

Leverage and Corporate Performance: Evidence from Unsuccessful Takeovers

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ABSTRACT

This paper finds that, on average, targets that terminate takeover offers significantly increase their leverage ratios. Targets that increase their leverage ratios the most reduce capital expenditures, sell assets, reduce employment, increase focus, and realize cash flows and share prices that outperform their benchmarks in the five years following the failed takeover. Our evidence suggests that leverage-increasing targets act in the interests of shareholders when they terminate takeover offers and that higher leverage helps firms remain independent not because it entrenches managers, but because it commits managers to making the improvements that would be made by potential raiders.

THE MARKET FOR CORPORATE CONTROL was quite active and controversial in the 1980s. Although there were many successful takeovers, there were also many takeover attempts that failed. Consequently, an analysis of the behavior of firms that successfully resist takeover attempts is needed to fully understand the economic effects of corporate control activity. In this paper, we investigate this issue by examining a sample of 573 unsuccessful takeover attempts during the 1982 to 1991 period.

In many of the failed takeovers, the target's management expressed the opinion that the acquirer's offer was insufficient and that the firm would be worth more if it remained independent. For example, 47 targets in our sample explicitly announced that they were rejecting offers because "the price is too low or inadequate." In response to these 47 announcements, target stock prices declined 3.42 percent on average. Whatever the stated reason, it is clear that investors are generally skeptical when target managers terminate a takeover attempt. In our entire sample, target stock prices decline 5.14 percent, on average, around the date of the termination announcement.

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It is often said that “talk is cheap” and that “actions speak louder than words.” However, in many cases, target managers combine their cheap talk with meaningful actions. In particular, many of the targets of failed takeovers substantially increased their leverage ratios, which can be viewed as either a signal (e.g., Ross (1977)) or a commitment (e.g., Grossman and Hart (1982) or Jensen (1986)) that the promised improvements would in fact take place. In our sample of 328 targets of failed takeovers with adequate data, 207 increased their leverage ratios. The median level of total debt scaled by the book value of assets of these firms increased from 59.8 percent one year before the unsuccessful takeover attempt to 71.5 percent one year afterward.¹

These leverage increases appear to be part of the targets’ defensive strategies. Targets of hostile takeover attempts increase leverage ratios three times as much as their friendly counterparts. This indicates that leverage increases may reduce the probability that a firm will be taken over in the future. Indeed, we find that only 38 percent of the target firms that increased their leverage ratio more than the median between years -1 and $+1$ are taken over in the five years following the initial failed takeover attempt. In contrast, 57 percent of the target firms that increased their leverage ratios less than the median are taken over within five years.

The existing literature suggests two possible explanations for this observed relation between leverage changes and subsequent takeover activity. First, as mentioned above, an increase in leverage can increase the credibility of a target manager’s promises, which in turn increases the target’s stock price, thereby increasing the cost of the takeover.² Second, leverage can increase the cost of the target without improving its value by improving the target’s bargaining power.³ In contrast to the first explanation, the second explanation does not imply that increased debt, following failed takeovers, should lead to increased performance.

Our empirical evidence supports the view that higher leverage ratios deter takeovers because they are associated with performance improvements. In particular, we find that the operating performance of former targets following failed takeover attempts is positively related to the change in the target’s leverage ratio. This finding continues to hold after controlling for

¹ Berger, Ofek, and Yermack (1996) report similar evidence for a much smaller sample of Fortune 500 firms. Denis (1990), using a sample of 37 firms that announced a defensive plan of either a large dividend or a stock repurchase, reports that long-term debt of firms that remain independent after a takeover contest increases from 21.0 percent in the precontest period to 42.6 percent in the postcontest period.

² Zweibel (1996) presents a model along these lines which is based on the overinvestment models of Jensen (1986) and Stulz (1990). See also Stein (1988) who discusses how the possibility of a takeover increases a firm’s incentive to signal its value.

³ Harris and Raviv (1988) and Stulz (1988) find that leverage increase makes the target firm more costly to take over because it increases the percentage ownership of the target’s management. In Israel (1991), increased debt deters takeovers that result in wealth transfers to the target’s existing debtholders. These explanations are not necessarily mutually exclusive. Firms might, for example, repurchase shares to increase the cost of a takeover and, in doing so, inadvertently commit to a higher output level and lower investment level because of the increased leverage.

management turnover (documented by Denis and Serrano (1996)), and several other characteristics of unsuccessful takeovers that may explain performance. We also document that failed targets that increase leverage the most decrease investment, sell off assets, reduce employment, and increase the focus of their firms, which supports the views expressed by Jensen (1986).

An analysis of the targets' stock prices reveals that investors partially anticipate the positive effects of higher leverage on the firms' future performance when the takeover attempts are terminated. For example, the cumulative prediction errors (CPEs) between five days before the announcement date of a takeover attempt to five days after the termination date are higher for those targets that increase leverage the most. Furthermore, the termination period returns are less negative for those targets that increase leverage the most.

The fact that target returns were negative around the termination date suggests that target managers were not acting in the interests of their shareholders. However, our analysis of the long-term performance of targets that terminate takeover offers suggests that the market underestimated the effect of higher leverage on future performance, which in turn implies that target managers who increased leverage may have been acting in the interest of shareholders when they terminated these takeovers. In particular, target firms that increased leverage more than the median have higher stock returns in the years following the termination date than a matched sample of firms of similar size, book-to-market, and momentum. In contrast, targets that increased their leverage less than the median significantly underperformed their matching benchmarks during this time period, suggesting that, on average, the shareholders of these firms would have been better off if the takeover had not been terminated.

This paper is organized as follows: Section I describes the sample and examines the use of leverage as a defense against unwanted takeovers. Section II examines the investment decisions of firms that increased their debt ratios. Section III reports the frequency of asset sales, changes in employment, and the focusing of operations. Section IV examines the relation between leverage and operating performance following failed takeover attempts. Section V analyzes stock returns around the termination announcements. Section VI investigates the relationship between the long-run stock price performance and leverage. Section VII summarizes and concludes the paper.

I. Sample Description

A. Sample Selection

The sample of unsuccessful takeovers is obtained from *W.T. Grimm Mergerstat Review*, which provides a listing of 721 terminated takeover attempts during the 1982 to 1991 period. Of these firms, 573 have data available on COMPUSTAT data files.⁴ The W.T. Grimm data set makes no restriction on

⁴ The 573 target firms have valid data on book value of assets in the year prior to the failed takeover attempt in both research and primary COMPUSTAT data files. Of these, 532 targets have valid debt data in the year prior to the failed takeover attempt year.

Table I
Characteristics of Sample Firms

The number and percentage of transactions terminated by bidders and others is reported for a sample of 573 unsuccessful takeovers for the period 1982 to 1991 obtained from *Mergerstat Review*, published annually by *W.T. Grimm*. Panel B includes the frequency of targets receiving subsequent offer(s) within one year through five years. Panel C reports the number of targets delisted from CRSP by year for each of the major criteria for delisting. The number of months denotes time from the termination of the takeover attempt.

Panel A: Distribution by Identity of Terminator					
	No. of Firms		Percentage		
Higher bid	75		13%		
Mutually rejected	63		11%		
No reason given	86		15%		
Rejected by target	183		32%		
Terminated by bidder	154		27%		
Miscellaneous	12		2%		
Total	573		100%		

Panel B: Distribution of Targets Receiving Subsequent Offer(s) and Number of Successful Offers				
Time of Subsequent Offer(s)	No. of Firms	Percentage	No. of Successful Offers	Percentage
One year	187	33%	156	27%
Two years	241	42%	208	36%
Three years	265	46%	232	40%
Four years	297	52%	261	45%
Five years	316	55%	278	48%

Panel C: Distribution of Targets Delisted from CRSP within <i>j</i> Months					
Number of Months	CRSP Criteria for Delisting				
	Takeover	Liquidation	Bankruptcy	Insufficient Capital	Other Delisting
1-12	156	3	1	4	24
13-24	208	7	5	8	32
25-36	232	9	5	14	38
37-48	261	9	6	16	40
49-60	278	10	8	17	47

the fraction of shares sought by bidders. The data set includes the announcement of the transaction, the termination date, the offered price, the premium offered, the means of payment, the names of the target and the bidder, and the reason for the cancellation when available.

The sample of 573 firms consists of 274 (48 percent) Nasdaq-listed targets and 299 (52 percent) targets listed on NYSE/AMEX. Panel A of Table I reports the distribution by terminator of the transaction. The table reveals

that 27 percent of the transactions were terminated by bidders and the remaining 73 percent failed for other reasons. "Other reasons" includes 32 percent of takeover attempts rejected by targets, 11 percent mutually rejected, 15 percent with no reason given in either *Mergerstat Review* or *The Wall Street Journal Index*, 13 percent due to a higher bid, and 2 percent for miscellaneous reasons. In 1988, W.T. Grimm did not report the reason for termination. For these cases, the *Wall Street Journal Index* is used instead. Panel B of Table I shows the number of target firms that received subsequent offer(s) after the termination of the original takeover attempt. Within the first year, 187 firms received a second offer (156 of which were successful). By the end of the fifth year more than half the sample received another offer and 278 (48 percent) of the sample firms were successfully taken over. Panel C reports the frequency of delisting of sample firms using CRSP criteria for delisting. These criteria include takeovers, liquidations, bankruptcy filings, insufficient capital, and other infrequent criteria, which are grouped into the Other Delisting category. The total number of Other Delisting is 47. The reasons for Other Delisting are as follows: no reason available (10), insufficient number of market makers (10), insufficient number of shareholders (2), the price fell below an acceptable level (3), upon company's request with no specific reason given (7), firms went private (4), delinquent in filing (5), and firms did not meet the exchange's financial guidelines for continued listing (6).⁵

B. Summary Statistics

Table II reports summary statistics for sample firms. The median leverage ratio, measured as the book value of total debt scaled by the book value of assets, increases from 0.598 in year -1 to 0.715 in year $+1$, after staying virtually constant for the five years prior to year -1 . Target leverage ratios are about the same as the leverage ratios of other firms in their industries in the five years before the takeover attempt. The increase in their leverage ratios in year $+1$ thus puts the target firms at leverage ratios substantially above their industry counterparts and they stay above their industry counterparts for at least five years after the termination of the takeover attempt.^{6,7}

⁵ According to CRSP, there are only eight cases in which targets filed for bankruptcy. Using Hotchkiss's (1995) sample, we find 21 cases.

