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Bustup Takeovers of Value-Destroying Diversified Firms

PHILIP G. BERGER and ELI OFEK*

ABSTRACT

We examine whether the value loss from diversification affects takeover and breakup probabilities. We estimate diversification's value effect by imputing stand-alone values for individual business segments and find that firms with greater value losses are more likely to be taken over. Moreover, those acquired firms whose losses are greatest are most likely to be bought by LBO associations, which frequently break up their targets. For a subsample of large diversified targets: (1) higher value losses increase the extent of post-takeover bustup; and (2) post-takeover bustup generally results in divested divisions being operated as part of a focused, stand-alone firm.

BERGER AND OFEK (1995) CONFIRM recent evidence by Lang and Stulz (1994) of a value loss from diversification in the 1980s, which Servaes (1996) finds also occurred in the 1960s, and, to a lesser extent, in the 1970s. Berger and Ofek use segment-level data to estimate the magnitude of the loss and find that, during 1986–1991, the average diversified firm destroyed about 15 percent of the value its lines of business would have had if operated as stand-alone businesses. The evidence that diversification represents a suboptimal managerial strategy suggests that internal control systems do not prevent managers from destroying significant amounts of value. The value destruction does, however, generate large profit opportunities for outsiders. The natural question that arises is whether these profit opportunities result in takeovers disciplining the management of firms with large and persistent value losses from diversification.

The U.S. market for corporate control reached its zenith during the last half of the 1980s. The many takeovers and leveraged buyouts (LBOs) during this period transferred control over corporate resources which, in many cases, had been under the control of diversified corporations. Marris (1963) and Manne (1965) argue that the difference between actual and potential stock prices in firms operated suboptimally creates incentives for outsiders to acquire these firms and improve operations. Jensen (1986) extends this reasoning to value-

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destroying diversification by contending that many takeovers are designed to undo previous unprofitable acquisitions by target firms. Given the persistence of the value losses documented by Berger and Ofek (1995) and Lang and Stulz (1994) for diversified companies, the takeover and LBO wave of the 1980s may partially represent an attempt to break up diversified firms that destroy value.

Breakups of target assets occur regularly following mergers or acquisitions. Bhagat, Shleifer, and Vishny (1990) find that sell-offs occur frequently following 62 large hostile takeovers undertaken between 1984 and 1986. Kaplan and Weisbach (1992) examine divestitures of target company assets following large acquisitions and find that almost 44 percent of the target companies are later divested. Moreover, they find that acquirers of firms in unrelated businesses are more likely to later divest their targets than acquirers of related businesses. They also document that the most frequently announced reason for the divestitures is to refocus the acquiring company. Mitchell and Lehn (1990) show that firms that subsequently become takeover targets are more likely to have made bad acquisitions (i.e., ones that significantly reduce their equity value). In addition, they find that the worst acquisitions made by targets are those that are later divested either in bustup takeovers or restructuring programs to thwart takeover.¹

Berger and Ofek (1995) find that overinvestment in, and excessive subsidization of, poorly performing segments contributes to the value loss from diversification. Such managerial decisions are reversible, and selling off the divisions of a diversified firm to buyers who will operate them as stand-alone, focused businesses, may facilitate the necessary changes in management structure. For example, managers can more easily be given high equity ownership in a broken-off piece of a conglomerate than in the conglomerate itself, and board members can monitor a focused business more closely. Recent evidence shows that increasing focus is value-enhancing. John and Ofek (1995) provide evidence that increase in focus is a major factor in explaining seller gains from asset sales, and Comment and Jarrell (1995) find a positive relation between abnormal stock returns and increases in focus as measured by either the number of segments reported by management or by accounting-based Herfindahl indices.

Potential acquirers have an incentive to take over and break up the most value-reducing diversified targets, because empirical evidence indicates that bidders do better when they target poorly managed targets. Lang, Stulz, and Walking (1989) and Servaes (1991) find that bidders earn higher returns when their targets have lower Tobin's q ratios. Interpreting q as a measure of managerial performance, these results are consistent with bidders earning greater profits when their targets' managers have destroyed more value.

¹ Contrasting evidence is provided by Healy, Palepu, and Ruback (1992), who find a modest increase in book value of asset sales, but not in cash proceeds from disposals, from the *combined* target and acquirer firms in years following the 50 largest mergers completed during 1979 to mid-1984. Healy, Palepu, and Ruback also find that asset sales by the *combined* target and acquirer in the years before and after the merger are a small portion of the market value of total assets.

Consistent with the greater profit potential of more poorly managed targets, prior research shows that firms with lower q ratios have greater takeover probabilities (Hasbrouck (1985), Morck, Shleifer, and Vishny (1988), and Barber, Palmer, and Wallace (1995)).

The value loss from diversification, the use of break-ups after takeover, the ability to create value by increasing focus, bidders' ability to earn higher returns by targeting poorly managed firms, and poorly managed firms' higher probability of being taken over are all established in the extant literature. Our contribution is to investigate how these strands of evidence may be linked in the context of takeovers and breakups of diversified firms.

To test the relation between value destruction and takeover probability, we follow Berger and Ofek (1995) in comparing the sum of the imputed stand-alone values of the segments of diversified companies to the actual values of those companies. The resulting construct, which we measure in 1984 and 1987, is designed to capture the value loss from diversification. We then identify all takeovers of these diversified companies in the four-year period following each base year and relate the magnitude of the value loss to the likelihood of takeover. We find that, after controlling for other determinants of takeover, greater value losses are associated with higher takeover probabilities.

As a check on whether the value losses we measure are actually associated with firms' diversification strategies, we also impute values for stand-alone firms and calculate differences between actual and imputed values for these firms in 1984 and 1987. We then identify all takeovers of these stand-alone firms during the four-year periods following the measurement of value loss. We use both binomial and multinomial logistic regressions to compare value destruction's effect on takeover probability between diversified and stand-alone firms. The binomial logit results show that variation in value loss affects takeover likelihood somewhat more for multi-segment than one-segment firms, although the difference is not significant at conventional levels. These results show that diversified firms' takeover probabilities are at least as sensitive as those of single-line firms to variation in value loss, but they do not provide any information about the effect on takeover likelihood of the much greater average level of value loss for diversified companies. The multinomial logits do so, and their results show that the effect of value destruction on the probability of being a takeover target is significantly greater when comparing diversified targets to all nontargets than it is when comparing stand-alone targets to all nontargets. Overall, because value loss and diversification are correlated, it is impossible to completely disentangle the extent to which general value loss versus value loss associated with diversification policy affects the takeover likelihood of diversified companies. The binomial logits cannot reject the hypothesis that general value loss alone affects takeover likelihood, but they do not take account of the correlation between value loss and diversification. The results from the multinomial logits are consistent with *value destruction associated with diversification policy* affecting takeover likelihood, but these results may overcorrect for the correlation between value loss

and diversification by comparing each type of target firm (diversified and stand-alone) against all nontarget firms.

We use both indirect and direct evidence to investigate further whether the opportunity to reverse value destruction through bustup underlies the relation we document between value destruction and subsequent takeover. First, for the diversified firms that are subsequently taken over, we compare those acquired by LBO associations to the rest. Jensen (1989) argues that the organizational changes associated with LBOs makes them particularly likely to take value-increasing actions, such as breaking apart lines of business that are more valuable when separated. Moreover, LBOs often need to sell off acquired assets to pay down acquisition debt. We find that, among subsequently acquired diversified firms, greater value losses enhance the likelihood that the acquirer is an LBO, consistent with LBO associations being more likely than other bidders to break-up the target.

Second, we examine in detail the subsample of targets which had values exceeding \$250 million before being taken over. For this subsample of large targets, we examine whether the value loss from diversification is related to the extent of post-takeover bustup. Defining bustup dichotomously, based on the number of target divisions sold following takeover, we find that 50 percent of the large diversified targets are broken up, and that the mean value effect of diversification is -21 percent to -37 percent for these firms. In contrast, those firms not broken up after takeover have a significantly smaller mean valuation effect from diversification of -5 percent. Measuring the extent of bustup continuously, as the proportion of target value subsequently divested, we find that the value effect of diversification is significantly negatively related to the extent of bustup.

Finally, for the subsample of large targets, we examine the buyers of divisions divested from diversified targets after takeovers. We classify LBOs and single-line firms in a business related to that of the divested division as likely to operate the acquired division as a focused business, and find that 75 percent of the identifiable buyers are either LBOs or focused, related firms. Overall, our results are consistent with the market for corporate control targeting and breaking-up combinations of business lines which have greater value when each line is operated on a stand-alone basis.

