

Leverage, Ownership Structure, and Returns to Shareholders of Target and Bidding Firms

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This paper tests for the joint effects of leverage and ownership structure in target firms on returns to shareholders in both target and bidding firms. For a sample of 81 targets and 81 bidders in successful takeovers covering the years 1980 through 1990, our event-study results indicate that the debt ratios of target firms are associated with significant positive abnormal returns for the shareholders of target firms. Correspondingly, the returns to shareholders of bidding firms are negatively affected by higher leverage in the target firm. In addition, we find that institutional ownership in targets has a positive effect on the excess dollar gains that accrue to their shareholders.

Introduction

According to Jensen and Ruback (1983), "...knowledge of the sources of takeover gains eludes us" (p. 47). Almost two decades later this knowledge remains elusive. Do leverage and ownership structure affect how returns to shareholders are allocated between target and bidding firms? This paper argues and tests that the target firm's share of the total gain from a takeover increases with leverage and managers' ownership in the target firm. More specifically, we examine the joint effects of capital structure, ownership structure, and relative size on the excess dollar returns to both bidding and target firms. We use the *Wall Street Journal Index* and the *Mergerstat Review* to develop our initial sample of tender offers covering the period 1980 to 1990.

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Our results for a sample of 81 targets and 81 bidders in successful takeovers support a leverage hypothesis but not a managerial hypothesis. We find that around the announcement of a takeover the debt ratios of target firms are associated with significant positive excess returns earned by the shareholders of target firms. Correspondingly, the returns to shareholders of bidding firms are negatively affected by higher leverage in the target firm. In addition, we find that institutional ownership in targets has a positive effect on the excess dollar gains that accrue to their shareholders, while managerial ownership in target firms has no effect on such gains.

Our results are consistent with Israel's (1991, 1992) hypothesis that the capital structure of the target firm affects the allocation of excess gains between bidders and targets. The findings are inconsistent, however, with the predictions of Harris and Raviv (1988) and Stulz (1988) where capital structure is important only because of its effects on management ownership in the target firm.

Theoretical Underpinnings and Empirical Evidence

This section briefly reviews the relevant theoretical background and the existing empirical literature dealing with the effects of leverage and ownership structure on the returns to shareholders of target and bidding firms.

Finance Theory: The Effects of Leverage, Ownership Structure, and Firm Size¹

Harris and Raviv (1988) and Stulz (1988) develop control-driven models of the target firm's capital structure and ownership structure. The use of leverage to affect the target firm's ownership structure is the primary focus of their models. During takeover contests, managers of target firms use debt to alter the distribution of their ownership. These authors argue that managers with limited personal wealth issue debt and use the proceeds to repurchase their firm's common stock from outside shareholders, thereby increasing their proportional ownership of the firm. This strategy improves the bargaining power of the managers with limited personal wealth in contests for control and allows management to extract higher premiums from bidders. The theory suggests a positive relationship between debt levels and the extent of managerial ownership in target firms and returns to target firms' shareholders in takeovers. In contrast, it implies a negative association for returns to shareholders of bidding firms.

Israel (1991) develops a model of an optimal capital structure based on value-maximizing managers who seek to balance the decreased probability of a tender offer with the gain to the target firm's shareholders. Ownership distribution plays no role in this approach. Leverage affects the probability and outcome of a tender offer through its effect on the distribution of cash flows to the parties in the acquisition. Israel argues

¹ This section draws on the theoretical models of Harris and Raviv (1988), Stulz (1988), and Israel (1991, 1992) as summarized in Raad and Ryan (1995).

that any synergistic gains from acquisitions are shared not only between the shareholders of the target and bidding firms, but also with the debtholders of the target firm. He points out that the portion of this gain that goes to target debtholders increases with the debt ratios of target firms. In contrast, the portion of the gain that accrues to equityholders of both bidders and targets decreases with the debt ratios of target firms. Because debt is issued at its fair value, however, the entire gain from a takeover is realized by the target firm's shareholders. Consequently, as leverage in target firms increases, the gains to bidders' shareholders should fall and those to the targets' shareholders should rise.

Israel (1991) uses acquisition costs and the bargaining power of the acquirer to build his model. He indicates that if the management of the target firm believes that the acquisition costs are high, it will use less debt in financing its firm. If the bidder has more bargaining power, however, the management of the target firm will use more debt financing.

Israel (1992) expands his derivation of an optimal capital structure by incorporating ownership structure into the model. In this extension, the role of debt continues to be a way for managers to capture for their shareholders the ex-ante synergistic gains from acquisitions. Ownership structure is established so that current management can control the outcome of the takeover. This model differs from those of Harris and Raviv (1988) and Stulz (1988) because Israel assumes that managers are not constrained by their personal wealth and, consequently, capital structure is not used as a means to alter the firm's ownership structure. Israel (1992) argues that target firms determine their optimal capital structure by finding a balance between the probability of an acquisition and the gain to its shareholders.