⁶ It may be difficult to interpret the changes in debt and cash flows (later) in event time because the sample is changing (532 in year -1 , 396 in year 0, and 328 in year $+1$). For example, leverage ratios increase from year 0 to year $+1$. Two possibilities arise: (1) firms increase their leverage by an additional amount, or (2) firms that drop out between years 0 and $+1$ are those that have lower leverage ratios. Our findings support the second conjecture. Of the 68 firms that drop out between years 0 and $+1$ we find that 60 have a leverage ratio that is lower than the median leverage ratio in year 0. Given that the composition of our sample is changing from year to year, we compute the change in leverage after restricting our sample to the surviving targets as of year 5. We find that the median changes in leverage from year -1 to years $+1$, $+2$, $+3$ are 15.1 percent, 20.6 percent, and 16.7 percent, respectively. This com-

The observed increase in leverage ratios is due to a combination of factors. Some firms issued special dividends, a larger number repurchased shares, and a number of firms issued new debt. Table III shows that targets that increase their leverage above the median change generally return capital to their shareholders, reducing the book value of their equity by 37.54 percent on average. In Panel C, we report mean values for special dividends and share repurchases for the same group of targets. Over years 0 and +1, targets that increase leverage the most pay out about 5 percent of the market value of equity to their shareholders in the form of special dividends and they repurchase more than 11 percent of their shares. On the other hand, targets that increase their leverage the least show an economically insignificant change in special dividend and repurchases activities over the same period.

For each firm, annual industry-adjusted performance measures are calculated by subtracting from the target firm's change in performance the change in performance over the same period for the target firm's industry (which is defined by the company's two-digit SIC code). Industry data are collected from the COMPUSTAT Industrial, Tertiary, and Research data files.

Targets in the year prior to the failed takeover attempt have a median (mean) industry-adjusted cash flow to book value of -0.0015 (-0.0096). Industry-adjusted cash flow to sales has a median (mean) of -0.0034 (-0.0018). Both industry-adjusted cash flow to book value of assets and cash flow to sales, though negative, are not significantly different from zero. The median (mean) market-to-book ratio is 1.21 (1.61) in the year prior to the takeover attempt. Target firms have poor stock price performance in the year prior to the takeover attempt, starting 300 trading days and ending 21 trading days (one month) before the announcement of the takeover attempt. Over this period, the median (mean) of the target firms' holding period returns minus the holding period returns of the value-weighted index is a significant -4.76 percent (-4.08 percent). This evidence is consistent with prior studies that show that target firms are poor performers prior to the takeover attempt.

C. Management Turnover Following Failed Takeovers

Because we are interested in understanding how operating changes following unsuccessful takeover attempts relate to leverage changes, it is important to first examine whether leverage affects the probability of a

pires to a median change of 3.2 percent, 3.09 percent, and 4.48 percent, respectively, if we impose no restriction on sample firms.

⁷ To get further information about the timing of the leverage increase, we use the *Securities Data Corporation (SDC) Corporate Securities Offerings* database, which includes a listing of publicly and privately placed debt offerings. However, we were able to identify only 74 debt offerings out of 207 leverage increases by target firms. Of the 74 offerings, 14 occurred within six months before the initial announcement of the takeover attempt and 20 occurred between the announcement and the termination date. (The average time from announcement date to termination date is 76 days.) An additional 32 offerings occurred within the first six months after the termination of the takeover attempt. The remaining 8 were offered in the second six months after the termination date.

Table II
Summary Statistics for Sample Firms

Summary statistics are presented for targets of unsuccessful takeover attempts and transaction characteristics. The sample of unsuccessful takeovers during the 1982 to 1991 period is obtained from *Mergerstat Review*, published annually by *W.T. Grimm*. Reported are median, mean, standard deviation, and the number of observations of total debt scaled by the book value of assets, industry-adjusted cash flow to book value, industry-adjusted cash flow to sales, market-to-book, and holding period returns of targets minus the holding period returns of the CRSP value-weighted index over the year prior to the announcement of the takeover attempt. The year of the variable is indicated by a subscript: -1 is the year before the termination, 0 is the termination year, and $+1$ is the year following the termination. Panel B reports top management turnover following unsuccessful takeover attempts. The top manager is defined as the CEO if there is one and the president otherwise. Management changes are identified through comparisons in *Standard and Poor's Register of Corporations, Directors, and Executives*. Firms are classified based on whether the change (Δ) in leverage is higher or lower than the median change, and on whether the takeover attempt is hostile or friendly. The percentage of management changes is presented and a difference in means test is also reported.

Panel A: Summary Statistics				
Variable	Median	Mean	Std. Dev.	N
Total debt to book value of assets ₋₁	0.598	0.600	0.248	532
Total debt to book value of assets ₀	0.643	0.678	0.383	396
Total debt to book value of assets ₊₁	0.715	0.756	0.473	328
Total debt to market value of equity ₋₁	0.287	0.394	0.289	530
Total debt to market value of equity ₀	0.305	0.442	0.446	394
Total debt to market value of equity ₊₁	0.352	0.503	0.515	327
Cash flow to book value ₋₁	0.119	0.109	0.130	557
Cash flow to sales ₋₁	0.123	0.126	0.141	555
Industry-adjusted cash flow to book value ₋₁	-0.0015	-0.0096	0.093	557
Industry-adjusted cash flow to sales ₋₁	-0.0034	-0.0018	0.072	555
Market-to-book ₋₁	1.21	1.61	2.43	507
Target - CRSP value weighted index	-0.0476 (0.00)	-0.0408 (0.00)	0.3108	443
Panel B: Management Turnover				
Classification	Mean (%)	p-value	N	
All sample firms	32.42		524	
Bidder terminated	37.56		134	
Rejected by nonbidder	30.65	0.134	390	
Δ in total debt < median Δ	30.00		152	
Δ in total debt > median Δ	36.78	0.154	146	
Hostile takeover attempt	44.10		114	
Friendly takeover attempt	29.17	0.028	410	

management change. Panel B of Table II reports statistics on management turnover for our sample of companies that remain independent for at least one year. These statistics are based on data from *Standard and Poor's Register of Corporations, Directors, and Executives*. Management turnover reflects the change in the top executive of the firm, defined as the CEO if there is one and the president otherwise. We compare the CEO in year $+1$ to

Table III
Changes in Common Equity, Special Dividends, and Share Repurchases

This table reports changes in common equity, special dividends, and share repurchase of targets with an increase in leverage (measured as total debt scaled by the book value of assets) higher (lower) than the median change. Our sample consists of 573 targets of unsuccessful takeovers for the 1982–1991 period obtained from *Mergerstat Review*, published annually by *W.T. Grimm*. Panel A reports the frequency of percentage changes in common equity for targets with leverage changes higher (lower) than the median change. For example, the frequency reported in the table for the interval of $(-95\% < \Delta \leq -85\%)$ refers to the number of targets with percentage reduction in common equity greater than 95 percent and less than or equal to 85 percent. Panel B reports summary statistics for changes in total debt and percentage changes in common equity. Panel C reports mean values for special dividends and share repurchases for targets with leverage changes higher (lower) than the median change (Δ).

Panel A: Frequency of Percentage Changes in Common Equity		
	Percentage Changes in Book Value of Common Equity from Year -1 to Year +1	
	Δ in Leverage > Median Δ	Δ in Leverage < Median Δ
$-95\% < \Delta \leq -85\%$	15	0
$-85\% < \Delta \leq -75\%$	21	0
$-75\% < \Delta \leq -65\%$	13	1
$-65\% < \Delta \leq -55\%$	11	1
$-55\% < \Delta \leq -45\%$	10	3
$-45\% < \Delta \leq -35\%$	10	5
$-35\% < \Delta \leq -25\%$	10	5
$-25\% < \Delta \leq -15\%$	8	8
$-15\% < \Delta \leq -5\%$	10	11
$-5\% < \Delta < 0\%$	8	2
$\Delta = 0$	3	4
$0 < \Delta \leq 10\%$	6	19
$10\% < \Delta \leq 20\%$	4	22
$20\% < \Delta \leq 40\%$	6	24
$40\% < \Delta \leq 60\%$	3	6
$60\% < \Delta \leq 80\%$	2	9
$80\% < \Delta < 100\%$	2	5
$\Delta \geq 100\%$	0	14
Total	142	141

Panel B: Summary Statistics for Changes in Common Equity and Total Debt Ratio				
	Changes in Total Debt Ratio from Year -1 to Year +1		Percentage Changes in Book Value of Common Equity from Year -1 to Year +1	
	Δ in Debt > Median Δ	Δ in Debt < Median Δ	Δ in Debt > Median Δ	Δ in Debt < Median Δ
Mean	0.3299	-0.0969	-37.54%	29.06%
Median	0.1910	-0.0311	-43.71%	14.87%
Min	0.0362	-1.6596	-94.68%	-68.43%
Max	3.4531	0.0349	95.77%	296.20%
Panel C: Mean Values for Special Dividends and Share Repurchases				
	Subsample: Δ in Debt > Median Δ		Subsample: Δ in Debt < Median Δ	
	Levels in Year(s) i		Levels in Year(s) i	
	-1	0 and +1	-1	0 and +1
Special dividend	0.0207 ^a	0.0508 ^a	0.0223 ^a	0.0245 ^a
Share repurchase	0.0137 ^a	0.1129 ^a	0.0362 ^a	0.0327 ^a

^aEstimates are statistically different from zero at the 1 percent significance level.

the CEO in year -1 , where year 0 is the year of the unsuccessful takeover attempt. If the top executive's name is different then we assume that the firm has experienced turnover in the top management.

