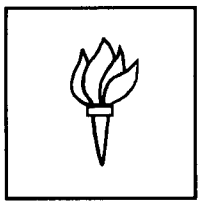

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Bustup Takeover of Value-Destroying Diversified Firms

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1. Introduction

Berger and Ofek (1995) confirm recent evidence by Lang and Stulz (1994) of a value loss from diversification in the 1980s, and use segment-level data to estimate the magnitude of the loss. They find that, during 1986-1991, the average diversified firm destroyed about 15% of the value its lines of business would have had if operated as stand-alone businesses. The evidence that diversification represented 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 thus whether these profit opportunities result in takeovers disciplining the managements 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 LBOs during this period transferred control over massive 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 their operation. Jensen (1986) extends this reasoning to value-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.

Break-ups of target assets occur regularly following mergers or acquisitions. Bhagat, Shleifer, and Vishny (1990) find that selloffs are a pervasive result of 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% 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 negative relation between abnormal stock returns and the number of segments reported by management. Of course, breaking up the entire firm is an extreme way to rapidly refocus the firm's divisions.

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

[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.

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. The resulting prediction is that diversified firms in which more value is being destroyed are more likely to be taken over and broken up.

The value loss from diversification, the use of break-ups after takeover, the ability to create value by increasing focus, and bidders' ability to earn higher returns by targeting poorly managed firms 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. We first examine whether diversified firms in which more value is being destroyed are more likely to be taken over. Finding that they are, we study whether break-up takeovers are more likely than other takeovers to target value destroying diversification. The comparison between bustup takeovers and other acquisitions is first made by exploiting the greater propensity of LBOs, relative to other acquirers, to break-up target divisions. In addition, we follow the break-up activity after takeover of a sample of large acquisitions.

To test the relation between value destruction and takeover probability, we follow Berger and Ofek in using segment-level data to estimate the magnitude of the value loss from diversification in two years, 1984 and 1987. 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 diversified firms that are subsequently taken over have significantly greater value losses from diversification than firms not subsequently taken over. Moreover, we find that, after controlling for other determinants of takeover, the value loss from diversification is significantly related to the probability of

subsequent takeover, with greater value losses associated with higher takeover probabilities.

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.

We examine in detail the subsample of targets which had values exceeding $500 million before being taken over. For this subsample of large targets, we document the frequency of post-takeover bustups and examine whether the value loss from diversification is greater for firms that are busted-up after takeover. We find that half of the large diversified targets are broken-up after they are acquired, and that the mean value effect of diversification is -22% to -33% for these firms. In contrast, those firms not broken-up after takeover have a mean valuation effect from diversification of -3% to 6%.

Finally, for the subsample of large targets, we examine the buyers of divisions divested from diversified targets after takeovers. We classify LBOs and 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 90% of the identifiable buyers are either LBOs or related focused 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 2 presents sample selection details, describes the sample, and explains our empirical approach. Section 3 presents the empirical tests, and section 4 concludes. The appendix

provides additional details on our empirical approach and variable construction.

2. Sample selection and estimation of segment values

2.1 *Sample selection and description*

FASB No. 14 and 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% of consolidated totals. The Compustat Industry Segment (CIS) database (active and research files) reports segment information for all Compustat firms other than utility subsidiaries.

We obtain data for all firms on the CIS database during the 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 (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 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% of total sales for the firm. Panel A of table 1 shows that these procedures result in a total sample of 1,519 multisegment firms, with 1,239 observations in 1984 and 1,089 observations in 1987.

We determine which sample firms are taken over in the four 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 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 1 shows, these procedures identify a total of 329 takeovers, of which 50 are LBOs. The four year period following 1984 contains 249 takeovers (31 LBOs), whereas the period following 1987 has 127 (26).

Panel A of table 1 shows that takeover frequency is high among our sample of multisegment firms, especially during 1985-1988. Twenty percent of the diversified firms from 1984 are taken over in the following four year period. For the 1987 sample, the takeover frequency is 12%. Panel B shows the distribution of takeovers and LBOs during the 1985-1991 period. The 84 takeovers and 16 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 five in 1991. Acquisitions by LBOs decrease even more rapidly than other takeovers after the demise of Drexel Burnham Lambert, with just one of the 22 takeovers in 1990-91 performed by an LBO.