Empirical Studies

Walking and Edmister (1985), Travlos (1987), Bruner (1988), and Stulz, Walking, and Song (1990), among others, have estimated the relation between the capital and ownership structures of target firms and returns to their shareholders. Several empirical studies, e.g., Jensen and Ruback (1983), show that shareholders of target firms gain from takeovers while those of bidding firms do not.²

The literature also includes investigations of the relationship between various characteristics (i.e., firm and transaction factors) and returns to the target firm's shareholders. Winslow, Lane, and Yang (1983), Hang and Walking (1987), Kaufman (1988), and Peterson and Peterson (1991) document a positive relationship between premiums paid to target firms' shareholders and the use of cash as the method of payment in an acquisition. They argue that this relationship is driven by tax considerations. Walking and Edmister (1985) report that target firms with a declining trend in debt levels prior to takeover announcements receive, on average, higher

² Jarrell, Brickley, and Netter (1988) provide an overview of the evidence of shareholder gains in successful tender offers.

premiums than those with a rising trend. Kaufman (1988) finds no correlation between debt levels in target firms at the time of the announcement and the premium paid to those target firms. Peterson and Peterson (1991) report that returns to target firms' shareholders are negatively correlated with the size of the target firm relative to the bidding firm. Stulz, Walking, and Song (1990) report a negative correlation between abnormal returns accruing to target firms' shareholders and the number of shares of target firms owned by both bidding firms and financial institutions. They document a positive correlation between management holdings of the target firm's shares and the return to its shareholders from an acquisition, however.

Several studies have investigated the relationship between various factors and returns to the shareholders of bidding firms. Travlos (1987) reports that shareholders of bidding firms gain more in cash acquisitions than in stock acquisitions. Bruner (1987) documents a positive relationship between changes in debt levels in bidding firms and returns to their shareholders around announcements of acquisitions. Travlos and Papaionannou (1991) report no relationship between debt levels in the bidding firm and returns to its shareholders. Amihud, Lev, and Travlos (1990) find that the bidder's stock returns increase with the fraction of its shares owned by management. Asquith, Bruner, and Mullins (1983) report a positive relationship between the acquiring firm's stock returns and the relative size of the bidding and target firms. Bidders, of course, tend to be larger than targets.

The existing empirical research fails to address two important issues:

1. The relationship between either capital structure or ownership structure in target firms and returns to shareholders of both bidding firms and target firms; and
2. How the parties in the acquisition share the total gain from the transaction.

Because the models of Harris and Raviv (1988), Stulz (1988), and Israel (1991, 1992) develop predictions for these relationships, our contribution focuses on estimating empirical versions of the models. In particular, we examine the joint effects of capital structure, ownership structure, and relative size on the excess dollar returns to both bidding and target firms.

Data

We use the *Wall Street Journal Index* and the *Mergerstat Review*³ to develop our initial sample of tender offers covering the period 1980 to 1990. The sample includes only successful tender offers to ensure that management's motivation in opposing the tender offer is to extract a higher premium from the bidder and not to remain in control. To remain in the sample, a transaction had to meet the following criteria:

1. **Arms-length, whole-firm transaction**—The takeover target must be independent from the bidder and the offer must be for 100 percent of the target's shares in a single transaction. This criterion eliminates target firms in which the

³ *Mergerstat Review* is published annually by Merrill Lynch Business Brokerage and Valuation.

bidder might have had some bargaining power prior to the announcement of the takeover;⁴

2. **Public ownership**—Both target and bidding firms must be publicly owned;
3. **Financial data**—Both the target and bidding firms must have data on:
 - (a) The *COMPUSTAT Industrial Tapes* for leverage ratios for two years prior to the announcement date and
 - (b) The *Center for Research in Security Prices (CRSP)* tapes daily rates of returns from 160-days prior to the announcement date to the completion date of the takeover or the delisting of the target firm, whichever comes first. We determine a firm's leverage by dividing the book value of nonvoting securities by the sum of the book value of nonvoting securities and the market value of common equity. The book value of nonvoting securities equals the book value of total assets minus the book value of common equity;
4. **Ownership data**—Both the target and the bidding firms must have data on management and institutional ownership at the end of the year prior to the announcement of the tender offer. Management ownership data are obtained from *Spectrum 6*, which gathers this information from Forms 3 and 4 filed with the SEC (published twice a year in June and December) and from proxy statements filed with the SEC at the end of the year prior to the announcement date. Institutional ownership data are obtained from the *Standard & Poor's Stock Guide*.