We document in Panel B of Table II a 32 percent turnover rate for the entire sample, which is much higher than the 17 percent average turnover rate reported by Denis and Denis (1995) in their study of 1,689 firms covered by the Value Line Investment Survey. In comparison, Denis and Serano (1996) document a 34 percent management turnover rate for their sample of failed takeovers, and Agrawal and Walkling (1994) document a 44 percent rate of turnover in the two years following a failed takeover bid in their study.

Management turnover rates are reported separately for failed targets that increase their leverage ratios either less or more than the median amount. For the first subsample (change (Δ) in leverage $<$ median Δ), 30 percent of the top managers were removed, compared to 36.78 percent for the second subsample. However, because the difference in these percentages is not statistically significant, we cannot conclude that leverage has an appreciable effect on management turnover. We also examine management turnover in the hostile and friendly subsamples. If the takeover attempt is hostile, 44.10 percent of top managers are replaced, whereas if the takeover attempt is friendly, only 29.17 percent are replaced. The difference in these percentages is significant at the 5 percent level.

D. Leverage as a Takeover Defense

As mentioned in the introduction, we believe that failed targets increased leverage to defend against unwanted takeover attempts. The observed difference in the change in leverage ratios between friendly and hostile takeovers is consistent with this belief. Table IV reports the percentage change in total debt scaled by the book value of assets for the two subsamples consisting of friendly and hostile takeovers. For the friendly takeover group the median percentage changes in the leverage ratio from one year prior, to one, two, and three years following the failed takeover attempt are 2.07, 2.45, and 4.09 percent, respectively. For the hostile group, the median total debt increases amount to 12.24, 8.97, and 7.59 percent over the same period.⁸ We

⁸ The total number of observations in the analysis differs from year to year because of data availability. For example, Table II reports that there are 532 targets with valid debt data in year -1 . Over the first 12 months following the termination of the failed takeover attempt 188 ($156 + 3 + 1 + 4 + 24$) firms were delisted as reported in Table I. Table IV reports 90 and 238 debt observations for the hostile and friendly group respectively. The difference between 532 and 188 is 344, and the sum of 90 and 238 is 328. In Table IV, year $+1$ denotes the end of the first fiscal year after the termination of the takeover attempt; it does not necessarily mean 12 months after the termination. For example, a takeover attempt was terminated in March, and the target firm has a December fiscal year end. We are measuring whether it was delisted on CRSP from March through February of the following year (12-months period; Panel C of Table I). In the analysis using COMPUSTAT data, year $+1$ means the end of the following fiscal year—that is, December, not February, of the following year.

Table IV
Changes in Total Debt Scaled by the Book Value of Assets

Summary statistics are presented for changes in total debt scaled by the book value of assets for hostile and the friendly takeover attempts five years following the termination year for the sample of 573 targets of unsuccessful takeovers for the 1982–1991 period, obtained from *Mergersstat Review*, published annually by W.T. Grimm. The median and mean percentage changes in book value of debt scaled by the book value of total assets are reported, as well as the number of firms with valid observations. Nonparametric significance levels for tests in difference in medians are based on the Mann–Whitney–Wilcoxon test.

	From Year <i>i</i> to Year <i>j</i>				
	–1 to +1	–1 to +2	–1 to +3	–1 to +4	–1 to +5
Hostile group					
Median	12.24%	8.97%	7.59%	7.23%	10.99%
Mean	19.84	18.91	16.12	18.64	20.60
<i>N</i>	90	81	73	66	56
Friendly group					
Median	2.07% ^a	2.45% ^a	4.09% ^a	4.33% ^a	4.41% ^a
Mean	11.15	11.74	11.64	12.31	11.98
<i>N</i>	238	219	185	156	116

^aMedian figures for the hostile and friendly groups are statistically different at the 1 percent significance level.

find that the difference between these percentage changes in each of the three years following the failed takeover attempt is statistically significant at the 1 percent level using the Mann–Whitney–Wilcoxon test.

Consistent with prior studies, it appears that the higher leverage does reduce the likelihood of targets getting taken over. For example, 38 percent of the target firms that increased their leverage ratio more than the median between years –1 and +1 were taken over in the five years following the initial failed takeover attempt. In contrast, 57 percent of those target firms that increased their leverage ratios less than the median were taken over within five years. The percentage of firms that remained independent after failed takeovers is substantially higher in our sample than it is in the sample examined by Bradley, Desai, and Kim (1983), which is for an earlier time period. Bradley et al. report that 77 percent (86 out of 112) of their sample were taken over after five years of the initial failed takeover attempt. In contrast, in our later sample only about 48 percent (278 out of 573) of the failed targets get taken over within five years. The increased percentage of firms that remain independent in the later period is probably due to the increased use of poison pills and other antitakeover defenses, antitakeover legislation, and, perhaps, the deterrent effect of higher leverage.

We expect that some target managers chose not to increase leverage because they were able to use other defensive mechanisms to deter acquisitions. To investigate this possibility we examined a wide variety of defensive tactics, which include stock lockup, white knight, white squire, greenmail,

pacman, scorched earth, and targeted repurchases. We compute the frequency of cases where targets have used a defensive tactic in the two groups: targets that increased leverage and targets that did not.

Our sample includes 121 cases where targets did not increase their leverage. About half (61) of these firms adopted a defensive tactic other than debt. In contrast, only 33 of the 207 firms that increased their leverage adopted a defensive tactic. A plausible interpretation is that financial restructuring and other defensive tactics are substitutes. For some firms, financial restructuring is the optimal defense, while others prefer different options.

II. Changes in Leverage and Investment Choices

Our main goal is to test the hypothesis that higher leverage commits failed targets to make changes that improve their operating performance and as a result increase their stock prices. To examine this we first look explicitly at the kinds of changes made by failed targets and then examine the extent to which these changes lead to operating improvements and higher stock prices.

As discussed in Myers (1977), higher leverage can have the effect of decreasing a firm's investment expenditures.⁹ Thus, as Jensen (1986) explains, if managers have a tendency to overinvest, higher leverage can have the effect of reducing their level of investment to what might approximate the value-maximizing level.

Although we are unable to determine whether target firms are overinvesting or underinvesting, we can document whether investment expenditures increase or decrease after the takeover attempts and can compare how these changes relate to changes in leverage. To investigate this issue we examine capital expenditures and research and development expenses for the seven years around the failed takeover attempts. Panel B of Table V indicates that the median (mean) level of capital expenditures scaled by the book value of assets of target firms that increase their leverage more than the median in year -1 is 0.067 (0.086),¹⁰ and is 0.048 (0.050) in year $+2$. The median (mean) percentage reduction of this ratio is a statistically significant 35.36 percent (12.16 percent) from one year prior to two years after the takeover attempt. Research and development expenditures show a similar decline for the leverage increasing targets, though the decline is not significant at conventional levels. Target firms that increase their leverage less than the median have an insignificant change in their capital and research and development expenditures.

The negative relation between the change in investment expenditures and the change in leverage is consistent with the Myers (1977) and Jensen (1986) models. The results, however, do not support the Ross (1977) signaling model, which suggests that managers who are the most optimistic about future

⁹ Lang, Ofek, and Stulz (1996) provide evidence suggesting that increased debt does induce firms to invest less, at least for firms with low Tobin's q ratio.

¹⁰ Results are qualitatively identical when we scale capital expenditures and research and development expense by sales rather than book value of assets.

productivity increase leverage. We would expect, holding all else equal, that those managers who are the most optimistic about future prospects will increase investment expenditures as well as increase leverage, but that is not what we observe.

III. Corporate Restructuring

The evidence presented above indicates that increases in leverage following failed takeovers are correlated with decreases in investment. This section examines whether leverage is related to other restructuring activities that are typically associated with takeovers. For example, Bhagat, Shleifer, and Vishny (1990) and Berger and Ofek (1998) document that successfully acquired firms usually undergo an extensive restructuring involving asset sales and layoffs. Berger and Ofek (1998), and Denis, Denis and Sarin (1997) argue that firms that implement corporate refocusing programs often do so in the presence of external control pressures such as takeover threats.