2.2 *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.

2.3 *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. Mitchell and Lehn (1990) classify their sample of Value Line firms into targets and nontargets over an eight year period and Palepu (1986) estimates his acquisition model using a sample of acquired and random firms for a nine year period. 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, presented in table 2, 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. As table 2's bottom row shows, however, the stability over time of the

excess value measure obtained with the EBIT multiplier is much smaller. We therefore use only the asset and sales multipliers in our tests.

Table 2, combined with panel A of table 1, illustrates a research design trade-off between measuring excess value near the time of takeover and a possible lack of independence from measuring values for the same firm at different times. Table 2 shows 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 1 shows that using two base years results in many firms entering the sample in both years. The sample contains 1,519 firms, but 2,328 observations (the sum of the observations in the 1984 and 1987 subsamples). Using two base years represents a tradeoff between two extremes. For our sample period, one extreme would be to use only the 1984 base year, then follow firms for possible takeover during 1985-1991. This alternative would eliminate any concern about a lack of independence due to measuring values for the same firm at different times, but it would maximize the lag between measuring excess value and the time of takeover. The other extreme would be to calculate the excess value measures every year, and examine firms for possible takeovers during the following year only. This procedure would minimize the lag between the time excess value is measured and the time of takeover, but it would result in each firm producing as many as seven observations. We chose the middle ground of using two base years and examining firms for possible takeovers during the following four years. This choice is admittedly arbitrary. We address the independence concern that arises from some firms entering the sample twice by reporting results separately for each base year, as well as for the overall sample.

3. Value loss from diversification and subsequent takeover and break-up

3.1 *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 3 shows that value destruction is greater among 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 22.5% (32.6%), which is 5.2% (11.4%) 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 multisegment firms whose diversification policies result in greater value losses. The difference in mean value destruction between targets and nontargets is of similar magnitude in 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 2.9% more value based on the asset multiplier and 10.2% more (significant at the .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.

Although the preceding results show that acquirers tend to target diversified firms in which more value can be added through break-up, we do not know whether acquirers actually break-up, 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% of the buyout capital within one year of the LBO.[2] 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% following the seven LBO buyouts in their sample versus 12.3% for the 55 non-LBO acquisitions.

Table 4 presents results showing that value destuction is greater among future LBO targets than among other target firms. The mean value loss among multisegment firms subsequently taken private is 33.7% (43.5%) using the asset (sales) multiplier. This exceeds the loss among other multisegment targets by 14.1% (15%), significant at the 0.05 (0.10) level. The much larger value losses for LBO targets are consistent with LBOs being more likely than other acquirers to take value-increasing actions such as break-ups with their multisegment targets. These results continue to hold when the median value losses of LBO targets are compared to those of other firms.

The differences in mean and median value destruction between LBO targets and other targets are considerably larger in 1987 than 1984. For example, the difference in means using the asset (sales) multiplier is 20.9% (19.7%) in 1987 versus 8.8% (12.3%) in 1984. Two possible explanations arise for the greater effect within the 1987 sample. First, there is less likelihood that the value losses of 1987 firms change drastically prior to the LBO date than

[2]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. This may be a particularly valuable advantage when diversified targets are bought out, since Berger and Ofek (1995) find that excessive cross-subsidization is an important source of value loss in multisegment firms.

is true for 1984 companies. Table 1 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. An alternative possibility is that LBOs became more likely to make break-up acquisitions, rather than strategic ones, in the late-80's. 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-80's. 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.

3.2 *Value destruction as an explanator of takeover probability*

A concern with the preceding univariate tests is that they do not control for factors other than excess value that affect the likelihood of takeover. Therefore, we perform multivariate logit regressions in which a takeover (LBO) indicator is the dependent variable and excess value is included as an independent variable along with previously identified explanators of takeover probability taken from Palepu (1986), who explains the reasoning underlying each. In cases where we modify the variable constructed by Palepu, we note his original measure in parentheses. Return on assets (return on equity) is the ratio of net income before extraordinary items and discontinued operations 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. Price-earnings ratio is stock price divided by earnings per share. Market-to-book ratio is market value of common equity over book 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. We add to Palepu's variables the number of segments reported by the diversified firm on the CIS

database and the excess value measures.