We were able to construct a sample of 162 firms (81 targets paired with 81 bidders) that meet the above conditions. Table 1 presents some descriptive data for the sample firms. We observe that during the two-year period prior to the takeover announcement, the median debt ratios of targets drop from 47.9 percent at $t - 2$ to 42.9 percent at $t - 1$; in contrast, those of bidders are relatively flat at 40.5 percent ($t - 2$) and 41.5 percent ($t - 1$). Bidders are significantly larger than targets, by a factor of 11 based on the medians, \$143 million versus \$1.6 billion. The number of shares outstanding of target firms remains essentially constant over the two years prior to the takeover, while the shares of bidding firms increase slightly, mainly due to the fact that some bidders (34 of 81) used stocks to finance their acquisitions. Management ownership is significantly larger in targets than in bidders, while institutional ownership is larger in bidding firms than in target firms.

⁴ This requirement eliminates the effects of bidders' ownership in target firms on the division of gains between shareholders. Kaufman (1988) reports a negative relationship between target premiums and the percentage of target firms' shares owned by bidders prior to the announcement of takeovers. Nevertheless, a toehold of 5 percent by an acquirer in a target, as suggested by an anonymous reviewer, does not necessarily represent bargaining power. Because it is difficult to define the ownership percentage that represents bargaining power and because, as indicated by Stulz, Walking, and Song (1990) and Sudarsanam, Holl, and Salami (1996), the target's share of the takeover gains decreases with the fraction of the target's shares previously owned by the bidders, we consider only acquisitions of 100 percent of shares.

Table 1—Sample Statistics

Statistical description of ownership structure, capital structure, and size of the sample of target and bidding firms used in the study. This table includes means, medians, and standard deviations of debt ratios, total assets, number of shares outstanding, and management and institutional ownerships. The sample includes 162 firms, 81 targets paired with 81 bidding firms.

Variable	Target		
	Mean	Median	Standard Deviation
Debt-2	0.451	0.479	0.206
Debt-1	0.426	0.429	0.208
Asset*	694.1	143.5	2,421.1
Share-2*	14.23	6.30	23.40
Share-1*	14.26	6.79	27.46
Manhl	0.264	0.175	0.258
Insthl	0.349	0.335	0.254

Variable	Bidder		
	Mean	Median	Standard Deviation
Debt-2	0.423	0.405	0.213
Debt-1	0.439	0.415	0.200
Asset*	4,612.6	1,580.3	8,746.8
Share-2*	67.57	34.10	100.92
Share-1*	71.33	35.11	101.23
Manhl	0.160	0.103	0.258
Insthl	0.438	0.484	0.254

*Indicates millions of dollars or millions of shares

Debt-T = The [(book value of total assets - book value of common equity) / [(book value of total assets - book value of common equity) + Market value of common equity] of the *i*th target firm at the end of the year T prior to the announcement date; (T = -2 and -1; where year 0 is the year in which the announcement occurs)

Asset = The book value of total assets (in millions of dollars) at the end of the year prior to the announcement date

Share-T = The number of the common shares outstanding at the end of the year T. (T = -2 and -1; where year 0 is the year in which the announcement occurs)

Manhl = The percentage of the common shares outstanding held by management at the end of the year prior to the announcement date

Insthl = The percentage of the common shares outstanding held by financial institutions at the end of the year prior to the announcement date

The managerial and institutional ownership patterns follow what one would expect. One percent of a small firm is much smaller (dollar-wise) than 1 percent of a large firm; hence managers' holdings in larger firms are much smaller (in percentage terms). Three reasons help explain institutional ownership in larger firms:

1. More conservative investing in firms with long-established track records;
2. By gravitating toward larger firms, institutions have fewer names to follow in their portfolios; and
3. Although a \$1 million holding for a large firm may be prudent, the same investment in a much smaller firm may violate prudent investing standards.

Table 2—Cumulative Average Excess Returns of Target and Bidding Firms

Cumulative average excess returns, CAR, and cumulative average excess dollar returns, EDR, over periods beginning 30 days prior to and ending ten days subsequent to the initial announcement of the takeover for target and bidding firms, and for the consolidated sample.

Period	Total Sample (N = 162)	Targets (N = 81)	Bidder (N = 81)
(-30, -11)	0.0032	0.0432	-0.0044
(-10, -2)	0.0077	0.0762	-0.0082
(-1, 0)	0.0073	0.1324	-0.0140
(1, 10)	-0.0041	0.0000	-0.0016
(-30, 10)	0.0143	0.2518 ^a	-0.0283 ^a
EDR (-30, 10)	42.239	136.328 ^b	-51.850 ^b
Median Assets (\$ millions)	694	143	1,580

N = Sample size

EDR = Average excess dollar returns across firms in millions of dollars

$$EDR_{i(-30,10)} = CER_{i(-30,10)} \times MV_{i(-31)}$$

where:

$CER_{i(-30,10)}$ = The cumulative excess returns for the *i*th firm from day -30 to day 10 and

$MV_{i(-31)}$ = The market value of the common equity of firm *i* 31 days prior to the announcement date

^a $CAR_{i(-30,10)}$ for targets is significantly greater than that for bidders at the 0.0001 level ($t = 8.46$)