To examine whether leverage is related to these restructuring activities, we report in Panel E of Table V summary statistics for restructuring activity in our sample. The table shows that 45.4 percent of those targets that increase leverage more than the median have asset sales reported in the *Wall Street Journal* in the two years following the failed takeover. In contrast, only 16.5 percent of those targets that increase leverage less than the median have asset sales reported. Additionally, failed targets that increase leverage the most reduce their labor force by more than 5 percent, but those targets that increase leverage the least do not change employment significantly. Failed targets that increase leverage the most also increase their focus, as indicated by the change in the number of SIC codes that Dun and Bradstreet report the firm doing business in. On average, targets that increase leverage the least report that they do business in 0.156 *more* SIC codes following a failed takeover. In contrast, failed targets that increase leverage the most do business in 0.645 *fewer* SIC codes. These differences between the restructuring activities of firms that increase leverage more and less than the median amount are all statistically significant.

IV. Changes in Leverage and Operating Performance

A. Univariate Analysis of Firm Level Data

The previous section documented that failed targets that increase their leverage the most make a number of changes that can potentially improve their productivity. In this section we attempt to estimate these productivity changes by examining changes in the firms' pretax operating cash flows.¹¹

¹¹ This measure of operating performance is used in previous studies by Ravenscraft and Scherer (1987), Kaplan (1989), and Smith (1990). Pretax operating cash flow is measured as net sales, less cost of goods sold, less selling and administrative expenses, before deducting depreciation and amortization expense. We focus on pretax operating cash flows that are unaffected by changes in tax status or capital structure.

Table V
Corporate Restructuring for Targets with a Change in Leverage that is Lower (Higher)
than the Median Change

Summary statistics are given for capital expenditures scaled by the book value of assets, and research and development expense scaled by the book value of assets for seven years around the failed takeover attempt year, changes in the number of employees scaled by the book value of assets from one year before to one year after the failed takeover attempt year, changes in the number of SIC codes from one year before to five years after the failed takeover attempt year, and the frequency of assets sales in the two years after the failed takeover attempt year. Our sample includes 573 targets of unsuccessful takeovers during the 1982–1991 period obtained from *Mergerstat Review*, published by *W.T. Grimm*. Panel A reports the median, mean, and standard deviation of capital expenditures, and research and development expense for targets with a change (Δ) in total debt that is less than the median change (Δ). Panel B reports the same statistics for targets with a change in total debt that is greater than the median change (Δ). Percentage changes in capital expenditures scaled by the book value of assets and in research and development expense scaled by the book value of assets for various intervals are reported in Panels C and D. Panel E reports the mean values and the p -values for the difference in means t -test.

	Year −3	Year −2	Year −1	Year 0	Year +1	Year +2	Year +3
Panel A: Change in Leverage Lower than the Median Change							
Capital expenditures scaled by the book value of assets							
Median	0.066	0.064	0.063	0.056	0.056	0.052	0.057
Mean	0.117	0.106	0.092	0.077	0.080	0.079	0.086
Std. dev.	0.143	0.116	0.084	0.075	0.080	0.092	0.097
<i>N</i>	148	153	152	164	145	122	100
Research and development expense scaled by the book value of assets							
Median	0.039	0.044	0.044	0.050	0.054	0.056	0.047
Mean	0.018	0.024	0.024	0.023	0.024	0.025	0.019
Std. dev.	0.044	0.056	0.052	0.073	0.093	0.077	0.090
<i>N</i>	59	58	57	58	54	44	38
Panel B: Change in Leverage Higher than the Median Change							
Capital expenditures scaled by the book value of assets							
Median	0.064	0.067	0.067	0.058	0.052	0.048	0.049
Mean	0.086	0.085	0.086	0.081	0.078	0.050	0.056
Std. dev.	0.083	0.066	0.077	0.080	0.073	0.051	0.043
<i>N</i>	156	164	169	171	168	159	133
Research and development expense scaled by the book value of assets							
Median	0.010	0.011	0.011	0.008	0.007	0.007	0.010
Mean	0.029	0.032	0.027	0.026	0.022	0.028	0.032
Std. dev.	0.047	0.083	0.055	0.034	0.031	0.048	0.058
<i>N</i>	77	82	82	76	79	73	62

	Δ in Debt < Median Δ			Δ in Debt > Median Δ		
	-1 to +1	-1 to +2	-1 to +3	-1 to +1	-1 to +2	-1 to +3
Panel C: Percentage Change in Capital Expenditures from Year i to Year j						
Median	-7.93%	-9.22%	-10.11%	-17.62% ^b	-35.36%***	-27.93%***
Mean	6.91	29.62	14.52	-13.23*	-12.16	-2.87
Percent positive	44	44	43	39	30	33
Std. errors	0.77	2.71	1.04	0.58	0.93	0.87
N	143	119	97	166	158	132
Panel D: Percentage Change in Research and Development from Year i to Year j						
Median	-1.39%	9.38%	11.51%	-8.88%*	-11.84%	-8.82%
Mean	19.04*	54.52**	91.84	-9.50*	9.09	13.79
Percent positive	48	57	63	38	39	45
Std. errors	0.67	1.33	3.04	0.42	0.98	1.14
N	44	35	27	61	56	47
Panel E: Various Characteristics Scaled by the Book Value of Assets (reported values are means)						
Characteristic	Δ in Debt < Median Δ		Δ in Debt > Median Δ		t -test (p -values)	
Asset sales in the two years following the initial failed takeover attempt	16.5%***		45.4%***		0.000	
Δ in the number of SIC codes from year -1 to +5	0.156		-0.645***		0.002	
Percentage Δ in the number of employees from year -1 to +1	-1.09%		-5.67%**		0.026	

*, **, *** Statistically different from zero at the 10, 5, and 1 percent significance levels, respectively.

Cash flow is scaled by book value of assets, as well as sales and the market value of the firm in year -1 , to allow comparison across firms and through time.

Target firm operating performance is measured relative to the performance of equally weighted portfolios of control firms constructed for each target firm using a procedure based on the methodology suggested by Barber and Lyon (1996). These control firms are selected from firms listed on COMPUSTAT which have not been subject to a takeover attempt (whether successful or not) during the prior five years. The control portfolio is constructed with the following three-step algorithm:

1. Each target firm is matched to all nontargets in the same two-digit SIC code.
2. To match on size, potential control firms with book values that are not within 70 to 130 percent of the target's book value of assets in the year prior to the takeover attempt are eliminated.
3. To match on prior performance, potential control firms that are not within 90 to 110 percent of the target firm's ratio of cash flow to book value of assets in the year prior to the takeover attempt are eliminated.

If no firm matches on SIC code, size, and prior performance, the firm with the best prior performance with the same SIC code and size is selected as the control portfolio. If this algorithm results in either no matching firms or missing data, an alternative rule is followed. First, we repeat the original algorithm using a one-digit SIC code screen. If we still have no match we eliminate the SIC code screen.

All sample firms are matched using either the original algorithm or the alternative rules. Target abnormal operating performance is then estimated by subtracting from its operating performance the performance of the control portfolio (henceforth, matched-adjusted performance). We report the matched-adjusted percentage change in these cash flows which is calculated as follows:

$$CFBV_j - CFBV_i[CFBV_i] - \left[\frac{AVG(CFBV)_j - AVG(CFBV)_i}{|AVG(CFBV)_i|} \right], \quad (1)$$

where $CFBV_j$ is the cash flow to book value in year j , and $AVG(CFBV)_i$ is the equally weighted average of the cash flow to book value of assets of the matching firms in year i . Raw changes rather than percentage changes give qualitatively identical results.

We use this methodology to choose the control portfolio and measure abnormal operating performance for several reasons. First, a matching portfolio controls for economy-wide and industry-wide effects on target performance. Second, matching on operating performance controls for potential mean reversion in earnings and other operating ratios that have been documented in prior

studies (Fama and French (1995) or Penman (1991)). Barber and Lyon (1996) conclude that tests using control firms not matched on performance are misspecified when the event firms have particularly good or poor prior operating performance.

By looking at cash flows over a five-year period, we can capture both long- and short-run effects of the debt changes. It is important to examine cash flows over a long time period because increased debt can make firms more shortsighted in their operating and investment decisions, making immediate cash flows higher at the expense of later cash flows. For example, Maksimovic and Titman (1991) argue that debt may distort a firm's incentive to offer high quality products, boosting short-run profits by cutting costs at the expense of its long-term reputation and profits. Further, managers may have incentives to manipulate their earnings following a failed takeover attempt and these incentives may differ depending on the firm's leverage ratio. If reported operating income increases because of either shortsighted incentives or manipulated accounting numbers, reported operating income should initially increase but later decline.

Since cash flow measures are skewed, we present results for medians rather than means and report significance levels based on a two-tailed sign test. The null hypothesis is that post-termination cash flows equal pre-termination cash flows. In order to examine the relation between leverage and performance, we split the sample into two groups based on the median change in leverage between year -1 and year $+1$.

Table VI documents that those target firms that increase their leverage the least realize reductions in their adjusted operating cash flows and those that increase their leverage the most realize increases in their adjusted cash flows. Specifically, Panel A shows that for those targets that increase debt less than the median change, cash flows significantly decline relative to the year prior to the termination of the takeover attempt. The adjusted percentage change in cash flow/book value of assets relative to year -1 has a median of -10.25 , -23.04 , and -19.18 percent in each of years 3, 4, and 5 following the failed attempt. When cash flows are scaled by sales or by market value in year -1 , the results are qualitatively similar. Panel B reports the same operating performance measures for targets where the change in total debt is higher than the median change. The adjusted percentage change in cash flow scaled by market value in year -1 increases by 20.16 , 19.79 , and 18.23 percent in the years 3, 4, and 5 following the failed takeover attempt.