Table 5 presents estimations of the takeover likelihood models. We use the table 5 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 5 and 6. The standardized elasticities in table 5 are calculated by first determining the probability of takeover at an evaluation point on the cumulative logistic distribution. We use the point which results when all of the explanatory variables have their median values.[3] 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).

The estimations in columns one through six use multisegment firms only. The results show that excess value has a strong negative relation with takeover probability, indicating that firms destroying more value with their diversification strategy are more likely to be taken over. For the overall, the 1984, and the 1987 samples, the estimate on excess value is always negative for both the asset and sales multiplier measures. The value loss coefficient estimates are significant at the 0.01 and 0.05 levels for the full sample, at the .05 level with the sales multiplier for the 1984 sample, and at the .10 level with the asset multiplier for the 1987 sample. The effect of value destruction on takeover likelihood appears to be important economically as well. For the full sample, changing the asset (sales) multiplier measure of excess value from its median to its 25th-percentile increases the acquisition probability by 1.9% (2.1%) from its evaluation point of 21.8% (20.1%). Consistent with Palepu (1986), the control variables that significantly affect takeover (in at least some of the estimations) are

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

size, growth, and leverage, although leverage's positive effect works in the opposite direction to that found by Palepu. For the asset (sales) multiplier estimation using the full sample, the elasticities of takeover likelihood with respect to size, growth, and leverage are 2.9% (2.1%), 1.2% (0.8%), and 1.6% (1.8%).

Although the preceding results show that takeover likelihood is related to the variation in diversified firms' value losses, some of that variation may arise for reasons other than diversification policy. By construction, the excess value measure has a median of zero among single-line companies, but there is still variation across single-segment firms in the excess value measure, which cannot be due to differences in diversification policy. The remainder of the paper therefore uses four additional sets of tests to provide evidence on whether value losses *due to diversification policy* affect the probability of acquisition and break-up. First, because the value loss from diversification can only arise in multisegment firms, we see whether having multiple segments increases the probability of takeover. Second, we examine whether the effect of excess value on acquisition likelihood is greater among multisegment than among single-segment firms. Third, because LBO acquirers are more likely to break-up diversified targets (and thus realize any value gains from increasing the focus of the target's lines of business), we explore whether the effect of excess value of acquisition likelihood among diversified firms is greater for firms acquired by LBOs than among other acquired firms. Finally, to provide direct evidence on the relation between the excess value measure and the probability of being broken up by an acquirer, we document the relation between excess value and the extent of post-acquisition break-up in a sample of large, diversified targets.

The estimation in column seven examines whether diversification increases the probability of takeover, after controlling for other determinants. It uses a sample containing both multisegment and single-segment firms from the 1984 CIS database. The single-segment

firms in this "combined 1984" sample are selected using the same sample selection criteria described in section 2.1 for the multisegment firms.[4] Diversification is measured by the number of segments, with more segments indicating greater diversification. Consistent with the hypothesis that diversification provides acquirers with more opportunity to profit from value creation, the number of segments is significantly positively (0.05 level) related to takeover likelihood. Moreover, increasing the number of segments from its median of two to its 75th-percentile of three leads to a 1.7% increase in takeover probability. The significantly positive relation between diversification and the probability of acquisition continues to hold when the number of segments variable is replaced by an indicator equal to one when the firm has multiple segments, and to zero otherwise (results not reported).

The effect of value destruction on subsequent acquisition also appears to be larger for multisegment than for single-line firms. The reported coefficient estimates on the two excess value measures of -0.293 and -0.346 for the 1984 sample of multisegment firms exceed by 133% and 27% the corresponding (unreported) estimates when the estimations are performed on the 1984 sample of single-segment companies. In addition, the coefficient estimates are not significantly different from zero in the single-segment estimation. These results indicate that the relation among multisegment firms between excess value and takeover probability does not merely reflect factors other than diversification.

