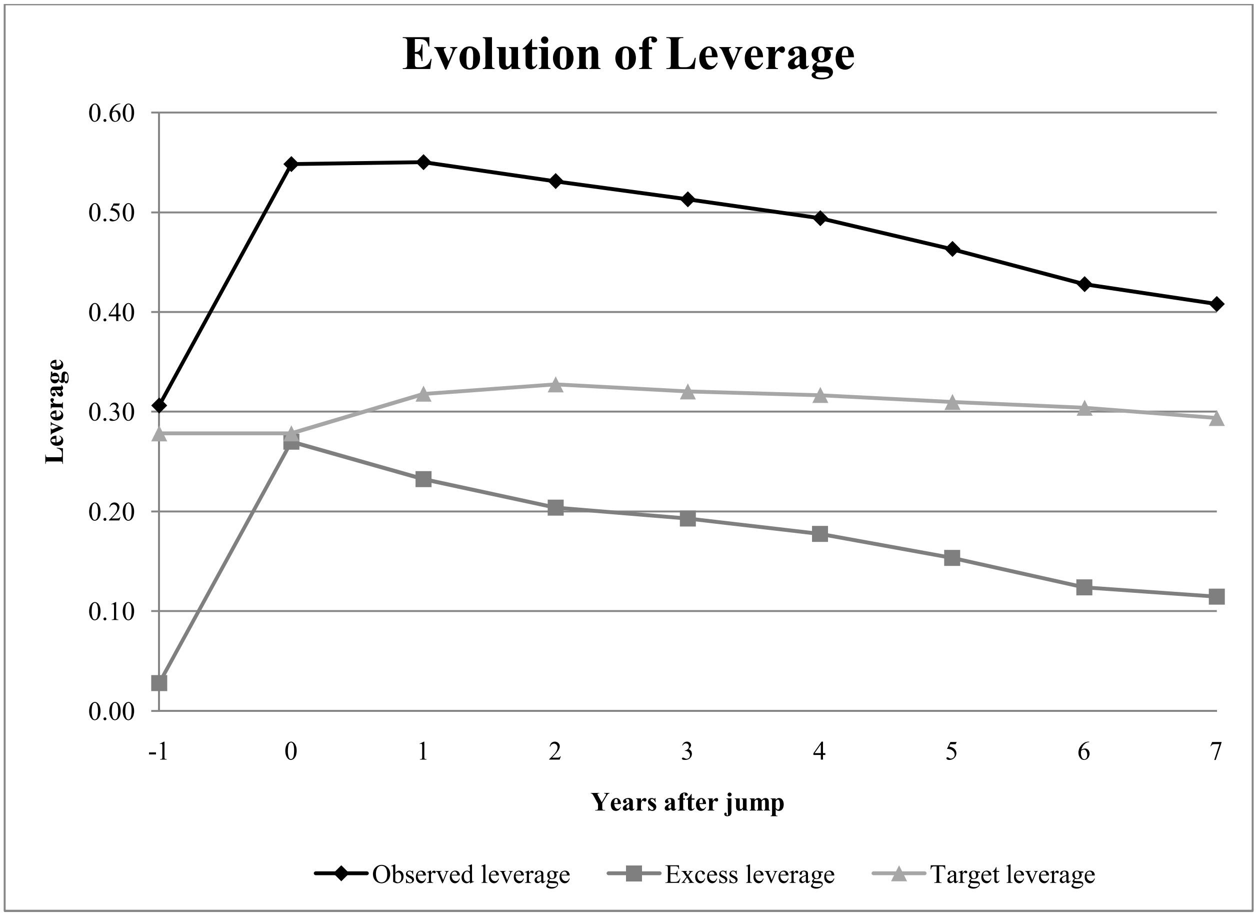
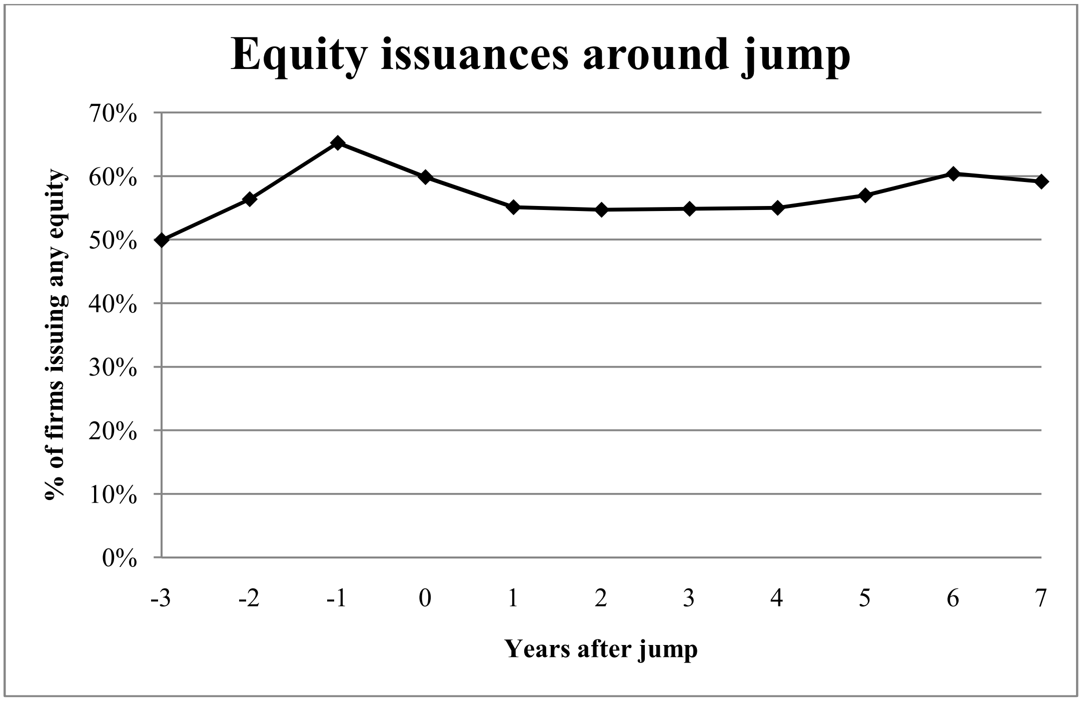