^b $EDR_{i(-30,10)}$ for targets is significantly greater than that for bidders at the 0.05 level, ($t = 2.05$)

Event-Study Tests and Results

We use standard event-study methods to test the significance of excess returns around the announcement day of the tender offer. We apply an estimation period from day -160 to day -31 to calculate the parameters of the market model, where day 0 is the announcement date of the tender offer. The cumulative average excess returns (CARs) for the two samples of targets and bidders are calculated over several periods around the takeover announcement date. In addition, we use a weighted-average excess return, $WAER_t$, similar to that used by Bradley, Desai, and Kim (1988) and Stulz, Walking, and Song (1990), to calculate the CARs for the combined sample. The $WAER$ is defined as:

$$WAER_t = [MV_{\text{target}(-31)} * e_{\text{target},t} + MV_{\text{bidder}(-31)} * e_{\text{bidder},t}] / [MV_{\text{target}(-31)} + MV_{\text{bidder}(-31)}],$$

where:

$e_{\text{target},t}$ and $e_{\text{bidder},t}$ = Target and bidder excess returns on day *t*, respectively;
and

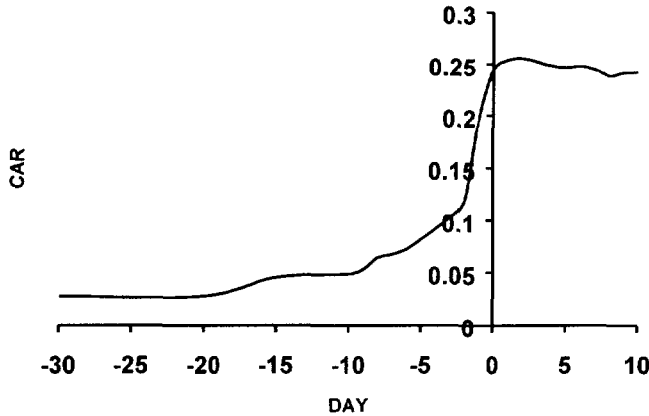
$MV_{\text{target}(-31)}$ and $MV_{\text{bidder}(-31)}$ = The market values of target and bidder common equity 31 days prior to the announcement date, respectively.

We express value to shareholders as both CARs and average excess dollar returns, EDR. We calculate the EDR for the *i*th firm using the following expression:

$$EDR_{i(-D,D)} = CAR_{i(-D,D)} * MV_i,$$

where:

$CAR_{i(-D,D)}$ = Cumulative excess returns of the *i*th firm from day -D to day D; and

Figure 1—Cumulative Average Excess Returns from Day -30 to Day 10 for Target Firms

MV_i = The market value of the i th firm's common equity 31 days prior to the announcement date of the takeover.

Table 2 shows that the 41-day CAR for the average target firm is 25.2 percent with over one-half of this return (13.2 percent) coming from the two-day window $(-1, 0)$. The gradual build-up of the average target's CAR in periods $(-30, -11)$ and $(-10, -2)$ suggests that our takeover samples qualify as partially anticipated events. (See Figure 1.) The post-announcement period $(1, 10)$ is a non-event. The CAR for the average bidding firm over the 41-day window is -2.83 percent with about one-half of it (-1.4 percent) coming over the two-day window $(-1, 0)$. The pre- and post-periods for the average bidder show a CAR pattern similar to that observed for the sample of target firms but in the opposite direction. The difference between the CARs is highly significant with a t -value of 8.46.

Turning to the excess dollar returns (EDRs), our sample of acquisitions created, on average, synergistic gains of \$42 million to be shared by stockholders of the target and bidding firms. The target firms' shareholders gain, on average, \$136 million, while bidders' shareholders lose \$52 million. This difference of \$188 million is statistically significant ($t = 2.05$). The t -value for the EDRs is substantially lower than the one for the CARs because the median market value of the bidding firm's equity is 11 times larger than the target's median market value of equity.

The findings of a wealth transfer from the shareholders of bidding firms to those of target firms, as reported in Table 2, are consistent with earlier studies.⁵

⁵ We also calculated the cumulative average excess returns and the cumulative average dollar returns from 30 days before the announcement to the completion date of the takeover or the

The Effects of Target Firms' Leverage

Both Stulz (1988) and Harris and Raviv (1988) argue that during takeover contests the target firm's management uses debt to increase its ownership and thereby increase its control over the contest's outcome. This increase in control helps managers extract higher premiums from the bidder. Moreover, Israel's (1991, 1992) value-maximizing models also predict that target firms will increase leverage during contests for control to increase the proportion of the takeover gain realized by their shareholders. An empirical implication of both control-driven and value-maximizing models is that shareholders of target firms with high leverage prior to the acquisition's announcement will realize greater gains than will shareholders of firms with low leverage. We also expect to observe lower gains to those bidding firms that seek to takeover high leveraged targets vis-à-vis those bidders that acquire low leveraged firms.