Section I presents sample selection details, describes the sample, and explains our empirical approach. Section II tests the relation between value destruction from diversification and the probabilities of subsequent takeover and break-up. Section III examines who the buyers are in post-takeover breakups, and Section IV concludes. The Appendix provides additional details on our empirical approach and variable construction.

I. Sample Selection and Estimation of Segment Values

A. Sample Selection and Description

FASB No. 14 and Securities and Exchange Commission (SEC) Regulation S-K require firms to report segment information for fiscal years ending after

December 15, 1977. Firms must report audited footnote information for segments whose sales, assets, or profits exceed 10 percent of consolidated totals. The COMPUSTAT Industry Segment (CIS) database (active and research files) reports segment information for all COMPUSTAT firms other than utility subsidiaries.

For our main sample (diversified firms), we obtain data for all firms on the CIS database during either 1984 or 1987 that have at least two segments, total sales of at least \$20 million, and no segments in the financial services industry (Standard Industrial Classification (SIC) codes between 6000 and 6999). We require firms to have sales of at least \$20 million to avoid distorted valuation multiples for firms with sales or assets near zero. Firms with financial services segments are removed from consideration because applying the valuation methods we use is problematic for such firms. To be included in the final sample, diversified corporations must have available data on the CIS, Compustat, and Center for Research in Security Prices (CRSP) data files. Additionally, total capital (measured as market value of common equity plus book value of debt) for the firm must be available. Unlike assets, sales are usually completely allocated among the reported segments of a diversified firm; therefore, we require that the sum of segment sales must be within 1 percent of total sales for the firm. Panel A of Table I shows that these procedures result in a total sample of 1,513 multi-segment firms, with 1,192 observations in 1984 and 1,085 observations in 1987.

We also use a secondary sample of single-segment companies, which are selected using the same selection criteria described above for the multi-segment firms (except for the requirement of multiple segments). The stand-alone sample we obtain, but do not describe in Table I, contains 1,558 firms, with 1,038 observations in 1984 and 798 observations in 1987.²

We determine which sample firms had takeovers that were announced in the four fiscal years following the base year, and identify which takeovers are by LBO groups. We document which sample firms have CRSP delisting dates prior to December 31, 1993, the last date with available information on CRSP at the time we conducted our tests. For all such firms, we investigate whether the reason for delisting was a takeover, and what the announcement date of the takeover was, by examining the *W.T. Grimm Mergerstat Review* and the Investment Dealer's Digest U.S. M&A (IDDMA) file of the Lexis/Nexis database. LBO acquirers are separately identified by both sources. As Table I shows, these procedures identify a total of 334 takeovers of diversified firms, of which 47 are LBOs. The four-year period following 1984 contains 251 announcements of successful takeovers (28 LBOs), whereas the period following 1987 has 127 (25).

² The sample selection criteria result in twice as many observations for both 1984 and 1987, of which we eliminate half to reduce the data collection needed to identify firms subsequently taken over. The eliminations are achieved by sorting the sample by SIC code, then eliminating every second firm. The remaining single-segment firms thus have industry representation proportional to the full sample of single-line companies.

Table I**Takeover and LBO Frequencies for the Sample of Diversified Firms**

The sample of diversified firms includes 2,277 observations for 1,513 firms from the Compustat Industry Segment (CIS) database for fiscal years 1984 and 1987 that have at least two segments, total sales of at least \$20 million, and no segments in the financial services industry (Standard Industrial Classification (SIC) codes 6000–6999). All sample firms have available data on the CIS, COMPUSTAT, and Center for Research in Security Prices (CRSP) data files, and have the sum of segment sales within 1 percent of total sales for the firm. Panel A displays the frequencies with which sample observations were subsequently taken over during the following four fiscal years by any acquirer, and by an LBO acquirer, for the total sample and for the 1984 and 1987 subsamples. Panel B displays the frequencies with which sample observations were taken over by any acquirer, and by an LBO acquirer, during each year 1985–1991, and in total.

Panel A: Sample Takeover/LBO Frequencies for the Total Sample and the 1984 and 1987 Base Years			
	Total	1984	1987
Number of firms	1513	1192	1085
Takeovers	334	251	127
Takeover Frequency	22%	21%	12%
LBOs	47	28	25
LBO Frequency	3%	2%	2%

Panel B: Takeovers and LBOs by Year of Announcement		
Fiscal Year Announced	Takeovers	LBOs
1985	61	5
1986	63	6
1987	62	9
1988	80	15
1989	44	11
1990	17	1
1991	7	0
Total	334	47

Panel A of Table I shows that takeover frequency is high among our sample of multi-segment firms, especially during 1985–1988. Twenty-one percent of the diversified firms from 1984 are taken over in the following four year period, whereas, for the 1987 sample, the frequency is 12 percent. For single-line firms, the corresponding rates are 13 percent in 1984 and 19 percent in 1987 (not reported in a table). Panel B shows the distribution of takeovers and LBOs during the 1985–1991 period. The 80 takeovers and 15 LBOs in 1988 make it the most active year for acquisitions of the firms in our sample. Takeover frequency begins to decline sharply after 1989, with just 17 takeovers of sample firms in 1990 and seven in 1991. Acquisitions by LBOs decrease even more rapidly than other takeovers after the demise of Drexel Burnham Lambert, with just one of the 24 takeovers in 1990–1991 performed by an LBO.

B. Estimating Segment Values Using Multipliers

To measure diversification's value effect, we follow the procedures described in Berger and Ofek (1995). We measure the percentage difference between a firm's total value and the sum of imputed values for its segments as stand-alone entities (see the Appendix for additional details not described below). We calculate the imputed value of each segment by multiplying the median ratio, for single-segment firms in the same industry, of total capital to one of two accounting items (assets or sales) by the segment's level of the accounting item. The industry median ratios are based on the narrowest SIC grouping that includes at least five single-line businesses with at least \$20 million of sales and sufficient data for computing the ratios.

The sum of the imputed values of a company's segments estimates the value of the firm if all of its segments are operated as stand-alone businesses. The natural log of the ratio of a firm's actual value to its imputed value is our measure of excess value, or the gain or loss in value from diversification. Negative excess value indicates that diversification reduces the value of segments below that of their stand-alone counterparts.

C. Tying the Value Loss to Takeover Probability

We examine the association between the value loss from diversification in two base years, 1984 and 1987, and the likelihood of subsequent takeover in the following four-year periods. A four-year period is a relatively short one in which to follow takeover activity. As discussed below, we identify takeovers over a relatively short period in order to ensure that variation in base year value losses reflects variation in value losses throughout the potential takeover period.

We examine the validity of our assumption that diversified firms with greater value losses in a base year continue to have greater value losses from diversification during the following four years. We calculate autocorrelation coefficients for lags of one to five years for excess value measures based on multiples of assets, sales, and earnings before interest and taxes (EBIT). The autocorrelation results (which are not presented in a table) show that the excess value measures using both the asset and sales multipliers are highly correlated over time. The average correlation between a firm's value losses in adjacent years is 0.80 for both multipliers. The autocorrelation decreases with the time lag, yet even for observations four years apart, it averages 0.46 to 0.48. The stability over time of the excess value measure obtained with the EBIT multiplier is, however, much smaller. We therefore use only the asset and sales multipliers in our tests.³

³ We also examine whether, for diversified firms subsequently taken over, the value loss varies systematically with the time between the base year and the date of takeover. We group the targets into those acquired one, two, three, and four years after the base year. We find no systematic relation between the amount of excess value in the base year and the time lag until takeover. For example, the mean excess value using the asset (sales) multiplier ranges from -17 percent (-22

The autocorrelation results, combined with the sample frequencies in Panel A of Table I, illustrate a research design trade-off between measuring excess value near the time of takeover versus a possible lack of independence from measuring values for the same firm at different times. The autocorrelations show that the longer the time lag between measuring excess value and the date of takeover, the less the association between the value loss at the time of takeover and the value loss in the base year. Panel A of Table I shows that using two base years results in many firms entering the sample in both years. The sample contains 1,513 firms, but 2,277 observations (the sum of the observations in the 1984 and 1987 subsamples). To address the independence concern that arises from some firms entering the sample twice, we report results separately for each base year, and we report the sensitivity of the inferences from the combined-years sample to a conservative standard error adjustment.