Fig. 2. Evolution of leverage, excess leverage and estimated long run target leverage of sample firms during seven years after the leverage changing transaction. The trackable sample includes 1,920 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity.



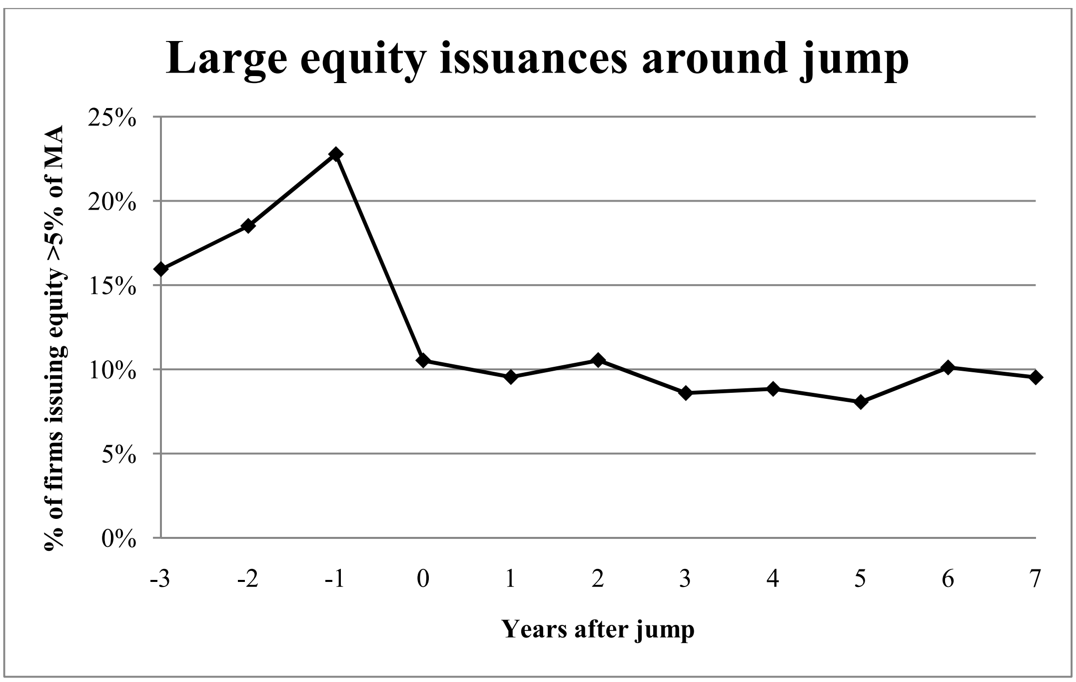


Fig. 3A and 3B. Observed equity issuance activity of sample firms over period from three years prior to jump to seven years after the jump. The trackable sample includes 1,920 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. For each year from three years prior to the jump to seven years after the jump, we report the mean percentage of firms issuing equity, defined as any positive value observed under Compustat data item 108 (sale of common and preferred stock), and the mean percentage of firms executing a seasoned equity offering, defined as an equity issuance greater than 5% of market assets.