Table 6 presents, for the firms subsequently taken over, estimations of the likelihood their takeover was by an LBO group. The only controls used are size, growth, and leverage, based on the results in the preceding takeover probability logits. The table 6 estimations are similar across both excess value measures, with the signs of the excess value coefficent estimates negative in all six estimations, and significant at better than the 0.05 level in

[4]These criteria resulted in a sample of 1646 single-segment firms, of which we eliminate half to reduce the data collection needed to identify firms subsequently taken over. The eliminations were done by sorting the sample by SIC code, then eliminating every second firm. The remaining single-segment firms thus have industry represetation proportional to the full sample of single-line companies.

three estimations. 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 3.7% (3%) from its evaluation point of 9.7% (11%). 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 7.7% 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 .10 level), are consistent with the earlier evidence of a smaller difference within that sample in mean and median value loss between subsequently taken-private firms and other takeover targets. Finally, the only control variable with significant coefficient estimates is sales growth, which is positively related to the probability that the takeover is by an LBO group.

3.3 *Value destruction and post-takeover break-up*

The preceding analysis assumes that takeovers of diversified firms often lead to break-ups. To provide evidence on this assumption, 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 $500 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 break-up 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 7 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.[5]

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 21.6% for the 32 targets subsequently broken up exceeds the value loss for the 32 targets not broken up by 19%. With the sales multiplier, the broken up targets have a mean value loss of 33.1% and the remaining targets have a mean value gain of 5.8%. These results are consistent with break-up takeovers targeting value destroying firms and strategic takeovers targeting 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, we construct such a measure by summing, for each target, all available

[5]Table 8 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.

selling prices of the divested divisions, 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 168 target divisions we know were divested by bidders in the two years following the acquisitions, just 87 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 acquistion price on the excess value measures and find that, using both measures, 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 .10 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 8 provides details on the sample of 64 large acquistions used in the table 7 tests. The first column provides the target's name. Many of the targets are household names and some have had their bustups documented by others. Bhagat, Shleifer, and Vishny (1990) document the post-takeover asset sell-offs of eight of our 64 targets. For example, they discuss the near break-up of AMF Incorporated. They note that Minstar, the acquirer of AMF, sold off most assets other than the boat division that it wanted.

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 acquistions has some differences from the remainder of our sample. For example, six of the 64 takeovers are announced in 1990, and three in 1991. Thus, 14% of the large acquistions occur in these two years, versus 6.7% for the full sample. The third column shows that the

prices paid for the target's equity tend to be very large, with most exceeding $1 billion. Finally, the buyers of these large targets are LBO associations in just 5 cases (not reported in the table). The resulting 8% frequency of the large acquistions which are by LBOs is lower than the 15% frequency in 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% for Ausimont N.V. to 154% for Firestone, with an average of 57.8%. 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 acquistion ranges from zero to 15, with an average of 2.6. Nineteen of the 32 acquisitions we classify as non-bustups have no divested divisions, whereas the remaining 13 have one or two divisions divested. In 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% for Contel to 155.2% for Stauffer Chemical, with an average of 49%. These figures are similar to those reported by Bhagat, Shleifer, and Vishny (1990), who report a range of 0.4% to 131.8%, with an average of 43.7%. Their measurement differs slightly from ours, in that they include the value of acquired debt in calculating their acquisition prices.

3.4 *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 firms in businesses related to that of the divested division. To provide preliminary evidence on this issue, we examine the buyers of all of the divisions divested by the seven acquirers that divested at least seven divisions. For the 67 divisions we know were divested by these acquirers, we classify the buyers into the following types: LBOs, related

firms, unrelated firms, and unnamed. We find that the number of buyers in each group is as follows: 23 LBOs, 33 related firms, 5 unrelated firms, and 6 unnamed. As expected, most of the identifiable buyers are either LBO groups or firms in related businesses.