II. Value Loss from Diversification and Subsequent Takeover

A. Total Value Destruction and Subsequent Takeovers

To investigate whether the market for corporate control acts to undo the persistent value losses from diversification, we see whether diversified firms in which more value is being destroyed are more likely to be taken over. Table II shows that value destruction is greater among diversified firms subsequently taken over than it is among firms that do not experience a control change. Using the asset (sales) multiplier, the mean value loss among firms subsequently taken over is 22.2 percent (31.8 percent), which is 5 percent (10.6 percent) more than the loss among other diversified firms. The differences in mean value destruction between targets and nontargets are significant at better than the 0.05 level. These results are consistent with acquirers targeting those multi-segment firms whose diversification policies result in greater value losses. The difference in value destruction between targets and nontargets is negative in both 1984 and 1987, consistent with acquirers targeting value destroying firms in both the 1985–1988 and the 1988–1991 periods. The inferences remain similar when the median value destruction of targets and nontargets is compared. For the full sample, future targets destroy 2.6 percent more value based on the asset multiplier and 9.3 percent more (significant at the 0.01 level) using the sales multiplier. The only case in which targets do not have greater median value destruction is for the 1987 sample using the asset multiplier.

The preceding univariate tests do not control for factors, other than excess value, that may affect takeover likelihood. We therefore perform multivariate logit regressions in which a takeover indicator is the dependent variable, and the nontakeover group includes both stand-alone and diversified firms. The independent variables are previously identified explanators of takeover prob-

percent) to –29 percent (–40 percent), with the greatest value loss for targets acquired two years after the base year and the smallest value loss for targets acquired three years after the base year.

Table II

Comparison of Value Destruction Between Diversified Firms That Do and Do Not Become Takeover Targets

The table presents mean and median excess value measures for the sample of 2,277 observations of diversified firms from fiscal years 1984 and 1987. Sample observations are grouped into those that were taken over during the subsequent four fiscal years and those that were not taken over during that period. The asset multiplier measure of excess value is the natural logarithm of actual value/imputed value where: actual value is total book value of debt plus market value of equity, and imputed value is the sum of imputed values of the firm's segments. Each segment's imputed value is the segment's assets multiplied by its industry median capital-to-assets ratio. The sales multiplier measure of excess value is the natural logarithm of actual value/imputed value with each segment's imputed value equal to the segment's sales multiplied by its industry median capital-to-sales ratio.

Sample	Means			Medians		
	No takeover	Takeover	Difference	No takeover	Takeover	Difference
Excess value, asset multiplier						
Full sample	-0.172	-0.222	-0.050 ^b	-0.204	-0.230	-0.026
1984 sample	-0.189	-0.220	-0.031	-0.199	-0.243	-0.044 ^c
1987 sample	-0.155	-0.224	-0.069 ^c	-0.214	-0.180	0.034
Excess value, sales multiplier						
Full sample	-0.213	-0.318	-0.106 ^a	-0.230	-0.323	-0.093 ^a
1984 sample	-0.245	-0.318	-0.073 ^c	-0.277	-0.338	-0.061 ^c
1987 sample	-0.182	-0.316	-0.134 ^a	-0.179	-0.266	-0.087

^{a,b,c} denotes that the mean (median) difference is significantly different from zero at the 0.01, 0.05, and 0.10 two-tailed probability level, respectively.

ability taken from Palepu (1986), two interactive variables set equal to excess value if the observation is for a multi-segment firm in the first case, and for a stand-alone firm in the second case, and the number of segments reported by management. The interactive variables separate the effects on takeover likelihood of variation in excess value for the diversified versus single-line companies, whereas the number of segments variable controls for any additional effect of the extent of diversification on takeover probability. All independent variables are measured in the base year (1984 or 1987) for the observation.

We modify those Palepu (1986) variables, which use the book value of equity, by either replacing it with the book value of total assets or by placing it in the numerator (rather than the denominator) of ratios. We make these modifications in order to avoid negative figures in the denominators of ratios and in quantities where we use log transformations. Palepu's original measures are noted in parentheses when they differ from ours. Return on assets (return on equity) is the ratio of earnings before interest, taxes, and depreciation to total assets. Size is the log of total assets (net book value of assets). Liquidity is the ratio of net liquid assets to total assets. The net liquid assets are defined as the cash plus the marketable securities less the current liabilities. Book-to-market (market-to-book) ratio is book equity over market value of common equity. Growth is the annual rate of change in sales. Leverage is the ratio of debt to

assets (long-term debt to equity). Palepu finds that growth, leverage, and size are significantly negatively related to acquisition likelihood.

Table III presents estimations of the takeover likelihood models. We use the takeover likelihood estimations to evaluate the economic importance of the explanatory variables. The magnitudes of the coefficients from a discrete choice model are, however, difficult to interpret because the marginal effects of each variable on the choice probability depend on all of the data in a nonlinear manner. To aid in interpretation, we present "standardized elasticities" for each variable in Tables III–V. The standardized elasticities are calculated by first determining the probability of takeover at an evaluation point on the cumulative logistic distribution. We use the point that results when all of the explanatory variables have their median values.⁴ The elasticity for a given variable is then the amount by which the probability of takeover increases above this evaluation point when the variable's median is replaced with either its 25th or 75th percentile (whichever leads to a probability increase).

Table III shows that excess value has a strong negative relation with takeover probability for the multi-segment firms, indicating that firms destroying more value with their diversification strategy are more likely to be taken over.⁵ For the overall, the 1984, and the 1987 samples, the estimate on excess value from diversified firms is always negative for both the asset and sales multiplier measures. The multi-segment firm value loss coefficient estimates are significant at the 0.01 level for the full sample, and at better than the 0.10 level for the 1984 and 1987 samples. The relation between excess value and takeover probability is somewhat weaker for the single-line firms. The estimates on excess value are always smaller for stand-alone companies than for diversified firms, and the estimates for the one-segment sample are significant at better than the 0.10 level in only two of the six regressions. A chi-squared test for the equality of the estimates on the two interactive variables shows, however, that they are not significantly different at better than the 0.10 level in any of the six regressions. The evidence thus indicates that variation in excess value has an equal (or, perhaps, marginally greater) effect on takeover likelihood for diversified versus single-line firms.

Note that significance levels for the full sample in Table III may be overstated because observations for the same firm are sometimes included for both 1984 and 1987. Therefore, we compute conservatively adjusted standard errors for all full sample binomial logits reported in the paper. The adjusted standard errors result from reestimation in which a weighted residual sum of squares is minimized, with the observations of firms that enter the sample twice, assigned half the weight of other observations. For the Table III full sample, the

⁴ Note that the nonlinearity of the logit model could make inferences sensitive to the evaluation point chosen.

⁵ Note that all of the reported inferences are insensitive to excluding related diversified firms from the sample, where related diversified firms are those in which all segments report the same main two-digit SIC code. All reported inferences are also unchanged when firms that are diversified in the base year, but not at the time of takeover, are excluded.

Table III

Logit Regressions Relating Takeover Likelihood to Excess Value and Other Firm Characteristics

The sample includes 2,277 observations of diversified firms from fiscal years 1984 and 1987, and 1,836 observations of firms reporting one segment in these years. The top number for each variable is the parameter estimate, the middle number is the elasticity, and two-tailed *p*-values are in parentheses. All independent variables are measured in the observation's base year (1984 or 1987). Variable definitions are as follows. The asset and sales multiplier measures of excess value are as defined in Table II. Return on assets is the ratio of net income before extraordinary items and discontinued operations to total assets. Size is the log of total assets. Liquidity is the ratio of net liquid assets to total assets. Book/market ratio is book value of equity over market value of common equity. Number of segments is the number of segments listed by the firm on the COMPUSTAT Industry Segment database. Sales growth is the annual rate of change in sales. Leverage is the ratio of debt to assets. The elasticities for the explanatory variables are defined as the percentage increase in the probability of takeover above the evaluation point (see definition below) when the variable's median is replaced with either its 25th or 75th percentile (whichever leads to a probability increase). The probability of takeover at the evaluation point is defined as the probability of takeover at the point on the cumulative logistic distribution that results when all of the explanatory variables have their median values.