A potential bias in the results reported in Panels A and B would arise if firms with the poorest performance were subsequently taken over and were dropped from our sample. If this were the case, aggregate cash flows would show improvement even if individual firms did not improve. To examine whether the improvements in operating profits reported in Table VI are due to poorly performing targets dropping out of the sample (about 40 percent drop out after five years), we separately examine the performance of those firms that survived through year 5. These results are reported in Panels C,

Table VI
Changes in Operating Performance

Median matched-adjusted percentage changes are reported for cash flow to book value and cash flow to sales around the failed takeover attempt year for the sample of 573 targets of unsuccessful takeovers over the 1982 to 1991 period, obtained from *Mergerstat Review*, published by *W.T. Grimm*. The cash flow to book value and cash flow to sales in year -1 is taken as the benchmark year. Matched-adjusted percentage change is calculated as follows:

$$\text{CFBV}_j - \text{CFBV}_i | \text{CFBV}_i | - \left[\frac{\text{AVG}(\text{CFBV})_j - \text{AVG}(\text{CFBV})_i}{|\text{AVG}(\text{CFBV})_i|} \right],$$

where CFBV_j is the cash flow to book value in year j , and $\text{AVG}(\text{CFBV})_i$ is the equally weighted average of the cash flow to book value of assets of the matching firms in year i . Also reported are the percentage change in cash flow scaled by the market value of the firm in year -1 . Significance levels are based on a two-tailed sign test, reported in parentheses. Panel A reports the median matched-adjusted percentage change in cash flow to book value, cash flow to sales, and cash flow to market value for targets with a change in total debt that is less than the median change. Panel B reports the same statistics for targets with a change in total debt that is greater than the median change. Panel C reports the same statistics for the overall sample that survived through year 5. Panels D and E report the same statistics for targets that survived through year 5 with changes in leverage lower (higher) than the median change respectively.

	From Year i to Year j				
	-1 to $+1$	-1 to $+2$	-1 to $+3$	-1 to $+4$	-1 to $+5$
Panel A: Change in Leverage Less than the Median Change					
Matched-adjusted percentage change in cash flow to book value	−6.09% (0.234)	−8.22% (0.126)	−10.25% (0.109)	−23.04% (0.033)	−19.18% (0.028)
Matched-adjusted percentage change in cash flow to sales	−4.78% (0.313)	−11.24% (0.117)	−12.05% (0.097)	−18.69% (0.041)	−21.70% (0.015)
Percentage change in cash flow scaled by the market value in year -1	−9.19% (0.147)	−14.77% (0.071)	−20.65% (0.052)	−16.56% (0.039)	−22.58% (0.026)
N	144	139	120	96	70
Panel B: Change in Leverage Greater than the Median Change					
Matched-adjusted percentage change in cash flow to book value	5.81% (0.554)	9.83% (0.188)	12.19% (0.095)	14.56% (0.077)	13.56% (0.061)
Matched-adjusted percentage change in cash flow to sales	9.61% (0.180)	11.58% (0.126)	19.12% (0.029)	16.42% (0.040)	18.99% (0.028)
Percentage change in cash flow scaled by the market value in year -1	6.29% (0.310)	12.57% (0.101)	20.16% (0.012)	19.79% (0.024)	18.23% (0.031)
N	160	152	129	112	100

Panel C: Overall Sample that Survived through Year 5					
Matched-adjusted percentage change in cash flow to book value	1.12%	6.11%	0.52%	1.87%	3.13%
	(0.542)	(0.294)	(0.879)	(0.759)	(0.432)
Matched-adjusted percentage change in cash flow to sales	4.16%	2.15%	3.92%	7.76%	3.51%
	(0.341)	(0.429)	(0.246)	(0.421)	(0.319)
Percentage change in cash flow scaled by the market value in year -1	1.33%	3.99%	1.78%	5.11%	7.61%
	(0.634)	(0.312)	(0.546)	(0.308)	(0.193)
<i>N</i>	170	170	170	170	170
Panel D: Change (Δ) in Leverage Less than Median Δ Conditional on Surviving through Year 5					
Matched-adjusted percentage change in cash flow to book value	-4.36%	-7.17%	-15.71%	-25.19%	-19.18%
	(0.233)	(0.325)	(0.051)	(0.024)	(0.028)
Matched-adjusted percentage change in cash flow to sales	-5.16%	-10.56%	-12.52%	-17.18%	-21.70%
	(0.239)	(0.191)	(0.068)	(0.032)	(0.015)
Percentage change in cash flow scaled by the market value in year -1	-6.77%	-9.96%	-19.98%	-20.15%	-22.58%
	(0.294)	(0.373)	(0.015)	(0.034)	(0.026)
<i>N</i>	70	70	70	70	70
Panel E: Change (Δ) in Leverage Greater than Median Δ Conditional on Surviving through Year 5					
Matched-adjusted percentage change in cash flow to book value	5.08%	12.26%	13.78%	16.13%	13.56%
	(0.172)	(0.106)	(0.086)	(0.040)	(0.061)
Matched-adjusted percentage change in cash flow to sales	8.15%	14.59%	19.98%	20.41%	18.99%
	(0.179)	(0.088)	(0.024)	(0.011)	(0.028)
Percentage change in cash flow scaled by the market value in year -1	4.19%	12.11%	19.55%	23.65%	18.23%
	(0.356)	(0.074)	(0.031)	(0.009)	(0.031)
<i>N</i>	100	100	100	100	100

D, and E. Consistent with Panel B, leverage-increasing firms that survive through year 5 experience significant improvements in operating cash flows. The similarity between the cash flow improvements in the samples with and without the survival requirement suggests that the cash flow improvements for firms that were and were not subsequently taken over were not significantly different.

B. Univariate Analysis of the Targets' Largest Segments

The evidence in the preceding subsection is consistent with the idea that leverage induces managers to expend additional effort that improves their firms' cash flows. The evidence, however, is also consistent with the possibility that the more highly levered firms sell off underperforming assets, perhaps in an attempt to focus on their more profitable lines of business. To investigate whether the improvement in cash flow is solely due to the elimination of unprofitable lines of business we replicate the tests reported in the last subsection on the cash flows of the firms' largest segments as reported in the COMPUSTAT segment data. This analysis assumes that it is much less likely that firms benefit from selling off underperforming assets within their core segments, so improvements in cash flows within these segments is likely to be due to the elimination of unproductive activities.

Our analysis of the individual segments indicates that there are operating improvements that are independent of the asset sales. In particular, targets that increase their leverage ratio more than the median amount experience an improvement in the operating cash flows of their largest segment. The industry-adjusted percentage change in cash flow/book value of assets relative to year -1 , reported in Panel B of Table VII, has a median of 11.01, 15.34, and 16.57 percent in each of years 3, 4, and 5 following the failed attempt. Unadjusted cash flows scaled by the book value of the segment have a similar pattern. On the other hand, targets that increase their leverage ratios less than the median have an insignificant median change in the operating cash flows of their largest segments.

C. Multivariate Analysis

Up to this point we have established that leverage increases are associated with asset sales, reductions in capital expenditures, increased focus, and reductions in employment. We have also established that leverage increases are associated with improvements in cash flows. It is likely that some of the observed increase in cash flows is due to cuts in unprofitable investment, sales of underperforming assets, and reductions in employment. However, our analysis of the cash flows of the firms' largest segments indicates that there are improvements in cash flows that come about because of unobserved incentive improvements that are also associated with increased leverage. To investigate this possibility further, we estimate multivariate regressions that examine the effect of leverage changes on cash flow changes after controlling for these and other factors.

Table VII
Changes in Operating Performance for Largest Segment of Targets
with a Change in Leverage that is Lower (Higher) than the Median Change

This table reports median change, median industry-adjusted change, and median industry-adjusted percentage change for the biggest segment (in assets as of year -1) in cash flow to book value around the failed takeover attempt year for the sample of 573 targets of unsuccessful takeovers over the 1982–1991 period, obtained from *Mergerstat Review*, published by *W.T. Grimm*. The cash flow to book value in year -1 is taken as the benchmark year. Industry-adjusted cash flow to book value measures are calculated by subtracting from the target's largest segment change in cash flow to book value the change in cash flow to book value over the same period for the target largest segment's industry (defined by the segment's two-digit SIC code). Industry data are collected from the COMPUSTAT Industrial, Tertiary, and Research data files. Significance levels are based on a two-tailed sign test, reported in parentheses. Panel A reports the median change, median percentage change, and industry-adjusted percentage change in cash flow to book value for targets with a change in total debt that is less than the median change. Panel B reports the same statistics for targets with a change in total debt that is greater than the median change.