4. Conclusions

Previous literature has documented large and persistent value losses from diversification and the frequent use of break-ups after takeovers. These two phenomena may be linked, with break-up 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 break-up takeovers are more likely than other takeovers to target value destroying diversification. The second step is taken both by exploiting LBOs' greater propensity than other acquirers to break-up target divisions, and by following the break-up 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 find that diversified firms that are subsequently taken over have significantly greater value losses from diversification than those not subsequently taken over. We also 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 acquirors 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 -22% to -33% for these firms. The large targets not broken up after takeover have a mean value effect from diversification of -3% to 6%. 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 target as a stand-alone business. Based on a preliminary investigation of the buyers of the divested divisions from the sample of large targets, we find that 56 of 61 identifiable buyers are either LBOs or focused firms in businesses related to that of the divested division.

Appendix

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

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

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

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, assets, or EBIT) used in the valuation multiple.
$\mathrm{Ind}_i(\frac{\mathrm{V}}{\mathrm{AI}})_{mf}$	=	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%, we exclude the observation from all analyses using the asset multiples. If the deviation is within 25%, 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.

The earnings before interest and taxes (EBIT) multiple imputed values use the same adjustment procedures as the asset multiple imputed values. One additional issue that arises with the EBIT measure is how to treat segments with negative EBITs, since multiplier approaches do not typically assign negative values to firms with negative earnings. We address this issue by replacing the EBIT multiplier imputed value with either an EBIT-plus-depreciation (EBITD) multiplier imputed value, if positive, or with the segment's sales multiplier imputed value.

Table I

Description of sample frequencies by group and by year for the samples of: diversified firms; diversified firms that were subsequently taken over; and diversified firms that were subsequently taken over by an LBO group.

A. Sample frequencies for the total sample and the 1984 and 1987 base years

	Total	1984	1987
Number of firms	1519	1239	1089
Takeovers	329	249	127
Takeover Frequency	22%	20%	12%
LBOs	50	31	26
LBO Frequency	3%	3%	2%

B. Takeovers and LBOs by year of announcement

Year Announced	Takeovers	LBOs
1985	61	7
1986	67	8
1987	55	6
1988	84	16
1989	40	12
1990	17	1
1991	5	0
Total	329	50

Table II

Average autocorrelation for excess value measures at various lags.

	Average autocorelation with a lag of				
Excess value	1 year	2 years	3 years	4 years	5 years
Asset multiplier[1]	0.80	0.68	0.57	0.48	0.40
Sales multiplier[2]	0.80	0.68	0.54	0.46	0.38
EBIT multiplier[3]	0.46	0.32	0.25	0.23	0.18

[1] 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.

[2] 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. [3] The natural logarithm of actual value/imputed value with each segment's imputed value equal to the segment's EBIT multiplied by its industry median capital-to-EBIT ratio.

Table III

Value destruction in diversified firms that do or do not become takeover targets.

	Means			Medians		
Sample	No takeover	Takeover	Difference	No takeover	Takeover	Difference
Excess value, asset multiplier[1]						
Full sample	-0.172	-0.225	-0.052[b]	-0.204	-0.233	-0.029
1984 sample	-0.188	-0.224	-0.036	-0.199	-0.248	-0.049[c]
1987 sample	-0.155	-0.226	-0.071[c]	-0.214	-0.181	0.032
Excess value, sales multiplier[2]						
Full sample	-0.213	-0.326	-0.114[a]	-0.230	-0.332	-0.102[a]
1984 sample	-0.244	-0.332	-0.088[b]	-0.277	-0.352	-0.075[b]
1987 sample	-0.181	-0.315	-0.134[a]	-0.178	-0.265	-0.087

[1] 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.

[2] 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.

[a] denotes significance at the 1% level.
[b] denotes significance at the 5% level.
[c] denotes significance at the 10% level.

Table IV

Comparison of value destruction in diversified takeover targets between 64 targets acquired by LBOs and 369 targets with non-LBO acquirers.

	Means			Medians		
Sample	Non-LBO	LBO	Difference	Non-LBO	LBO	Difference
Excess value, asset multiplier[1]						
Full sample	-0.193	-0.337	-0.141[b]	-0.181	-0.321	-0.140[a]
1984 sample	-0.199	-0.287	-0.088	-0.211	-0.269	-0.058
1987 sample	-0.177	-0.386	-0.209[a]	-0.133	-0.394	-0.261[a]
Excess value, sales multiplier[2]						
Full sample	-0.285	-0.435	-0.150[c]	-0.297	-0.467	-0.170
1984 sample	-0.296	-0.419	-0.123	-0.328	-0.383	-0.055
1987 sample	-0.258	-0.455	-0.197[c]	-0.193	-0.607	-0.414

[1] 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.