Sample	All	All	1984	1984	1987	1987
Observations = 0, no takeover	2673	2966	1221	1357	1452	1609
Observations = 1, takeover	554	618	323	370	231	248
Probability of takeover at evaluation point	18.580	18.045	22.309	22.577	14.792	13.498
Intercept	-1.369 ^a (0.000)	-1.497 ^a (0.000)	-1.067 ^a (0.000)	-1.203 ^a (0.000)	-1.676 ^a (0.000)	-1.791 ^a (0.000)
Excess value, asset multiplier for multisegment firms	-0.566 ^a 2.076 (0.004)		-0.428 ^c 1.874 (0.090)		-0.742 ^b 2.086 (0.021)	
Excess value, asset multiplier for single-segment firms	-0.363 ^b 1.470 (0.031)		-0.133 0.566 (0.554)		-0.618 ^b 2.239 (0.018)	
Excess value, sales multiplier for multisegment firms		-0.384 ^a 2.140 (0.002)		-0.396 ^a 2.468 (0.010)		-0.386 ^c 1.800 (0.055)
Excess value, sales multiplier for single-segment firms		-0.182 1.093 (0.151)		-0.221 1.548 (0.210)		-0.198 0.943 (0.279)
Return on assets	1.274 ^b 0.660 (0.017)	1.012 ^b 0.737 (0.042)	1.012 0.703 (0.156)	0.803 0.677 (0.228)	1.383 ^c 0.528 (0.099)	0.940 0.547 (0.220)
Size	-0.112 ^a 2.046 (0.001)	-0.088 ^a 1.559 (0.004)	-0.096 ^b 2.010 (0.029)	-0.076 ^c 1.594 (0.064)	-0.103 ^b 1.558 (0.034)	-0.068 0.941 (0.138)
Liquidity	0.261 0.399 (0.277)	0.267 0.399 (0.256)	0.576 ^c 0.986 (0.093)	0.611 ^c 1.056 (0.063)	-0.009 0.013 (0.980)	0.015 0.018 (0.966)
Book/market ratio	-0.058 0.246 (0.529)	0.062 0.338 (0.419)	-0.111 0.571 (0.379)	-0.018 0.093 (0.865)	-0.025 0.089 (0.858)	0.118 0.473 (0.305)
Number of segments	0.039 0.597 (0.341)	0.015 0.223 (0.693)	0.062 1.093 (0.230)	0.041 0.725 (0.395)	-0.076 0.984 (0.288)	-0.121 ^c 1.476 (0.075)
Sales growth	-0.275 ^b 0.377 (0.027)	-0.244 ^b 0.327 (0.040)	-0.492 ^b 0.734 (0.014)	-0.352 ^b 0.528 (0.050)	-0.092 0.116 (0.560)	-0.145 0.170 (0.374)
Leverage	0.709 ^a 1.464 (0.005)	0.673 ^a 1.358 (0.005)	0.736 ^b 1.721 (0.041)	0.770 ^b 1.817 (0.027)	0.935 ^a 1.632 (0.010)	0.865 ^b 1.396 (0.013)

^{a,b,c} denotes that the coefficient estimate is significantly different from zero at the 0.01, 0.05, and 0.10 two-tailed probability level, respectively.

multi-segment company value loss coefficient estimates are significant at the 0.05 level using the conservatively adjusted standard errors.

The effect of value destruction on takeover likelihood appears to be important economically as well as statistically. For the full sample, changing the diversified firm asset (sales) multiplier measure of excess value from its median to its 25th percentile increases the acquisition probability by 2.1 percent (2.1 percent) from its evaluation point of 18.6 percent (18 percent). Consistent with Palepu (1986), the only control variables significant at the 0.10 level in more than half of the regressions are size, growth, and leverage. Leverage's positive effect is, however, opposite in direction to that found by Palepu for the 1971–1979 period. Palepu did not hypothesize a directional relation between leverage and takeover probability, but subsequent theoretical papers by Stulz (1988) and Israel (1991) predict that leverage is negatively related to takeover probability. Our findings do not provide empirical support for this prediction during the 1985–1991 period, although, as Harris and Raviv (1991, p. 325) caution, these and related theoretical papers “should be viewed as theories of short-term changes in capital structure taken in response to imminent takeover threats” The size and leverage control variables appear to have economically important effects on takeover probability. For the asset (sales) multiplier estimation using the full sample, the elasticities of takeover likelihood with respect to size and leverage are 2 percent (1.6 percent), and 1.5 percent (1.4 percent).

The binomial logits show that variation in value destruction is always significantly related to takeover likelihood within multi-segment businesses, but has at most a marginally greater effect on takeover probability within the diversified sample than it does in the single-line sample. It is important, however, to incorporate the fact that the average level of value destruction is much larger in diversified firms than in stand-alone companies (Berger and Ofek (1995)). Allowing for the greater value destruction of diversified firms requires separately comparing multi-segment targets to all nontargets and single-line targets to all nontargets. We therefore use multinomial logits to incorporate the large average difference in value destruction into the assessment of the effect of value destruction on the takeover probability of diversified versus stand-alone firms.

Table IV presents the results. Observations are assigned a value of zero if the firm is not taken over, and one (two) if the firm is one-segment (multi-segment) and is taken over. The nontakeover group again includes both stand-alone and diversified firms. Two columns of results are reported for each estimation. The first column (stand-alone targets) provides information on the impact of the independent variables on the likelihood of takeover for single-segment firms relative to the non-takeover group, whereas the second column (multi-segment targets) reports the independent variables' effect on takeover likelihood for multi-segment firms relative to the nontakeover group. Panel A presents results using the asset multiplier measure of excess value, whereas Panel B reports results using the sales multiplier measure.

Table IV

Multinomial Logit Regressions Relating Takeover Likelihood to Excess Value and Other Firm Characteristics

The sample includes 2,277 observations of diversified firms from fiscal years 1984 and 1987, and 1,836 observations of firms reporting one segment in these years. The top number for each variable is the parameter estimate, the middle number is the elasticity, and two-tailed *p*-values are in parentheses. All independent variables are measured in the observation's base year (1984 or 1987). Variable definitions are as follows. The asset and sales multiplier measures of excess value are as defined in Table II. Return on assets is the ratio of net income before extraordinary items and discontinued operations to total assets. Size is the log of total assets. Liquidity is the ratio of net liquid assets to total assets. Book/market ratio is book value of equity over market value of common equity. Sales growth is the annual rate of change in sales. Leverage is the ratio of debt to assets. The elasticities for the explanatory variables are defined as the percentage increase in the probability of takeover above the evaluation point (see definition below) when the variable's median is replaced with either its 25th or 75th percentile (whichever leads to a probability increase). The probability of takeover at the evaluation point is defined as the probability of takeover at the point on the cumulative logistic distribution which results when all of the explanatory variables have their median values. The line labeled *Significance of multiplier diff.* provides the two-tailed probability level that the coefficient estimate on the excess value variable for single-segment firms is significantly different from the estimate for multi-segment firms.

Panel A: Multinomial Logit Estimation of Takeover Probability, with Asset Multiplier

Sample	All		1984		1987	
	Single seg	Multiseg	Single seg	Multiseg	Single seg	Multiseg
Observations = 0, no takeover	2673		1221		1452	
Observations = 1 or 2, takeover	271	283	136	187	135	96
Probability of takeover at evaluation point	10.215	10.377	11.557	14.195	9.032	6.779
Intercept	-0.881 ^a (0.002)	-3.224 ^a (0.000)	-0.587 (0.155)	-2.575 ^a (0.000)	-1.197 ^a (0.003)	-4.174 ^a (0.000)
Excess value, asset multiplier	-0.170 0.413 (0.373)	-0.816 ^a 1.904 (0.000)	0.031 0.095 (0.905)	-0.554 ^b 1.812 (0.021)	-0.388 0.902 (0.171)	-1.162 ^a 1.725 (0.001)
Return on assets	0.492 0.250 (0.435)	2.738 ^a 1.167 (0.001)	0.977 0.598 (0.292)	1.240 0.682 (0.201)	0.036 0.016 (0.968)	4.625 ^a 1.446 (0.003)
Size	-0.306 ^a 2.804 (0.000)	0.060 ^c 0.847 (0.096)	-0.340 ^a 3.440 (0.000)	0.085 ^c 1.579 (0.069)	-0.274 ^a 2.234 (0.000)	0.044 0.436 (0.471)
Liquidity	0.691 ^b 0.785 (0.025)	-0.259 0.221 (0.432)	1.149 ^b 1.462 (0.014)	0.033 0.034 (0.939)	0.368 0.363 (0.389)	-0.540 0.326 (0.347)
Book/market ratio	-0.159 0.427 (0.241)	0.066 0.215 (0.562)	-0.208 0.603 (0.289)	0.008 0.034 (0.957)	-0.118 0.278 (0.527)	0.112 0.238 (0.542)
Sales growth	-0.059 0.057 (0.673)	-0.712 ^a 0.576 (0.002)	-0.312 0.328 (0.194)	-0.743 ^b 0.747 (0.017)	0.106 0.170 (0.532)	-0.687 ^c 0.396 (0.059)
Leverage	0.864 ^a 1.236 (0.008)	0.616 ^c 0.704 (0.074)	1.106 ^b 1.631 (0.023)	0.471 0.736 (0.312)	0.852 ^c 1.148 (0.062)	1.139 ^b 0.831 (0.031)
Significance of multiplier diff.	(0.013)		(0.080)		(0.074)	

Table IV (continued)