	From year i to year j				
	-1 to $+1$	-1 to $+2$	-1 to $+3$	-1 to $+4$	-1 to $+5$
Panel A: Change in Leverage Less than the Median Change					
Change in cash flow to book value	−0.0017 (0.936)	−0.0094 (0.165)	−0.0169 (0.179)	−0.0203 (0.047)	−0.0206 (0.033)
Industry-adjusted change in cash flow to book value	0.0012 (0.921)	−0.0039 (0.862)	−0.0101 (0.566)	−0.0200 (0.034)	−0.0233 (0.059)
Industry-adjusted percentage change in cash flow to book value	7.91% (0.298)	−2.99% (0.972)	−0.36% (0.741)	−12.77% (0.151)	−14.60% (0.103)
N	142	133	109	92	64
Panel B: Change in Leverage Greater than the Median Change					
Change in cash flow to book value	0.0022 (0.665)	0.0071 (0.372)	0.0115 (0.072)	0.0195 (0.003)	0.0161 (0.006)
Industry-adjusted change in cash flow to book value	0.0131 (0.054)	0.0215 (0.021)	0.0248 (0.001)	0.0240 (0.002)	0.0377 (0.001)
Industry-adjusted percentage change in cash flow to book value	1.19% (0.938)	4.81% (0.233)	11.01% (0.029)	15.34% (0.014)	16.57% (0.011)
N	158	153	128	110	96

In addition to the leverage change, the independent variables in these regressions include the following:

- a dummy variable for CEO turnover, taking the value of 1 if the CEO in year +1 is different from the CEO in year -1, and 0 otherwise
- a dummy variable taking the value of 1 if the company reports the sale of an asset in the year of or the year after the failed takeover attempt and 0 otherwise
- the change in the number of SIC codes from one year before to five years following the takeover attempt
- the percentage change in the level of employment
- a dummy variable for whether the takeover attempt was terminated by the bidder or the target
- a dummy variable for whether or not the takeover attempt was hostile
- the level of insider ownership scaled by the number of shares outstanding. Insider ownership is defined as the total direct ownership obtained from *Spectrum 6 Insider Holdings*.¹²

We expect that performance is likely to improve the most for those targets with new managers and for those offers that were hostile. Furthermore, following Dodd (1980), we hypothesize that bidder-terminated takeover offers reveal more negative information about the target firm than other terminated offers.¹³

The results of these cross-sectional regressions, reported in Tables VIII and IX, indicate that the change in leverage has a significant effect on cash flows even after accounting for the other variables. This is especially true when we examine long-run changes in cash flow (e.g., from year -1 to year +5), where the effect of the leverage change on cash flows is quite strong. With the exception of CEO turnover, consistent with Denis and Serrano's (1996) observation that cash flows improve more for firms that get new CEOs, the control variables have virtually no marginal explanatory power in the long-term regressions. Perhaps this is because changes in employment, asset sales, and the scaling back in employment is a mixed signal;

¹² All results are robust to alternative specifications of the ownership variable. One alternative specification that we examine is the piecewise regression by Morck, Shleifer, and Vishny (1988).

¹³ Asquith (1983) analyzes the abnormal stock price performance of firms that engage in merger bids. He documents a -6.40 percent return for unsuccessful target firms on the termination date and interprets this finding to indicate that termination of the merger attempt conveys negative information. We measure the cumulative prediction errors (CPEs) for the termination period using the market model over a seven-day window (-5,1). We estimate the beta of the firm using 100 trading days of data (day -199 to -99 relative to the announcement of the transaction) and use the CRSP value-weighted index as the market index. When the bidder terminates the transaction, the CPEs are -8.42 percent compared to -3.14 percent for other-rejected transactions (not reported). The difference in the means is statistically significant using parametric and nonparametric tests at the 1 percent level.

Table VIII
Multivariate Analysis for Matched Adjusted Ratio
of Cash Flows to Sales

Estimates are given of cross-sectional ordinary least squares regressions relating changes in operating performance to firm variables for 573 target firms in unsuccessful takeovers for the 1982–1991 period. The dependent variables are the change from year i to year j in matched adjusted ratio of cash flow to sales. Leverage is measured as the book value of total debt scaled by the book value of total assets. Δ in leverage is measured between one year prior to the failed takeover attempt and one year afterward. Asset sales is a dummy variable taking the value of 1 if an asset sale occurred in the year of or the year after the failed takeover attempt and 0 otherwise. Change in the number of SIC codes is measured from one year before to five years following the takeover attempt. CEO turnover is a dummy variable taking the value of 1 for a change in the top management from year -1 to $+1$ and 0 otherwise. The percentage change in the number of employees and in capital expenditures is measured from one year before to two years after the failed takeover attempt. Hostile bid is a dummy variable taking the value of 1 for hostile takeovers and 0 otherwise. Insider ownership represents the level of insider ownership scaled by the number of shares outstanding. Bidder terminated is a dummy variable taking the value of 1 for non-bidder terminated takeover attempts and 0 for bidder terminated transactions. (t -statistics are in parentheses).

	Dependent Variable: Change from Year i to Year j in Matched Adjusted Ratio of Cash Flow to Sales			
	-1 to $+2$	-1 to $+3$	-1 to $+4$	-1 to $+5$
Intercept	−0.0784 (−3.26)***	−0.0967 (−3.59)***	−0.1498 (−4.16)***	−0.1738 (−4.08)***
Δ in leverage	0.0786 (1.88)*	0.0897 (1.91)*	0.1432 (2.31)**	0.1838 (2.61)**
Asset sales	0.0581 (3.04)***	0.0440 (2.04)**	0.0075 (0.25)	0.0280 (0.82)
Δ in number of SIC codes	0.0003 (0.06)	−0.0005 (−0.09)	−0.0023 (−0.29)	−0.0012 (−0.13)
CEO turnover	0.0145 (0.80)	0.0463 (2.25)**	0.0884 (3.24)***	0.0952 (3.12)***
% Δ in number of employees	0.0418 (1.54)	0.0118 (0.38)	−0.0129 (−0.31)	0.0074 (0.16)
% Δ in capital expenditures	−0.0159 (−0.87)	−0.0220 (−1.06)	−0.0466 (−1.79)*	−0.0441 (−1.46)
Hostile bid	0.0412 (1.80)*	0.0391 (1.52)	0.0451 (1.44)	0.0508 (1.48)
Insider ownership	−0.0285 (−0.82)	−0.0623 (−1.59)	−0.0368 (−0.70)	0.0090 (0.15)
Bidder terminated	0.0068 (1.11)	0.0083 (1.21)	0.0137 (1.52)	0.0135 (1.23)
N	123	121	103	84
Adjusted R^2	0.1466	0.1451	0.1638	0.1808
F	3.39***	3.32***	3.29***	3.11***

*, **, *** Statistically different from zero at the 10, 5, and 1 percent significance levels, respectively.

Table IX
Multivariate Analysis for Matched Adjusted Ratio
of Cash Flow to Book Value of Assets

Estimates are given of cross-sectional regressions relating changes in operating performance to firm variables for 573 target firms in unsuccessful takeovers for the 1982–1991 period. The dependent variables are the change from year i to year j in the matched adjusted ratio of cash flow to book value of assets. Leverage is measured as the book value of total debt scaled by the book value of total assets. Δ in leverage is measured between one year prior to the failed takeover attempt and one year afterward. Asset sales is a dummy variable taking the value of 1 if an asset sale occurred in the year of or the year after the failed takeover attempt and 0 otherwise. Δ in number of SIC codes is measured from one year before to five years following the takeover attempt. CEO turnover is a dummy variable taking the value of 1 for a change in the top management from year -1 to $+1$ and 0 otherwise. The $\% \Delta$ in the number of employees and in capital expenditures is measured from one year before to two years after the failed takeover attempt. Hostile bid is a dummy variable taking the value of 1 for hostile takeovers and 0 otherwise. Insider-ownership represents the level of insider ownership scaled by the number shares outstanding. Bidder terminated is a dummy variable taking the value of 1 for non-bidder terminated takeover attempts and 0 for bidder-terminated transactions. (t -statistics are in parentheses).

	Dependent Variable: Change from Year i to Year j in Matched Adjusted Cash Flow to Book Value of Assets			
	–1 to +2	–1 to +3	–1 to +4	–1 to +5
Intercept	–0.0668 (–3.05)***	–0.0741 (–3.03)***	–0.1079 (–3.53)***	–0.1173 (–3.29)***
Δ in leverage	0.0701 (1.69)*	0.0861 (2.02)**	0.1298 (2.49)**	0.1541 (2.69)***
Asset sales	0.0576 (3.35)***	0.0385 (1.99)**	0.0026 (0.11)	0.0231 (0.83)
Δ in number of SIC codes	0.0012 (0.25)	–0.0057 (–1.11)	–0.0124 (–1.81)*	–0.0144 (–1.85)*
CEO turnover	0.0124 (0.76)	0.0417 (2.27)**	0.0706 (3.07)***	0.0698 (2.76)***
$\% \Delta$ in number of employees	0.0291 (1.15)	0.0179 (0.63)	0.0071 (0.19)	0.0295 (0.75)
$\% \Delta$ in capital expenditures	–0.0076 (–0.46)	–0.0224 (–1.21)	–0.0445 (–2.04)**	–0.0401 (–1.62)
Hostile bid	0.0283 (1.80)*	0.0219 (0.95)	0.0230 (0.88)	0.0224 (0.79)
Insider ownership	–0.0347 (–1.11)	–0.0615 (–1.76)*	–0.0365 (0.83)	–0.0001 (–0.01)
Bidder terminated	0.0043 (0.78)	0.0040 (0.65)	0.0075 (1.01)	0.0058 (0.64)
N	124	122	104	85
Adjusted R^2	0.1484	0.1527	0.1910	0.2231
F	3.40***	3.44***	3.74***	3.71***

*, **, *** Statistically different from zero at the 10, 5, and 1 percent significance levels, respectively.

firms benefit from cutting back waste, but they are less likely to take these actions if they believe that their businesses are improving. Leverage increases, on the other hand, simultaneously signal that managers have the intention of cutting waste and are optimistic about the firm's prospects.¹⁴

V. Are the Positive Effects of Leverage Anticipated?

To examine whether investors anticipate the effect of leverage on performance we examine the stock returns of the failed targets in the period around the termination date as well as the longer period between the initial announcement of the proposed takeover and the termination date. As mentioned in the introduction, target stock prices drop on the termination announcement. However, consistent with earlier studies by Bradley (1980) and Dodd (1980), the target stock prices do not fall to the levels observed prior to the initial takeover announcement.