To test these predictions, we first divide our sample into two portfolios based on the target firm's debt ratio at the year-end prior to the announcement date of the takeover attempt, Debt-1, and examine the differences in CARs. We use the sample median of Debt-1 as the cut-off point.⁶ The 81 bidders are matched with each target based on the target's leverage. (See Table 1 for our definition of leverage.) Therefore, the two portfolios of bidders consist of 41 acquired firms with low leverage compared to 40 with high leverage.

Table 3 displays our results. The CAR over the 41-day window (-30,10) for the portfolio of target firms with high leverage is 28.2 percent, which is significantly higher ($t = 2.21$) than the 22.2 percent earned in the low leverage portfolio. For both portfolios, roughly one-half of the excess returns occur over the two-day window (-1, 0). In contrast, shareholders of bidders that acquire low leveraged firms earn CARs of -1.78 percent, while bidders that acquire high leveraged firms earn -3.68 percent. These differences are statistically significant ($t = 1.83$) at the 10 percent level and, given the results for the target firms, not unexpected. Again, the two-day window accounts for about one-half of the announcement effect.

Focusing on the EDRs reported in Table 3, we observe excess dollar returns of \$213 million for the targets with high leverage compared to \$60 million for those with low leverage. The t -value of 2.16 is similar to the one for the corresponding CAR. The average target firm with high leverage is larger, by a market-value factor of 2.7, than the average target with low leverage. The EDRs for the portfolio of bidders show that the shareholders of bidding firms that acquire high leverage targets experience losses of \$75 million compared to losses of \$28 million for acquirees with low leverage. The difference in these losses is significant at the 10 percent level ($t = 1.69$).

delisting of the target, whichever comes first. These excess returns do not differ from those between day -30 and day 10.

⁶ We use the median as the cut-off point because the use of the mean would force the size of our subsamples to be substantially different.

Table 3—Cumulative Average Excess Returns and Leverage in Target Firms

Cumulative average excess returns, CAR, and cumulative average dollar returns, EDR, to shareholders of a sample of targets and bidders, subdivided based on target median debt ratio, over several periods surrounding the announcement of a takeover.

Period	Target	
	Debt-1 $\leq$ Med (N = 41)	Debt-1 > Med (N = 40)
(-30, -11)	0.0269	0.0595
(-10, -2)	0.0664	0.0861
(-1, 0)	0.1386	0.1261
(1, 10)	-0.0104	0.0104
(-30, 10)	0.2216 ^a	0.2821 ^a
EDR(-30, 10) (\$ millions)	60.258 ^c	212.399 ^c

Period	Bidder	
	Debt-1 $\leq$ Med (N = 41)	Debt-1 > Med (N = 40)
(-30, -11)	-0.0045	-0.0044
(-10, -2)	-0.0078	-0.0086
(-1, 0)	-0.0083	-0.0198 ^b
(1, 10)	0.0028	-0.0060
(-30, 10)	-0.0178 ^b	-0.0368 ^b
EDR(-30, 10) (\$ millions)	-28.189 ^d	-75.512 ^d

N is the sample size

Debt-1 is the median of the debt-1 in target firms. Med = 0.4293. It is the [(book value of total assets - book value of common equity) / ((book value of total assets - book value of common equity) + market value of common equity)] of the target firm *i* at the end of the year prior to the announcement date

^aCAR_(-30,10) for targets with low leverage is significantly smaller than that for targets with high leverage at the 0.05 level (*t* = 2.21)

^bCAR_(-30,10) for bidders that acquire low leveraged firms is significantly greater than that for bidders that acquire high leveraged firms at the 0.10 level (*t* = 1.83)

^cEDR_(-30,10) for targets with low leverage is significantly smaller than that for targets with high leverage at the 0.05 level (*t* = 2.16)

^dEDR_(-30,10) for bidders that acquire low leveraged firms is significantly greater than that for bidders that acquire high leveraged firms at the 0.10 level (*t* = 1.69)

The findings in Table 3 support the predictions of the models of Stulz (1988), Harris and Raviv (1988), and Israel (1991, 1992). On balance, we find that the level of debt in target firms prior to the announcement date affects returns to both acquired and acquiring firms' shareholders.

The Effects of Target Firms' Ownership Structure

The theoretical models of Stulz (1988) and Harris and Raviv (1988) suggest that targets with high management ownership will earn more from successful tender offers than those targets with low management ownership. Consequently, bidding firms that acquire targets with high management ownership will more likely gain less from tender offers and vice versa. Israel (1991, 1992) makes no predictions for the effect of managerial ownership on takeover gains to either target or bidding firms.

Table 4—Cumulative Average Excess Returns and Management Ownership in Target Firms

Cumulative average excess returns, CAR, and cumulative average dollar returns, EDR, to shareholders of a sample of targets and bidders, subdivided based on the median percentage of ownership by target firm's management in the period prior to takeover announcement, over several periods surrounding the announcement of the takeover.