Panel B: Multinomial Logit Estimation of Takeover Probability, with Sales Multiplier						
Sample	All		1984		1987	
	Single seg	Multiseg	Single seg	Multiseg	Single seg	Multiseg
Observations = 0, no takeover	2996		1357		1609	
Observations = 1 or 2, takeover	266	352	133	237	133	115
Probability of takeover at evaluation point	9.124	11.148	10.340	15.720	8.107	6.861
Intercept	-1.045 ^a	-3.004 ^a	-0.689 ^c	-2.426 ^a	-1.421 ^a	-3.782 ^a
	(0.000)	(0.000)	(0.095)	(0.000)	(0.000)	(0.000)
Excess value, sales multiplier	0.084	-0.607 ^a	0.091	-0.599 ^a	0.059	-0.629 ^a
	0.247	2.360	0.043	2.924	0.153	1.688
	(0.526)	(0.000)	(0.622)	(0.000)	(0.755)	(0.003)
Return on assets	0.714	1.498 ^b	1.035	0.593	0.417	2.102 ^c
	0.330	0.665	0.576	0.351	0.170	0.633
	(0.262)	(0.033)	(0.259)	(0.489)	(0.649)	(0.088)
Size	-0.332 ^a	0.071 ^b	-0.368 ^a	0.080 ^c	-0.295 ^a	0.079
	2.786	1.073	3.423	1.609	2.202	0.810
	(0.000)	(0.031)	(0.000)	(0.057)	(0.000)	(0.155)
Liquidity	0.378	0.216	0.765 ^c	0.557	0.069	0.002
	0.382	0.186	0.869	0.628	0.061	0.001
	(0.230)	(0.494)	(0.099)	(0.182)	(0.880)	(0.997)
Book/market ratio	-0.006	0.136	-0.129	0.058	0.098	0.165
	0.014	0.477	0.337	0.273	0.254	0.357
	(0.959)	(0.151)	(0.460)	(0.636)	(0.526)	(0.284)
Sales growth	-0.014	-0.648 ^a	-0.251	-0.487 ^c	0.141	-0.991 ^a
	0.012	0.557	0.239	0.528	0.206	0.585
	(0.920)	(0.002)	(0.284)	(0.056)	(0.397)	(0.009)
Leverage	0.756 ^b	0.665 ^b	0.964 ^c	0.669	0.722	1.047 ^b
	0.972	0.810	1.282	1.146	0.875	0.769
	(0.022)	(0.035)	(0.053)	(0.124)	(0.120)	(0.028)
Significance of multiplier diff.	(0.000)		(0.002)		(0.012)	

^{a,b,c} denotes that the coefficient estimate is significantly different from zero at the 0.01, 0.05, and 0.10 two-tailed probability level, respectively.

In both panels, the excess value measures have significantly more impact on takeover likelihood for diversified than for stand-alone firms. Because all six sets of results in Table IV are similar, we focus on those for the full sample using the asset multiplier measure of excess value. These results, presented in the first two columns of Panel A, show that the coefficient estimate of -0.816 on excess value for the multi-segment targets is significant at the 0.01 level, whereas the corresponding estimate of -0.170 for the stand-alone targets does not differ significantly from zero. Thus, value loss significantly affects the probability that an observation is a diversified target rather than a (diversified or stand-alone) nontarget, but does not significantly affect the probability that an observation is a stand-alone target rather than a nontarget. Moreover, a chi-squared test for the equality of the coefficient estimates on the excess value variable between the multi-segment targets and the stand-alone targets, reported in the bottom row of Table IV, is significant at the 0.05 level. This result

shows that the effect of value loss on the probability of being a target firm is significantly greater when comparing diversified targets to all nontargets than it is when comparing stand-alone targets to all nontargets. This result indicates that it is not merely value loss per se that increases takeover likelihood among the sample of diversified firms, but rather value loss *associated with the diversification discount*.

The other five estimations reported in Table IV provide results very similar to those for the full sample using the asset multiplier. Excess value is always the economically most important variable for the multi-segment targets, and it is never so for the stand-alone targets. The coefficient estimates on the control variables generally have the same sign for both the stand-alone targets and the multi-segment targets. One exception is the size variable, which is always signed negatively for the former group and positively for the latter. The positive sign for the multi-segment targets reflects the inclusion of the naturally smaller stand-alone firms in the nontakeover group.

The combined results from Tables III and IV provide support for both value destruction in general, and *value loss associated with diversification policy* affecting takeover probabilities for diversified firms. Because value loss and diversification policy are correlated, it is impossible to completely disentangle the extent to which general versus diversification-specific value destruction is affecting takeover likelihood. The Table III results cannot reject the hypothesis that general value loss alone affects the probability of takeover, but these tests make no attempt to address the correlation between the level of value loss and whether the firm is diversified. The Table IV results strongly support diversification-specific value loss affecting takeover likelihood, but these tests may over-adjust for the correlation between value destruction and diversification by comparing each type of target (diversified and stand-alone) to all nontargets.

We corroborate the evidence from the multinomial logits by examining whether diversification increases the probability of takeover, after controlling for other determinants. Diversification is measured by an indicator variable set to one if the firm has multiple segments, and to zero otherwise. The control variables are the same ones used in Tables III and IV. We perform estimations for the full, 1984, and 1987 samples. Consistent with the hypothesis that diversification provides acquirers with more opportunity to profit from value creation, the diversification indicator is significantly positively (0.05 level) related to takeover likelihood for the full and the 1984 samples (results not reported in a table). Our evidence extends univariate results presented by Comment and Jarrell (1995). They find that, among firms with a market capitalization above \$500 million, the annual takeover rate among multi-segment firms is 2.6 percent, versus only 1.7 percent for their single-line counterparts.

B. LBOs Versus Other Acquirers of Diversified Targets

Although the results in Tables III and IV show that acquirers tend to target diversified firms in which more value can be added through breakup, we do not

know whether acquirers actually breakup, or otherwise enhance the value of, their targets. Therefore, we turn to an examination of the LBO acquirers, which have been argued to be particularly likely to undertake value-enhancing actions. For example, Jensen (1989) argues that the management, compensation, and financial structures of LBO associations lead to efficiency gains and high-return asset sales. He views high leverage as an important LBO advantage, in part because the need to service debt increases the incentive to produce cash by selling assets. Empirical evidence provides support for the preceding arguments. Kaplan (1989) documents the high frequency with which LBOs break-up targets. He notes that 16 of 42 sample LBOs make divestitures (or acquisitions) of at least 10 percent of the buyout capital within one year of the LBO.⁶ Bhagat, Shleifer, and Vishny (1990) provide evidence that divestitures are more common following LBO acquisitions than non-LBO takeovers. They find that the median portion of the acquisition price realized through selloffs is 40.7 percent following the seven LBO buyouts in their sample versus 12.3 percent for the 55 non-LBO acquisitions.

Table V presents, for the diversified firms subsequently taken over, estimations of the likelihood their takeover was by an LBO group. The only control reported is growth, which is the only control variable consistently significant in the Table V regressions. The Table V estimations are similar across both excess value measures, with the signs of the excess value coefficient estimates negative in all six estimations, and significant at the 0.01 (0.10) level using the asset (sales) multiplier for the full and the 1987 samples. Significance levels for the full sample continue to exceed the 0.01 (0.10) level when we use the conservatively adjusted standard errors. Finally, when (unreported) regressions using the same variables as those in Table V are performed on the sample of one-segment firms subsequently taken over, the estimates on the excess value variables are not consistent in sign and are never significant at the 0.10 level.

The elasticities also suggest that value destruction has an economically significant effect on the conditional probability that, given takeover, the acquirer is an LBO. For the full sample of takeovers, decreasing the asset (sales) multiplier measure of excess value from its median to its 25th percentile increases takeover probability by 3.9 percent (3 percent) from its evaluation point of 10.1 percent (12.1 percent). Comparing the 1984 and 1987 samples, it is apparent that the economic impact of value destruction on the likelihood the acquirer is an LBO is greater in the later period. The 8.1 percent elasticity on the asset multiplier measure in 1987 is particularly striking. The smaller elasticities for the 1984 sample, and their lack of significance (at the 0.10 level), are consistent with three possible explanations. First, there is less likelihood that the value losses of 1987 firms change drastically prior to the

⁶ Jensen (1993) contends that LBOs are more likely than other acquirers to take other value-increasing actions in addition to break-ups. For example, he notes that LBO associations are characterized by limited partnership agreements that prohibit headquarters from cross-subsidizing one division with cash from another.

Table V

Logit Regressions Relating the Likelihood of LBO Versus Non-LBO Takeover to Excess Value and Sales Growth

The sample includes all observations with two or more segments on the COMPUSTAT Industry Segment database in 1984 or 1987 that were taken over during the four fiscal years following the observation year. The top number for each variable is the parameter estimate, the middle number is the elasticity, and two-tailed *p*-values are in parentheses. All independent variables are measured in the observation's base year (1984 or 1987). Variable definitions are as follows. The asset and sales multiplier measures of excess value are as defined in Table II. Sales growth is the annual rate of change in sales. The elasticities for the explanatory variables are defined as the percentage increase in the probability of takeover above the evaluation point (see definition below) when the variable's median is replaced with either its 25th or 75th percentile (whichever leads to a probability increase). The probability of takeover at the evaluation point is defined as the probability of takeover at the point on the cumulative logistic distribution which results when all of the explanatory variables have their median values.