Our evidence indicates that target stock prices fall significantly less on the termination announcement for those firms that increase leverage more than the median, suggesting that investors at least partially anticipate the leverage increase as well as the positive effects of leverage on performance.¹⁵ Specifically, targets that increase leverage more than the median have mean cumulative prediction errors of -2.7 percent from 5 days before the termination announcement until 1 day after the termination day. This compares to -7.8 percent for targets that increase leverage less than the median. The difference between the two means is significant at conventional levels. Furthermore, target firms that increase leverage more than the median have a mean (median) CPE during the announcement-termination period of 13.2 percent (11.5 percent), which is significantly higher than the 6.1 percent (5.6 percent) return of target firms that increase leverage less than the median.

To test whether other factors that are correlated with the leverage change also influence stock returns over this time period, we run a series of multivariate regressions, which are reported in Table X. In the univariate regression, Model 1, the coefficient of the change in leverage is positive and significant. In Models 2 through 5, which control for whether there was a change in the top management, whether or not the offer was terminated by the bidder, whether the takeover attempt was hostile or not, and whether a subsequent offer was made, the coefficient of the leverage change is still significantly positive.

¹⁴ We replicate Tables VIII and IX with the difference in buy-and-hold returns between the targets and their matching benchmarks from the termination month to the earlier of five years or the delisting date as the dependent variable. Consistent with Tables VIII and IX, we find leverage and management turnover to be the only variables with significant coefficients.

¹⁵ Most of the large debt offerings take place following the termination announcement. However, targets sometimes make statements like "negotiating with our bank to extend a credit line" or the new restructuring plan includes "raising a certain amount of short-term debt prior to the termination."

Table X
Relation between Cumulative Prediction Errors during the Announcement-Termination Period and Change in Leverage

The relation between cumulative prediction errors during the announcement-termination period and change in leverage is examined. The dependent variable is the cumulative prediction errors during the announcement-termination period. It is calculated over five days before the announcement and five days after termination of the takeover attempt. Tests are conducted for a sample of 300 different firms with valid leverage data on COMPUSTAT. Leverage is measured as the book value of total debt scaled by the book value of total assets. Δ in leverage is measured between one year prior to the failed takeover attempt and one year afterward. CEO turnover is a dummy variable taking the value of 1 for a change in the top management and 0 otherwise. Bidder terminated is a dummy variable taking the value of 1 for non-bidder terminated takeover attempts and 0 for bidder terminated transactions. Hostile bid is a dummy variable taking the value of 1 for hostile takeovers and 0 otherwise. Subsequent is a dummy variable taking the value of 1 if the target firm receives a subsequent offer in the following five years, and 0 otherwise. The t -statistics in parentheses are based on the White adjusted standard errors.

	Dependent Variable: Cumulative Prediction Errors during the Announcement-Termination Period				
	(1)	(2)	(3)	(4)	(5)
Intercept	0.0129 (0.62)	-0.0053 (-0.22)	0.0913 (2.35)**	-0.0060 (-0.25)	0.0822 (1.34)
Δ in leverage	0.2036 (2.13)**	0.2106 (2.07)**	0.2207 (2.39)**	0.1977 (2.01)**	0.2156 (2.09)**
CEO turnover		0.0419 (0.92)			-0.0216 (-0.57)
Bidder terminated			-0.0330 (-2.47)**		-0.0395 (-2.53)**
Hostile bid					0.0166 (1.71)*
Subsequent				0.0774 (1.65)*	0.1012 (1.62)*
F	4.547**	2.844*	5.556***	3.878**	3.942**
N	300	265	296	300	265
Adjusted R^2	0.0117	0.0137	0.0299	0.0212	0.0425

*, **, *** Statistically different from zero at the 10, 5, and 1 percent significance levels, respectively.

VI. Leverage and Post-Termination Stock Price Performance

This section examines the long-run stock price performance of firms following the termination of takeover offers. We have two motivations for examining these long-run returns. First, we are interested in looking in more detail at whether the improvements described in previous sections translate into gains to shareholders. Our event study evidence suggests that at the time of the termination announcement, the terminated targets that increase

leverage the most suffer lower losses. However, there have been a number of studies that suggest that stock prices often underreact when new information is announced.¹⁶ Moreover, since the differences in stock returns between the two samples are small relative to the improvements subsequently realized by the firms that increase leverage the most, we have reasons to suspect that the stock price reaction on the termination announcement does not fully anticipate these improvements.

Our second motivation has to do with the question raised in the introduction regarding whether a target's management is acting in the shareholders' interests by turning down a takeover offer. In most cases, the immediate stock price reaction to the termination suggests that investors do not believe that the managers of terminated targets are acting in the shareholders' interests. However, a complete evaluation of the managers' choices requires an analysis of the long-term consequences of their decisions.

A. Long-Run Performance

In order to examine the long-run stock price performance of target firms we follow each firm from the termination month until the earliest of the delisting month, the termination's fifth anniversary month, or December 1994. For every target, the buy-and-hold return is calculated over 60 months, starting from the termination month of the takeover attempt to the closing price five years afterward. If a target firm is delisted prior to its anniversary month, we truncate its total return on that month. Thus the percentage buy-and-hold return for firm i is

$$R_{iT} = \left[\prod_{t=+1}^{\min[T, delist]} (1 + r_{it}) + 1 \right] \times 100\%, \quad (2)$$

where $+1$ stands for one month after the termination month of the takeover attempt; $\min[T, delist]$ is the earliest of the last month of CRSP-listed trading, the end of the five-year window, or December 1994; and r_{it} is the return for firm i on month t .

For the purpose of comparison, each target firm is matched with a benchmark portfolio consisting of stocks in the same size quintile, the same book-to-market quintile, and the same momentum quintile as the target in the year before the event.¹⁷ The composition of this portfolio is updated yearly to reflect changes in the target's characteristics. However, because we are simply rolling over the returns from this strategy without adding or subtracting money from the benchmark, over time the values of the benchmark and the target will diverge as their cumulative returns diverge.

¹⁶ See for example, Loughran and Ritter (1995), Lakonishok and Vermaelen (1990), Ikenberry, Lakonishok, and Vermaelen (1995), and Michaely, Thaler, and Womack (1995).

¹⁷ These are the benchmark portfolios used by Daniel et al. (1997) to evaluate mutual funds.

Table XI
Holding Period Returns for Targets and their Matching Firms
during the Five Years Following Termination
of the Failed Takeover Attempt

Holding-period returns (HPRs) are reported for 437 target firms in unsuccessful takeover attempts for the 1982–1991 period, obtained from *Mergerstat Review*, published by W.T. Grimm. HPRs are computed using the CRSP-listed closing price as the purchase price. The difference in holding period returns is calculated as $\Sigma_i(1 + R_{it}) - \Sigma_j(1 + R_{jt})$, where R_{it} is the holding period return starting the month after the termination month of the takeover attempt until the earlier of the delisting date or the five-year anniversary of the takeover attempt, R_{jt} is the holding period return on a matching firm. Each target firm is matched with a characteristic benchmarks portfolio of the same size quintile, the same book-to-market quintile, and the same momentum quintile in the year prior to the event. Percent negative is the percentage of negative returns.

	First Quartile	Median	Mean	Third Quartile	Percent Negative
Panel A: All Target Firms ($N = 437$)					
Target firms	–5.83%	22.82%	38.18%	73.87%	
Matching firms	6.94	29.05	35.85	54.26	
Target matching	–35.96	0.64	2.33	37.89	49%
Panel B: Target Firms with a Change in Debt Less than the Median Change ($N = 121$)					
Target firms	36.13%	4.31%	21.94%	71.08%	
Matching firms	6.82	29.09	36.11	51.87	
Target-matching	–69.15	–24.07	–14.16	38.36	64%
Panel C: Target Firms with a Change in Debt Greater than the Median Change ($N = 119$)					
Target firms	13.95%	44.06%	54.69%	73.90%	
Matching firms	7.07	31.04	35.58	55.47	
Target-matching	–8.42	13.72	19.10	37.69	34%

Panel A of Table XI reports the post-termination buy-and-hold long-run returns for the sample of target firms. For the entire sample these buy-and-hold returns have a mean (median) of 38.18 percent (22.82 percent), which should be compared to the long-run buy-and-hold returns for their matching benchmarks, which have a mean (median) of 35.85 percent (29.05 percent). In order to examine the effect of leverage on the long-run stock-price performance, we separately examine the long-term post-termination performance of targets with leverage changes above and below the median change. In Panel B, the mean (median) benchmark-adjusted buy-and-hold return for targets with a change in leverage less than the median change is –14.16 percent (–24.07 percent). Panel C reports the long-run post-termination performance of targets that increase leverage more than the median change. For this group the mean (median) benchmark-adjusted buy-and-hold return is 19.10 percent (13.72 percent).