Period	Target	
	Man ≤ Med (N = 41)	Man > Med (N = 40)
(-30, -11)	0.0649	0.0215
(-10, -2)	0.0762	0.0763
(-1, 0)	0.1554	0.1093
(1, 10)	-0.0014	0.0013
(-30, 10)	0.2953 ^a	0.2084 ^a
EDR(-30, 10) (\$ millions)	245.750 ^b	26.906 ^b

Period	Bidder	
	Man ≤ Med (N = 41)	Man > Med (N = 40)
(-30, -11)	0.0046	-0.0042
(-10, -2)	-0.0038	-0.0127
(-1, 0)	-0.0162	-0.0119
(1, 10)	0.0023	-0.0055
(-30, 10)	-0.0223	-0.0343
EDR(-30, 10) (\$ millions)	-76.792 ^c	-26.908 ^c

N is the sample size

Med is the median of management ownership, Man, in target firms; Med = .1674

^aCAR_(-30, 10) for targets that have low management ownership is significantly greater than that of targets that have high management ownership at the .10 level (t = 1.87)

^bEDR_(-30, 10) for targets that have low management ownership is significantly greater than that of targets that have high management ownership at the .05 level (t = 2.27)

^cEDR_(-30, 10) for bidders that acquire firms with low management ownership is significantly smaller than that for bidders that acquire firms with high management ownership at the .10 level (t = 1.69)

In their empirical study of the effect of the role of ownership in takeovers, Stulz, Walking, and Song (1990) report that the gain to target firms' shareholders from acquisition decreases with the extent of institutional ownership. They attribute this result to the fact that some financial institutions are tax-exempt and, consequently, tend to accept lower premiums from bidding firms.

To investigate the hypotheses regarding shareholders' gains and target firms' ownership structure, we construct two different partitions of our sample:

1. Based on management's ownership of the target firm; and
2. Based on institutional ownership of the target firm.

Tables 4 (management ownership) and 5 (institutional ownership) present our results.

Table 4 shows that the CAR over the 41-day period (-30, 10) for the portfolio of target firms with low management ownership is 29.5 percent, which is significantly larger (t = 1.87) than the 20.8 percent for the firms with high management ownership. About one-half of these announcements come from the two-day window (-1, 0). Focusing on the EDRs, the portfolio with low management ownership shows a gain of

Table 5—Cumulative Average Excess Returns and Institutional Ownership in Target Firms

Cumulative average excess returns, CAR, and cumulative average dollar returns, EDR, to shareholders of a sample of targets and bidders, subdivided based on the median percentage of ownership of the target firm by institutions in the period prior to the takeover announcement, over several periods surrounding the announcement of the takeover.

Period	Target		Bidder	
	Inst ≤ Med (N = 41)	Inst > Med (N = 40)	Inst ≤ Med (N = 41)	Inst > Med (N = 40)
(-30, -11)	0.0193	0.0671	0.0018	-0.0107
(-10, -2)	0.0412	0.1113	-0.0048	-0.0116
(-1, 0)	0.0970	0.1677	-0.0081	-0.0200
(1, 10)	-0.0010	0.0010	-0.0013	-0.0019
(-30, 10)	0.1565 ^a	0.3471 ^a	-0.0124 ^b	-0.0442 ^b
EDR(-30, 10) (\$ millions)	13.952 ^c	258.705 ^c	-16.012 ^d	-119.713 ^d

N is the sample size

Med is the median of institutional ownership, Inst, in target firms; Med = .335

^aCAR_(-30, 10) for targets with low institutional ownership is significantly smaller than that for targets with high institutional ownership at the .01 level (t = 3.33)

^bCAR_(-30, 10) for bidders that acquire firms with low institutional ownership is significantly higher than that for bidders that acquire firms with high institutional ownership at the .10 level (t = 1.93)

^cEDR_(-30, 10) for targets with low institutional ownership is significantly smaller than that for targets with high institutional ownership at the .05 level (t = 2.56)

^dEDR_(-30, 10) for bidders that acquire firms with low institutional ownership is significantly higher than that for bidders that acquire firms with high institutional ownership at the .10 level (t = 1.88)

\$246 million compared to only \$27 million for the high management group ownership. (t = 2.27). The higher t-value for the EDRs compared to the CARs can be traced to a size effect, as the average target with low management ownership is six times larger than the one with high management.

We find no statistically significant difference between the returns to bidding firms based on management ownership.