Dependent variable LBO logit Sample	All	All	1984	1984	1987	1987
Observations = 0, no LBO	249	309	170	211	79	98
Observations = 1, LBO	39	49	18	27	21	22
Probability of takeover at evaluation point	10.068	12.079	7.077	9.847	14.607	16.014
Intercept	-2.819 ^a (0.000)	-2.323 ^a (0.000)	-3.103 ^a (0.000)	-2.525 ^a (0.000)	-2.483 ^a (0.000)	-2.050 ^a (0.000)
Excess value, asset multiplier	-1.496 ^a 3.862 (0.005)		-1.068 2.171 (0.129)		-2.237 ^a 8.109 (0.007)	
Excess value, sales multiplier		-0.567 ^c 2.989 (0.060)		-0.426 1.705 (0.276)		-0.840 ^c 6.592 (0.086)
Sales growth	2.816 ^a 2.353 (0.000)	1.507 ^a 1.410 (0.004)	2.772 ^a 1.734 (0.010)	1.520 ^b 1.221 (0.010)	2.896 ^b 3.281 (0.010)	1.684 ^c 1.983 (0.088)

^{a,b,c} denotes that the coefficient estimate is significantly different from zero at the 0.01, 0.05, and 0.10 two-tailed probability level, respectively.

LBO date than is true for 1984 companies. Table I shows that all but one of the LBOs of 1987 firms occurs within two years of the measurement of value loss, whereas most of the LBOs of 1984 firms do not occur within two years. Second, the elasticities in 1987 must be about twice as high as those in 1984 in order to provide an equal proportional increase in takeover probability. This is so because the probability of takeover at the evaluation point is about twice as high in 1987 as in 1984, but this explanation can only partially explain the fact that the elasticities are roughly four times as large in 1987. A final possibility is that LBOs became more likely to make break-up acquisitions, rather than strategic ones, in the late 1980s. This possibility is intriguing, since Kaplan and Stein (1993) show that the ratio of buyout price to target fundamentals (as

measured by cash flow) rose significantly in the late 1980s. They comment that such a pattern is consistent with an "overheating phenomenon" in the buyout market. Our evidence suggests that some of the apparent overpayment in later LBOs could reflect an increased emphasis on taking extreme value-destroying firms private.

III. Value Loss from Diversification and Subsequent Breakup

A. Value Destruction and Post-Takeover Breakup

The preceding analysis suggests that takeovers of diversified firms often lead to breakups. To provide evidence on this issue, and to examine the difference between targets that are broken up and those that are not, we document the post-takeover sales of target assets following large acquisitions. We define large acquisitions as those in which the target's pre-takeover total capital exceeded \$250 million. We also require the targets to have complete information available for calculating both excess value measures.

We obtain information on post-takeover divestitures from the IDDMA file and the PR Newswire M&A file of the Lexis/Nexis database. We gather information on the number of target divisions divested in the acquisition year plus the two following years and, when available, the value of the consideration received for the divested divisions. Post-takeover information is typically disseminated for the merged firm, making attribution of sold-off divisions to the target difficult. We label a post-takeover selloff as a breakup of the target's divisions only when the division sold is described as having been a part of the target. This conservatism, and the tendency for reporting on selloffs to be incomplete, mean that the selloffs we document are likely to underestimate the amount of post-takeover divestiture activity.

Panel A of Table VI provides comparisons of the value destruction in targets subsequently broken up and those not broken up. Some of the 1988 targets enter both the 1984 and 1987 base year samples, and therefore have two value destruction measures. We eliminate these cases of double-counting by deleting the 1987 measure of target excess value when the takeover announcement occurs during the first three months of 1988 and the 1984 measure of target excess value otherwise.⁷

We define a bustup as occurring when the number of divested divisions is either: 1) at least three, or 2) at least one less than the number of segments reported by the target on the CIS database in the base year. The Panel A results show a striking difference in the value loss between targets that are broken up and those that are not. Measuring excess value with the asset multiplier, the mean value loss of 20.8 percent for the 50 targets subsequently broken up exceeds the value loss for the 50 targets not broken up by 16.2

⁷ Table VII shows that target stock prices three months prior to the takeover announcement are much smaller than the final purchase price. This evidence is consistent with excess value measures for a given year not being distorted by a following year takeover as long as the takeover occurs at least three months into the following year.

Table VI

The Relation Between Excess Value and Post-Takeover Bust-Up

The sample consists of 100 large, diversified firms that were taken over. Panel A groups the sample into targets that were busted-up after takeover and those that were not. In this panel, we define a bustup as occurring when the number of divested divisions is either: 1) at least three, or 2) at least one less than the number of segments reported by the target on the COMPUSTAT Industry Segment database in the base year. Panel B uses a continuous measure of the extent of post-takeover breakup: the proportion of the target's acquisition value that was subsequently divested. The asset and sales multiplier measures of excess value are as defined in Table II. The divestitures with value/total variable in Panel B is a control for the proportion of the firm's divestitures for which values are reported. If the firm has no divestitures (i.e., the denominator is zero), the ratio is set equal to one.

Panel A: Value Loss for Firms Later Busted-up Versus Those Not Busted-up						
Excess Value	Means			Medians		
	No Bustup	Bustup	Difference	No Bustup	Bustup	Difference
Asset multiplier	-0.046	-0.208	-0.162 ^b	-0.059	-0.226	-0.167 ^b
Sales multiplier	-0.045	-0.367	-0.322 ^a	0.043	-0.367	-0.410 ^a
Number of segments	3.5	3.5	0.0	3.0	3.0	0.0
Observations	50	50		50	50	

Panel B: Regressions of the Proportion of Target's Value Subsequently Divested on the Excess Value Measures		
Dependent Variable	Minimum Value Divested/Acquisition Price	
Observations	100	100
Adj R^2	0.080	0.073
Intercept	0.055 (0.860)	0.055 (0.849)
Excess value, asset multiplier	-0.192 ^b (0.031)	
Excess value, sales multiplier		-0.127 ^b (0.048)
Divestitures with value/total	0.218 ^b (0.011)	0.216 ^b (0.012)

^{a,b} denotes, in Panel A, that the mean (median) difference is significantly different from zero at the 0.01 and 0.05 two-tailed probability level, respectively. In Panel B, denotes that the coefficient estimate is significantly different from zero at the 0.01, and 0.05 two-tailed probability level, respectively.

percent. With the sales multiplier, the broken up targets have a mean value loss of 36.7 percent, and the remaining targets have a mean value loss of 4.5 percent. These results are consistent with breakup takeovers targeting value-destroying firms and strategic takeovers targeting relatively better-performing diversified companies.

Absent measurement error, a more powerful test of the relation of value loss to post-takeover divestitures is achieved by using a continuous measure of the value of such divestitures. In Panel B of Table VI, we construct such a measure by summing, for each target, all available selling prices of the divested divi-

sions, then dividing this total by the purchase price the bidder paid for the target. The resulting ratio measures the proportion of the target's value for which information on values divested by the bidder is available. Unfortunately, of the 234 target divisions we know were divested by bidders in the two years following the acquisitions, just 124 have information about the value of the divisions sold. There is thus considerable measurement error in using the ratio we construct to proxy for the proportion of target value subsequently divested.

We regress the ratio of minimum value divested to acquisition price on excess value and a control for the proportion of the firm's divestitures for which values are reported.⁸ We find that, using both measures of excess value, a greater portion of the acquisition price is divested when the target is destroying more value. The coefficient estimates on the excess value measures are significant at better than the 0.05 level in both regressions. Even with the large amount of noise in our proxy, we still find that firms destroying more value have a greater portion of their assets divested after takeovers.

Table VII provides details on the sample of 100 large acquisitions used in the Table VI tests. The second and third columns provide the takeover announcement date (i.e., the date of the first bid by the bidder who gained control of the target) and the purchase price of the target's equity. The information in these columns demonstrates that the sample of large acquisitions has some differences from the remainder of our sample. For example, eight of the 100 takeovers are announced in 1990, and three in 1991. Thus, 11 percent of the large acquisitions occur in these two years, versus 7.2 percent for the full sample.