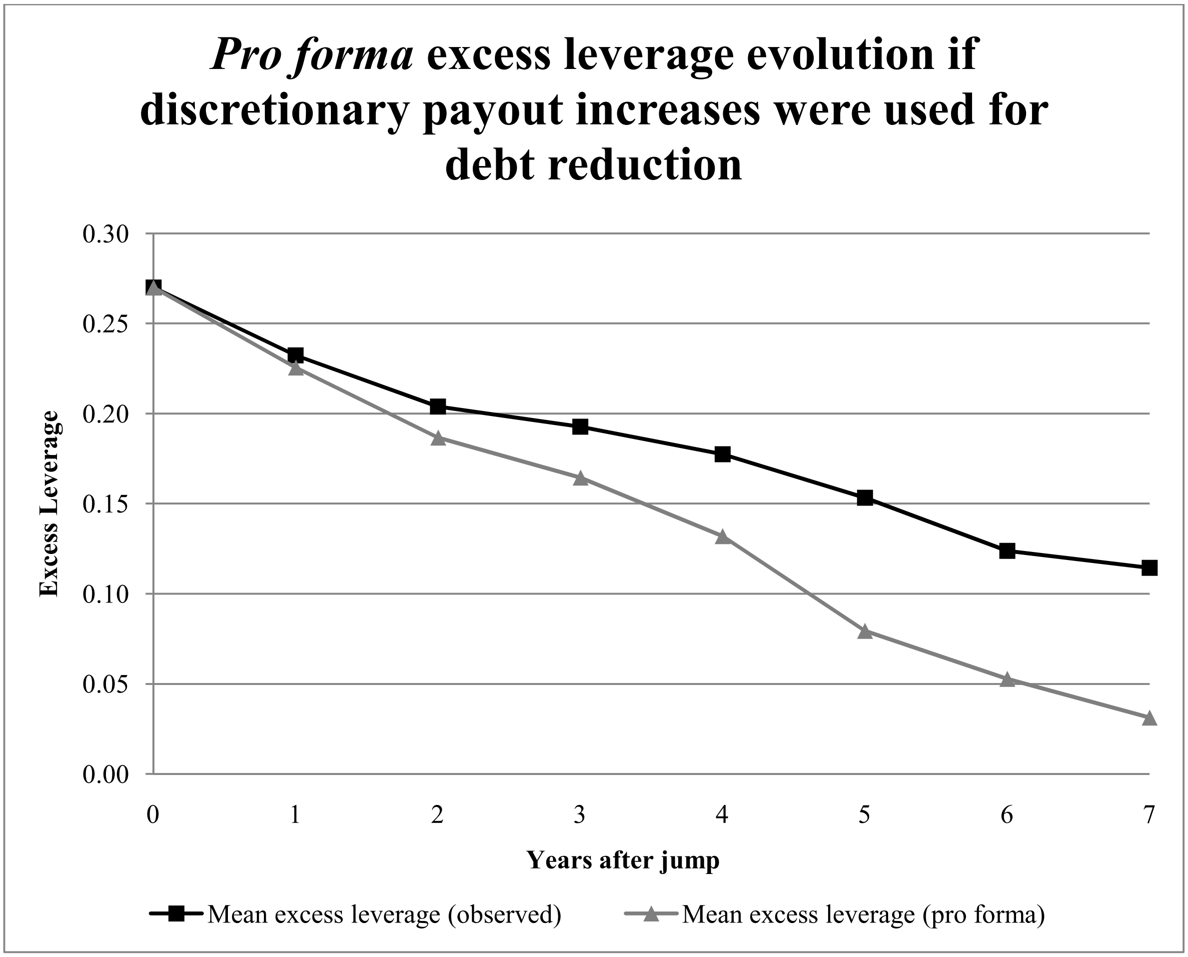


Fig. 4. *Pro forma* excess leverage evolution over the seven years following the jump if discretionary payout increases were used for debt reduction. The trackable sample includes 1,920 firm-year observations between 1971 and 1999 in which the firm increases its market leverage by at least 0.1 to a level that is at least 0.1 above its estimated long-run target. Market leverage is defined as total debt over the sum of total debt and market value of equity. Excess leverage is defined as the difference between the observed leverage and the firm's estimated target leverage. *Pro forma* adjusted leverage is computed by applying cash used for discretionary payout, dividend increases and repurchases, to debt reduction. *Pro forma* excess leverage is defined as the difference between the adjusted leverage and the firm's estimated target leverage.