Table 5, which presents the results of our investigation on the relationship between returns and institutional ownership of target firms, suggests that financial institutions, whether they are tax-exempt or not, use their power to maximize their returns from tender offers. Once again, we divide our sample based on the median ownership of the target firms by institutions and examine the CARs of the resulting portfolios of bidding and target firms. Targets in which financial institutions own less than the median portion of the shares outstanding gain only 15.6 percent, while those in which institutional ownership is greater than the median earn 34.7 percent (t = 3.33). The corresponding EDRs are \$14 million and \$259 million (t = 2.56). The reduced t-value can be attributed to a size effect, as the average target with high institutional ownership is almost eight times larger than its low institutional counterpart. Again, the two-day window (-1, 0) drives these results.

On the bidders' side, firms that acquire targets with low institutional ownership have a CAR of -1.24 percent compared to -4.42 percent for firms that acquire targets with high institutional ownership (t = 1.93). Because of a size effect, these CARs

translate into EDR losses of \$16 million (low institutional ownership) and \$120 million (high institutional ownership). The t-value of 1.88 is significant at the 10 percent level. These findings are inconsistent with those reported by Stulz, Walking, and Song. (1990).

Cross-Sectional Results

To examine the joint effects of proxies representing total gains of the acquisition and both the ownership structure and capital structure of target firms (including total excess dollar gains), we estimate the following regression equation:

$$EDR_i = \lambda_0 + \lambda_1 Tgains^- + \lambda_2 Tgains^+ + \lambda_3 Tdebt-1 + \lambda_4 LnTsize + \lambda_5 LnTmanhl + \lambda_6 LnTinsthl + E_i$$

where:

- EDR_i = The cumulative excess dollar gains from the acquisition that accrue to the i th firm from day -30 to day 10;
- $Tgains^-$ = The total excess dollar gains that accrue to both the target and bidder if it is negative;
- $Tgains^+$ = The total excess dollar gains that accrue to both the target and bidder if it is positive;⁷
- $Tdebt-1$ = The (book value of total assets - book value of common equity) divided by (book value of total assets - book value of common equity + market value of common equity) of the target firm at the end of the year prior to the announcement date;
- $LnTsize$ = The natural logarithm of the target's market value of common equity calculated 31 days prior to the announcement date;
- $LnTmanhl$ = The natural logarithm of management ownership in the target firm at the year-end prior to the announcement date; and
- $LnTinsthl$ = The natural logarithm of the percentage of shares outstanding owned by financial institutions in the target firm at the end of the year preceding the announcement date.

The motivation for this cross-sectional equation is straightforward. Size is a control variable. The other five measures are test variables that focus on the effects, *ceteris paribus*, of acquisition gains or losses, leverage, and management and institutional ownership on excess dollar returns.

Table 6 presents our cross-sectional results explaining the allocation of excess dollar gains to target and bidder shareholders. $Tgains^-$ has a significant negative effect on the excess dollar gains to shareholders of target firms but a significant positive effect on the gains to shareholders of bidding firms. $Tgains^+$ has positive effects, however, on

⁷ The gain variables are similar to those used by Stulz, Walking, and Song (1990). They are normalized by the market value of the target's total equity to avoid heteroscedasticity. We also use different variables for positive and negative total excess dollar returns. The target excess dollar return does not necessarily have to be positively correlated with the total excess dollar return when this total is negative.

Table 6—Joint Effects of Capital Structure, Ownership Structure, and Total Gains from the Acquisition on Dollar Returns

Results of the following regression equation:

$$EDR_i = \lambda_0 + \lambda_1 Tgains^- + \lambda_2 Tgains^+ + \lambda_3 Tdebt-l + \lambda_4 LnTsize + \lambda_5 LnTmanhl + \lambda_6 LnTinsthl + E_i$$

where:

- EDR_i = The excess dollar gains from the acquisition that accrue to the acquired firm i and is calculated as $EDR_i = CAR_{i(-30,10)} * MV_i$
- $CAR_{i(-30,10)}$ = Measured as the cumulative excess returns of the i th firm from day -30 to day 10;
- MV_i = The market value of the i th firm's common equity 31 days prior to the announcement date of the takeover;
- $Tgains^-$ = The total dollar gains that accrue to both the target and bidder if it is negative;
- $Tgains^+$ = The total dollar gains that accrue to both the target and bidder if it is positive;
- $Tdebt-l$ = Determined by dividing the book value of nonvoting securities by the sum of the book value of nonvoting securities and the market value of common equity of the target firm. The book value of nonvoting securities equal the book value of total assets minus the book value of common equity of the target firm l at the end of the year prior to the announcement date;
- $LnTsize$ = The natural logarithm of the i th target's market value of common equity 31 days prior to the announcement date;
- $LnTmanhl$ = The natural logarithm of management ownership in the target firm at the year-end prior to the announcement date; and
- $LnTinsthl$ = The natural logarithm of the percentage of the target's shares outstanding owned by financial institutions at the year-end prior to the announcement date