The premiums paid by the acquirers, defined as the final equity purchase price divided by the target's market value of equity three months before the takeover announcement, range from -1.4 percent for Ausimont N.V. to 379.5 percent for GCA Corp., with an average of 58.8 percent. These premia are slightly larger than those previously documented for takeovers during the 1980s (see Jensen (1991)). The number of target divisions divested by the acquirer by the end of the second year after acquisition ranges from zero to 15, with an average of 2.3. Twenty-six of the 50 acquisitions we classify as non-bustups have no divested divisions, whereas the remaining 24 have one or two divisions divested. In those cases where one or more divested divisions had a disclosed selling price, the value of divested assets as a portion of the target's purchase price ranged from 0.6 percent for Contel to 155.2 percent for Stauffer Chemical, with an average of 42.5 percent. These figures are similar to those reported by Bhagat, Shleifer, and Vishny (1990), who report a range of 0.4 percent to 131.8 percent, with an average of 43.7 percent. Their measurement differs slightly from ours, in that they include the value of acquired debt in

⁸ If the firm has no divestitures (i.e., the denominator of the control variable is zero), the ratio is set equal to one. If we instead set the ratio to zero for these cases, the significance of the coefficient estimate on the control variable is increased, but our inferences on the excess value variables remain unchanged.

Table VII
Summary of 100 Takeovers of Large, Diversified Firms

The sample consists of 100 large, diversified firms that were taken over. The information referred to by each column heading is as follows. Target refers to the name of the firm taken over. Announced refers to the announcement day of the first bid by the bidder who gained control over the target. Purchase price is the final price per share offered by the bidder multiplied by the number of shares outstanding. Premium is the excess of the final purchase price over the stock price three months before the announcement. Divest refers to the number of divisions divested from the target in the year of the acquisition and the following two years. Min val divested is the total value divested for divisions whose sale price is reported, divided by the purchase price of the target. Selloffs w/ value reports the number of divisions divested with available selling prices. Segn refers to the number of segments reported by the firm in the year its excess value is measured.

Target	Announced	Purchase Price	Premium	Divest	Min Val Divested	Selloffs w/ Value	Segn
A G S COMPUTERS INC	880613	407	82.35%	2	23.6%	1	2
A M F INC	850426	631	48.8%	9	82.4%	5	7
ADOBE OIL & GAS CORP	850214	284	7.58%	2	23.6%	2	3
AMERICAN BROADCASTING COS	850319	3517	91.7%	0	0.0%	0	4
AMFAC INC	880127	834	81.5%	7	67.3%	7	7
AMSTED INDUSTRIES INC	851104	512	3.33%	5	0.0%	0	4
ANCHOR HOCKING CORP	861106	337	1.19%	1	0.0%	0	3
ASAMERA INC	880226	375	63.23%	2	10.1%	1	3
ASSOCIATED DRY GOODS CORP	860623	1908	45.4%	4	34.6%	2	2
AUSIMONT N V	880928	640	-1.4%	3	27.2%	1	2
BECOR WESTERN INC	870217	280	34.65%	1	43.2%	1	3
BIG THREE INDS INC	860813	1093	13.2%	1	0.0%	0	3
BLAIR JOHN & CO	860601	251	47.62%	4	143.7%	3	5
C N W CORP	890606	814	28.2%	0	0.0%	0	3
C P NATIONAL CORP	880725	315	60.19%	1	27.0%	1	5
CAMPBELL RED LAKE MINES LT	870606	NA	NA	0	0.0%	0	2
CATALYST ENERGY DEV CORP	880726	189	23.3%	1	0.0%	0	3
CENTRAL SOYA INC	850314	342	45.86%	4	31.6%	3	3
CESSNA AIRCRAFT CO	850916	592	31.9%	0	0.0%	0	2
CHESEBROUGH PONDS INC	861201	2478	63.8%	9	88.1%	4	9
CHICAGO PACIFIC CORP	881025	562	27.3%	1	37.9%	1	2
CHIEFTAIN DEVELOPMENT LTD	880608	230	43.12%	0	0.0%	0	3
COLEMAN INC	890320	521	80.49%	4	15.0%	2	2
COLLINS & AIKMAN CORP	861110	1155	42.76%	1	0.0%	0	3
CONTEL CORP	900712	6191	58.3%	5	0.6%	1	3
COX COMMUNICATION INC	850409	2116	37.3%	2	7.3%	2	4
DAY INTERNATIONAL	870707	359	64.81%	1	10.3%	1	4
DENNISON MANUFACTURING CO	900525	497	43.8%	2	0.0%	0	4
DIVERSIFIED ENERGIES INC	900730	665	46.0%	4	18.3%	3	4
DIVERSIFOODS INC	850521	388	17.95%	2	25.8%	1	4
DOVE MINES LTD	870506	NA	NA	0	0.0%	0	2
DOVE-PETE-LTD	870414	504	97.3%	1	33.5%	1	2
EMHART CORP VA	890320	2479	74.9%	3	22.6%	3	5
ENTEX INC	871005	497	37.5%	0	0.0%	0	4
FIRESTONE INC	880307	2849	154.0%	0	0.0%	0	2
GCA CORP	880302	91	379.50%	1	8.8%	1	3
GELCO CORP	871005	247	55.6%	0	0.0%	0	3
GENERAL FOODS CORP	850925	5722	48.1%	0	0.0%	0	4
GIFFORD HILL & CO INC	860909	274	38.38%	1	22.2%	1	3
GRAPHIC SCANNING CORP	901231	168	33.68%	2	5.4%	2	6
GREAT NORTHERN NEKOOSA	891030	3596	64.4%	0	0.0%	0	4
GROLIER INC	880311	474	169.44%	3	11.0%	1	2
HAMMERMILL PAPER CO	860812	1000	56.4%	0	0.0%	0	5

Table VII (continued)

Target	Announced	Purchase Price	Premium	Divest	Min Val Divested	Selloffs w/ Value	Segn
HARCOURT BRACE JOVANOVIH	910808	55	20.0%	1	0.0%	0	3
HOLLY FARMS CORP	881011	1222	83.01%	4	40.9%	3	4
HOOVER UNIVERSAL	850304	489	61.33%	3	44.4%	1	3
HUGHES TOOL CO	861022	653	53.4%	4	0.0%	0	2
INEXCO OIL CO	860513	138	87.7%	0	0.0%	0	2
JP INDUSTRIES	900326	186	37.03%	0	0.0%	0	2
JEPSON CORP	890727	226	14.29%	2	24.8%	1	3
KAISERTECH LTD DEL	880524	868	63.1%	3	6.3%	1	3
KOPPERS CO	880302	1659	93.7%	10	40.1%	6	3
KRAFT INC NEW	881017	13905	95.8%	4	0.0%	0	3
LEAR SIEGLER INC	861217	1049	9.7%	2	48.3%	1	3
LEASEWAY TRANSPORTATION CO	861113	602	11.8%	3	0.0%	0	5
LIQUID AIR CORP NORTH AMER	880226	466	60.9%	0	0.0%	0	2
LOWENSTEIN M CORP	851008	263	32.63%	0	0.0%	0	3
LUCKY STORES INC	880323	2509	146.4%	1	0.0%	0	3
MCA INC	900924	4849	18.9%	0	0.0%	0	7
MACMILLAN INC	880721	2236	67.1%	7	24.1%	6	5
MAGIC CHEF INC	860324	723	40.52%	2	0.0%	0	3
MANPOWER INC NEW	870803	1329	67.51%	2	4.1%	2	2
MOHASCO CORP	880509	508	46.73%	2	54.5%	2	3
MOORE MC CORMACK RES INC	880223	356	141.2%	2	60.7%	2	7
NABISCO BRANDS INC	850530	4929	56.7%	4	4.1%	1	4
NATIONAL CAN CORP	850319	401	33.86%	0	0.0%	0	3
NEW WORLD ENTERTAINMENT LTD	890410	94	211.30%	1	0.0%	0	2
NORTH AMERN PHILIPS CORP	870818	1624	31.8%	4	0.0%	0	5
NORTON CO	900425	1883	66.3%	1	0.0%	0	2
PACIFIC LUMBER CO	851001	866	39.1%	1	34.6%	1	3
PACIFIC RESOURCES INC HI	890106	327	42.06%	0	0.0%	0	2
PENNWALT CORP	890320	1042	28.0%	1	0.0%	0	3
PHILIPS INDUSTRIES INC	900605	527	23.3%	0	0.0%	0	5
PILLSBURY CO	881003	5688	80.2%	11	16.7%	5	2
PULLMAN COMPANY DE NEW	880708	380	51.02%	7	33.7%	4	4
PUROLATOR COURIER CORP	870331	306	45.45%	3	94.9%	3	2
REICHOLD CHEMICALS INC	870624	447	27.32%	1	0.0%	0	2
REVLON INC	850815	2214	43.2%	15	135.3%	9	5
RICHARDSON VICKS INC	851001	1611	89.0%	4	0.0%	0	2
ROLLINS COMMUNICATIONS INC	860513	599	50.46%	0	0.0%	0	3
SCM CORP	850822	738	55.8%	4	108.8%	4	6
SAGA CORP	860508	497	47.7%	2	60.3%	1	3
SANDERS ASSOC INC	860710	1175	90.5%	0	0.0%	0	2
SMITHKLINE BECKMAN CORP	890331	7818	30.9%	1	0.0%	0	4
SOUTHWEST FOREST INDS INC	870128	396	88.3%	1	56.8%	1	3
SQUARE D CO	910219	2067	85.3%	4	1.0%	1	2
STALEY CONT'L INC	880407	1075	66.9%	0	0.0%	0	2
STAUFFER CHEM CO	850220	1218	69.7%	6	155.2%	5	5
STEVENS J P & CO INC	880301	1108	136.2%	6	75.3%	4	5
TW SVCS INC	881007	1651	82.6%	3	1.8%	1	3
TAFT BROADCASTING CO	870415	1446	36.5%	1	0.0%	0	3
TELEX CORP	871208	910	20.1%	1	0.0%	0	2
TEXAS EASTERN CORP	890217	2824	82.0%	4	67.3%	4	6
TIGER INTL INC	881219	740	54.6%	0	0.0%	0	2
TRANSWAY INTERNATIONAL CORP	851001	316	49.42%	0	0.0%	0	4
UNITED ARTISTS ENTRMT CO	910501	1206	26.3%	0	0.0%	0	3
WALKER HIRAM RES LTD	860319	2038	17.8%	3	152.6%	3	3
WESTBURNE INTERNATIONAL INDS L	870121	175	24.07%	1	0.0%	0	9
WHITE CONS INDS INC	860303	741	35.3%	2	1.6%	1	2
XIDEX CORP	880712	373	54.17%	1	0.0%	0	3