One might conjecture that the higher long-run returns of the more levered targets are due to their higher betas (see Hamada (1972)). However, this does not appear to be the case. We measure beta for both groups over the five-year period under analysis. The mean (median) beta for targets that increase leverage more than the median change is 1.019 (1.023), which compares to 1.005 (1.003) for targets that increase leverage less than the median change. Perhaps the reduction in investment by the leverage-increasing firms reduces risk and thereby offsets the effect of leverage on their stocks' betas. In any event, we do not believe that it is differences in systematic risk that drive these differences in return.

One might also question whether we should conclude that investors underreacted to the leverage increase, when in many cases investors did not know about the leverage increase until many months after the takeover was terminated. To address this issue, we examine buy-and-hold returns of terminated targets from one year after the termination date, when the leverage change was definitely known, until five years after the termination date. We again find that the targets that increase their leverage the most outperform their benchmarks, in this case by 18.26 percent on average. In contrast, those terminated targets that increase leverage the least underperform their benchmarks by 12.25 percent on average. These results suggest that most of the excess returns associated with the leverage change following the termination date occurred subsequent to when the leverage change became known.

B. Was the Termination Decision in the Target Shareholders' Interests?

In order to determine whether the termination decision was in the interests of the leverage-increasing target shareholders, we must ask whether the positive stock price performance following the failed takeover offsets the loss of the premium that investors would have received had these takeovers succeeded. To address this question we compute the returns realized by the shareholders of these firms with a hypothetical return they would have realized had they sold their shares to the acquirer at the stated offer price and invested the proceeds in the benchmarks described earlier.¹⁸

Our analysis indicates that one dollar invested just after the termination in the shares of targets with leverage increases that are above the median is worth, on average, \$1.5469 when the firm is either delisted (e.g., because of a takeover) or after five years. In contrast, this initial dollar would have

¹⁸ Because the targets were offered the acquiring firm's stock in many of these takeover attempts it might make sense to consider the possibility that the target shareholders invest the proceeds of the takeover in the acquiring firm's stock rather than the benchmark portfolios. Loughran and Vijh (1997) examine the gains to receiving the acquiring firm's stock in successful offers and find that target shareholders who hold the acquiring firm's stock for five years following the takeover realize negative adjusted returns even after accounting for the takeover premium. Their results suggest that, had the takeover been successful, target shareholders may have realized returns that were considerably worse than is indicated by our benchmark portfolios.

been worth, on average, \$1.12 if the firm had been taken over at the offer price, and this \$1.12 would have subsequently grown, on average, to \$1.5185 if it were invested in the target's benchmark and held either until the sooner of the target's delisting date or five years. This evidence indicates that these target managers realize approximately the same level of wealth keeping their firms independent as they would have realized by accepting the takeover offer. On the other hand, shareholders of targets with leverage increases below the median are clearly made worse off, on average from the termination of the takeover.

C. Time-Series Analysis

The evidence presented in the previous subsection indicates that terminated targets that increase leverage more than the median perform considerably better than their characteristic-matched benchmarks. However, because of the difficulties associated with evaluating the statistical significance of long-term performance, we do not attempt to estimate whether the benchmark-adjusted long-term returns are statistically significant.¹⁹

To examine whether the excess returns of the leverage-increasing targets are statistically significant we perform a time-series analysis of an "investment portfolio" trading strategy. The trading strategy consists of forming separate portfolios of target firms and their matched counterparts over the entire period of the sample (January 1982 through December 1994). Each target firm is added to the target portfolio in the month following the termination of the failed takeover attempt and is kept in the portfolio for 60 months or until the firm ceases trading.

Similar to the last subsection, a characteristic-matched benchmark portfolio is formed for each target firm and these portfolios are then combined into a larger portfolio that mimics the characteristics of the target portfolio described above. The average monthly returns of this benchmark portfolio are then compared to the average monthly target portfolio returns. Assuming that the time-series of returns are independently and identically distributed allows us to test whether these monthly averages are reliably different.

Panel A of Table XII reports the mean monthly returns for portfolios of targets that change their leverage more than the median change. The results confirm the earlier finding that target firms that increase their leverage more than the median change outperform their matching counterparts. The monthly average difference between these target firms and their matching counterparts is 0.516 percent, which is significant at the 10 percent level. Panel B shows that target firms with changes in leverage that are below the median change have slightly lower returns than their matching counterparts.

¹⁹ See for example, Barber and Lyon (1997), Kothari and Warner (1996), and Brav (1997).

Table XII
Times-Series Analysis of Percentage Monthly Portfolio Returns
Post Failed Takeover Attempt for Targets and Their Matched
Firms from February 1982 to December 1994

Average monthly portfolio returns are reported for 437 target firms in unsuccessful takeover attempts and monthly returns for the portfolio of their matching firms from the period February 1982 to December 1994. Portfolio monthly returns are equally weighted averages of firm monthly returns. Target firms are added to their portfolio in the month following the termination of the takeover attempt and kept in the portfolio for 60 months or when the firm ceases trading. The matching firm is added to and removed from the matching-firm portfolio when its target firm is added or removed. Sample firms in unsuccessful takeover attempts for the 1982–1991 period are obtained from *Mergerstat Review*, published by W.T. Grimm. Returns are computed for calendar months using CRSP daily returns. Significance levels are based on *t*-tests.

	Mean Monthly Returns (%)
Panel A: Above-Median Change	
Portfolio of target firms with above-median change	1.652%***
Portfolio of matching firms for target firms	1.136%***
Portfolio return to target firms minus the portfolio return to their matching firms	+0.516%*
Panel B: Below-Median Change	
Portfolio of target firms with below-median change	0.949%***
Portfolio of matching firms for target firms	1.140%***
Portfolio return to target firms minus the portfolio return to their matching firms	–0.191%

*, **, *** Statistically different from zero at the 10, 5, and 1 percent significance levels, respectively.

D. Bradley, Desai, and Kim (1983) Revisited

In an earlier study of rejected takeovers, Bradley et al. (1983) report that targets that reject takeover offers and are not subsequently taken over lose all of the initial announcement period gains. Their evidence suggests that there are no long-run performance improvements in firms that remain independent. This should be contrasted with the significant performance improvements observed for the firms in our sample that increase leverage.

Our sample is different from the Bradley et al. sample in two important respects. First, as we mentioned in the introduction, a larger percentage of our failed targets remain independent and this is especially true in the sample of firms that increase leverage the most. Second, we do not find that failed targets that remain independent perform poorly on average. In fact, those target firms that increase their leverage outperform their matching counterparts by 41.16 percent (median = 29.73 percent) over the following five years. For targets that do not increase their leverage, the mean differ-

ence is -24.62 percent (median = -19.4 percent), suggesting that these failed targets perform very much like the failed targets in the Bradley, Desai, and Kim sample.

VII. Summary and Conclusions

Firms that increase leverage following an unsuccessful takeover attempt are subsequently taken over less often than those targets that do not increase leverage. Our results suggest that higher leverage decreases the probability of a firm being taken over because it commits the target's manager to make the improvements that would have been made by a potential raider. Specifically, those firms with the largest increase in leverage following a failed takeover reduce their levels of capital expenditures, sell off assets, reduce employment, increase focus, and increase their operating cash flows. These results are consistent with earlier evidence showing that the operating performance of firms improves following leverage-increasing recapitalizations (Kaplan (1989), Smith (1990), and Denis and Denis (1993)), and suggesting that leverage increases are associated with a change in incentives.²⁰ In contrast, failed targets that increase their leverage the least show insignificant changes in investment expenditures, assets sales, employment, and focus and show no improvements in their operating cash flows.

Our evidence suggests that investors anticipate the positive effects associated with higher leverage. During the period between the initial takeover announcement and the termination announcement the stock price performance is significantly less negative for those failed targets that increase leverage the most. However, stock prices of the leverage-increasing targets outperform their benchmarks for five years following the termination, which implies that investors initially underestimated the extent to which the values of these firms were improved. This evidence of long-term abnormal stock price performance indicates that, despite the initial drop at the time of the termination announcement, target managers may have been acting in the interests of shareholders when they turned down the takeover offer.

This evidence of underreaction is consistent with a growing body of research that suggests that investors underreact to both leverage-increasing and leverage-decreasing announcements (see, e.g., the articles cited in footnote 16). Daniel, Hirshleifer, and Subramanyam (1998) provide a behavioral

²⁰ However, Lowenstein (1985) suggests that the improvements following LBOs are due to the fact that managers choose to instigate LBOs only when they have favorable information about future productivity. Kaplan (1989) and Smith (1990) recognize this potential information bias and provide indirect evidence suggesting that superior management information is unlikely to account for the observed gains from management buyouts. First, Kaplan compares the prebuyout financial projections managers give to shareholders with the actual postbuyout realizations. He finds no evidence that the projections are low. He also finds that management turnover at the time of the buyout is unusually high. He concludes that none of these findings support the "managers' private information" hypothesis. Smith finds that operating returns do not increase after the failed management buyout attempts. She also finds that whether management initiated the MBO or not is not a factor in the postbuyout performance.

explanation for this underreaction. They argue that investors are overconfident about their abilities to value the stocks prior to the announcements and thus place too little weight on the information conveyed by the leverage changes. Although our results are consistent with the Daniel, Hirshleifer, and Subramanyam theory, they also suggest an alternative explanation: perhaps investors simply failed to anticipate the productivity improvements that tend to be associated with leverage increases.

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