Variable	Target			Bidder		
	Coefficient	T-Statistic	Prob > t	Coefficient	T-Statistic	Prob > t
Intercept	0.185	0.39	0.697	0.19	0.93	0.354
Tgains-	-0.046	-3.21	0.002	0.013	2.05	0.044
Tgains+	0.033	1.95	0.056	0.025	3.34	0.001
Tdebt-l	0.27	2.03	0.046	-0.097	-1.75	0.09
LnTsize	-0.001	-0.06	0.952	-0.010	-0.94	0.351
LnTmanhl	-0.024	-1.16	0.250	-0.001	-0.01	0.921
LnTinsth	0.087	2.90	0.005	0.008	-0.005	0.547
F-Statistic = 4.87			F-statistic = 4.03			
R-Square = 0.29			R-Square = 0.25			
Adj. R-Square = 0.23			Adj. R-Square = 0.19			
Prob. > t = 0.0003			Prob. > t = 0.0016			

the excess dollar gains to shareholders of both target and bidding firms. These results suggest that when the acquisition creates positive net total gains, both target and bidder shareholders receive, on average, a positive share of the gains. No transfer of wealth from one party to the other occurs. When the total gains from the acquisition are negative, however, shareholders of target firms receive dollar gains at the expense of shareholders of bidding firms who suffer losses. This result suggests that a transfer of wealth from bidder shareholders to target shareholders occurs. Stulz, Walking, and Song (1990) report only a significant positive effect on the target's gain when the total gain is positive. Dollar gains to target firms' shareholders are significantly positively related to $Tdebt-l$. In contrast, dollar gains to bidding firms' shareholders are associated with less leverage. These findings are consistent with Israel's models (1991, 1992) in which leverage in target firms is positively (negatively) related to the gains captured by shareholders of targets (bidders).

Focusing on ownership issues, gains are not statistically related to management ownership of the target firm as captured by LnTmanhl . This result is not predicted by the control-driven theoretical models of Harris and Raviv (1988) and Stulz (1988) and is not consistent with the empirical results reported by Stulz, Walking, and Song (1990). Israel is silent on a management-ownership effect. In contrast, institutional ownership, LnTinsthl , has a significant positive effect on the gains that accrue to targets' shareholders and no effect on the gains to bidders' shareholders, a result inconsistent with that of Stulz, Walking, and Song (1990).⁸

Finally, our results indicate that the size (LnTsize) of the target firm has no effects on the excess dollar gains to both target and bidding firms' shareholders. This finding is inconsistent with that of Peterson and Peterson (1991), who report that the relative size is essential in determining the allocation of synergistic gains to the shareholders of target and bidding firms but consistent with Stulz, Walking, and Song (1990).⁹

Summary and Conclusions

Jensen and Ruback (1983) stress that our knowledge of the sources of gains from takeovers is elusive. Our contribution presents evidence that a target firm's share of the total gain from a takeover increases with leverage and institutional ownership in the target firm. Using the *Wall Street Journal Index* and the *Mergerstat Review*, we generate a sample of 81 targets and 81 bidders in successful takeovers covering the years 1980 through 1990. Our event-study results indicate that the debt ratios of target firms are associated with significant positive abnormal returns for the shareholders of target firms. Correspondingly, the returns to shareholders of bidding firms are negatively affected by higher leverage in the target firm. In addition, we find that institutional ownership in targets has a positive effect on the excess dollar gains that accrue to their shareholders while managerial ownership in target firms has no effect on such gains.

Regarding gains to shareholders of bidding firms, we find no statistically significant effects related to the ownership structure of the target firms. Moreover, the size of the target firm has no effect on the gains accruing to the shareholders of either target or bidding firms. Finally, our results suggest that when the synergistic gains of an acquisition are positive, both target and bidder shareholders receive, on average, a

⁸ When the target's board is independent, Cotter, Shivdasani, and Zenner (1997) find that the initial tender-offer premium, the bid-premium revision, and the target shareholder gains over the entire tender-offer period are higher. In addition, the presence of a poison pill and takeover resistance leads to greater premiums and shareholder gains. They conclude that independent outside directors enhance target gains from tender offers and that boards with a majority of independent directors are more likely to enhance shareholder wealth by resisting takeover attempts.

⁹ A test for collinearity between the size of the target firm and the ownership variables revealed that correlation was not a problem that would seriously affect the estimates of the regression coefficients.

positive share of the gains. When the total gains from the acquisition are negative, however, shareholders of target firms receive dollar gains at the expense of shareholders of bidding firms who suffer losses. This finding indicates a transfer of wealth from bidder shareholders to target shareholders.

Our results are consistent with Israel's (1991, 1992) hypothesis that the capital structure of the target firm affects the allocation of excess gains between bidders and targets. They are inconsistent, however, with the predictions of Harris and Raviv (1988) and Stulz (1988) that contend that capital structure is important only because of its effects on management ownership in the target firm.

While our knowledge about the sources of gains from corporate takeovers is likely to remain elusive and less than complete, we can take comfort in the fact that two of the fundamental tenets of modern finance, capital structure and type of ownership, contribute to our present understanding.

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