calculating both their acquisition prices and the proceeds from the disposition of divested units, whereas we exclude acquired debt from both calculations.

B. Who are the Buyers in Post-Takeover Breakups?

If breakup takeovers restore value by reorganizing segments of diversified firms as stand-alone entities, then the buyers of the divisions divested from a diversified firm after takeover will tend to be LBOs or other firms likely to operate the division as a stand-alone unit. To provide evidence on this issue, we examine the buyers of all of the divisions divested by the acquirers of the 100 large targets.

For the 227 divisions we know were divested by these acquirers, we classify the buyer's relation to the divested division based on the descriptions of their lines of business in the IDDMA file and/or the PR Newswire M&A file of Lexis/Nexis. We are unable to apply an SIC code algorithm because many of the buyers are either foreign or are not publicly traded. Buyers are categorized into the following types: LBOs, related focused, related diversified, unrelated focused, unrelated diversified, spinoffs/equity carve-outs, and unnamed.⁹ All acquisition groups are classified as LBOs, the adjective related is applied instead of unrelated if the main line of business of the divested division is related horizontally or vertically to a line of business of the buyer, and the adjective focused is applied instead of diversified if the buyer has one main line of business only. The categorizations of buyers as related/unrelated and focused/diversified are thus a function of our interpretation of Lexis/Nexis information. We find that the number of buyers in each group is as follows: 67 LBOs, 80 related focused, 46 related diversified, five unrelated focused, one unrelated diversified, five spinoffs/equity carve-outs, and 23 unnamed. As expected, most of the identifiable buyers are either LBO groups or other firms likely to operate the divested division as a stand-alone operation. Not classifying related diversified buyers as part of this group results in 75 percent (152 of 204) of identifiable buyers being classified as "stand-alone operators," whereas including them increases the rate to 97 percent (198 of 204). The 75 percent to 97 percent rate is somewhat higher than that obtained by John and Ofek (1995) for a sample of buyers of divested divisions, using an analogous measure. They find that, during 1986–1988, 48 percent of bidders and targets with available information have a 4-digit SIC code in common among the top five main SIC codes of the buyer and the two main SIC codes of the divested segment. In addition, a further 21 percent of the buyers are LBOs. The somewhat lower proportion of "related" buyers they document may reflect a stricter definition of relatedness, as well as a lower likelihood of buyers of divisions sold in voluntary restructurings being related to the divested divisions.

⁹ The seven Stauffer Chemical divisions later divested were also part of the nine Chesebrough Ponds divisions later divested. We therefore classified these divisions only once in our analysis of buyers.

IV. Conclusions

Previous literature has documented large and persistent value losses from diversification and the frequent use of breakups after takeovers. These two phenomena may be linked, with breakup takeovers of diversified firms undoing the value destruction created by combining business lines whose values are greater as stand-alone operations. We investigate the potential linkage in two steps. First, we see whether diversified firms in which more value is being destroyed are more likely to be taken over. In addition, we examine whether breakup takeovers are more likely than other takeovers to target value destroying diversification. The second step is taken both by exploiting LBO's greater propensity than other acquirers to breakup target divisions, and by following the breakup activity after takeover of a sample of large acquisitions.

Our measure of value destruction is the Berger and Ofek (1995) excess value measure, which compares the sum of the imputed stand-alone values of the segments of diversified firms to their actual values. The imputed stand-alone values are based on industry median multipliers of actual value to either assets or sales.

We show that the value loss from diversification is significantly related to the probability of subsequent takeover, with greater value losses associated with higher takeover probabilities. Conditional on takeover occurring, greater value losses are associated with higher probabilities that the acquirer is an LBO group. This result is consistent with LBOs being more likely than other acquirers to break-up the target.

For the sample of large acquisitions, we find that half of the large diversified targets are broken up, and that the mean value effect of diversification is -21 percent to -37 percent for these firms. In contrast, the large targets not broken up after takeover have a mean value effect from diversification of -5 percent. These results are consistent with the market for corporate control targeting and breaking-up combinations of business lines which have greater value when each line is operated on a stand-alone basis. If this is indeed what is going on, the buyers of the divisions from the broken-up target should tend to operate the divisions as stand-alone businesses. Based on an investigation of the buyers of the divested divisions from the sample of large targets, we find that 152 of 204 identifiable buyers are either LBOs or single-line firms that operate in a line of business related to that of the divested division.

Appendix

Multiplier estimation of imputed value and excess value: Equations (1) and (2) illustrate the approach:

$$I(V) = \sum_{i=1}^n AI_i * \left(\text{Ind}_i \left(\frac{V}{AI} \right)_{mf} \right) \quad (1)$$

$$EXVAL = \ln \left(\frac{V}{I(V)} \right) \quad (2)$$

where:

$I(V)$ = the imputed value of the sum of a firm's segments as stand-alone firms.

AI_i = segment i 's value of the accounting item (sales or assets) used in the valuation multiple.

$Ind_i(V/AI)_{mf}$ = the multiple of total capital to an accounting item (sales, assets, or EBIT) for the median single-segment firm in segment i 's industry.

$EXVAL$ = the firm's excess value.

V = the firm's total capital (market value of common equity + book value of debt).

n = the total number of segments in segment i 's firm.

Equation (1) shows that the firm's imputed value is the sum of segment-imputed values, which are obtained by multiplying an industry median multiplier of total capital to an accounting item by the segment's level of the accounting item. Equation (2) shows that the firm's excess value measure is the natural logarithm of the ratio of the firm's actual value to its imputed value.

To compute excess value using the sales multiplier, we multiply the industry median multiple of capital-to-sales for the stand-alone firms in the segment's industry by the segment's sales to obtain the imputed capital of the segment. We repeat this process for each of the firm's segments and then sum to obtain the firm's imputed value. Finally, we find the firm's excess value by taking the natural logarithm of the ratio of actual to imputed value. Extreme excess values are excluded from the analysis, with "extreme" defined for all three multipliers as natural logarithms of actual to imputed value above 1.386 or below -1.386 (i.e., actual values either more than four times imputed, or less than one-fourth imputed).

The asset multiple imputed values are found in an analogous manner. Another issue that arises is that it is much more common for the segment asset figures from the CIS tape to disagree with the COMPUSTAT firm totals than is the case with sales. The segment sum is usually less than the firm figure, indicating that the problem arises from unallocated assets. We deal with this problem in one of two ways: If the sum of the segment asset figures for a firm deviates from the firm's asset figure by more than 25 percent, we exclude the observation from all analyses using the asset multiples. If the deviation is within 25 percent, we adjust the firm's imputed value to reflect the fact that the multipliers have been multiplied by segment asset figures that are too small or too large. Specifically, the firm's imputed value is grossed up or down by the percentage deviation between the sum of its segments' assets and total firm assets. The excess value measure based on asset multiples is then found in the same way as the measure using sales multiples.

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