[2] 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.

[a] denotes significance at the 1% level.

[b] denotes significance at the 5% level.

[c] denotes significance at the 10% level.

Table V

Takeover likelihood models. The top number for each variable[1] is the parameter estimate, the middle number is the elasticity[2], and two-tailed P-values are in parentheses.

Sample	All	All	1984	1984	1987	1987	Combined 1984
Observations=0, no takeover	1030	1342	534	682	496	660	1213
Observations=1, takeover	239	297	159	202	80	95	320
Probability of takeover at evaluation point[3]	20.096	18.804	24.357	23.805	14.919	12.791	21.812
Intercept	-0.832[c]	1.478[a]	-0.533	-0.843[c]	-1.432[c]	-1.745[a]	-0.998[a]
	(0.052)	(0.001)	(0.337)	(0.054)	(0.051)	(0.003)	(0.001)
Excess value, asset multiplier	-0.495[b]		-0.293		-0.694[c]		
	1.915		1.350		1.958		
	(0.024)		(0.295)		(0.084)		
Excess value, sales multiplier		-0.360[a]		-0.346[b]		-0.370	
		2.061		2.231		1.643	
		(0.010)		(0.050)		(0.124)	
Return on assets	0.415	-0.313	-0.978	-1.255	1.945	0.859	-0.898
	0.294	0.225	0.839	1.064	1.148	0.438	0.774
	(0.772)	(0.780)	(0.602)	(0.387)	(0.426)	(0.672)	(0.348)
Size	-0.126[a]	-0.098[b]	-0.095	-0.075	-0.119	-0.070	-0.104[b]
	2.894	2.121	2.238	1.730	2.302	1.164	2.144
	(0.007)	(0.018)	(0.112)	(0.162)	(0.123)	(0.322)	(0.017)
Liquidity	0.657	0.057	0.850	0.213	0.212	-0.137	0.049
	0.926	0.075	1.336	0.325	0.249	0.143	0.081
	(0.265)	(0.902)	(0.281)	(0.736)	(0.820)	(0.852)	(0.898)
P/E ratio	0.000	0.002	0.001	0.003	0.001	0.003[c]	0.001
	0.000	0.137	0.070	0.208	0.065	0.172	0.076
	(0.773)	(0.141)	(0.640)	(0.295)	(0.659)	(0.064)	(0.742)
Market/book ratio	0.013	0.011	0.012	0.011	0.013	-0.004	0.002
	0.126	0.101	0.118	0.107	0.108	0.017	0.023
	(0.447)	(0.518)	(0.506)	(0.532)	(0.874)	(0.958)	(0.899)
Number of segments	-0.008	-0.007	0.018	-0.000	-0.128	-0.120	0.099[b]
	0.129	0.107	0.333	0.000	1.699	1.399	1.735
	(0.908)	(0.912)	(0.826)	(0.995)	(0.309)	(0.289)	(0.046)
Sales growth	-0.850[a]	-0.636[a]	-0.718[c]	-0.390	-1.062[b]	-1.191[a]	-0.559[b]
	1.185	0.839	1.078	0.730	1.236	1.225	0.880
	(0.003)	(0.007)	(0.060)	(0.166)	(0.029)	(0.008)	(0.011)
Leverage	0.821	0.946[b]	0.626	0.824	1.666[c]	1.648[b]	0.964[b]
	1.613	1.778	1.480	1.931	2.465	2.151	2.227

Table V - continued

[1] Variable definitions are as follows. The asset and sales multiplier measures of excess value are as defined in Table IV. 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. Price-earnings ratio is stock price divided by earnings per share. Market/book ratio is market value of common equity over book equity. Number of segments is the number of segments listed by the firm on the CIS database. Sales growth is the annual rate of change in sales. Leverage is the ratio of debt to assets.

[2] The elasticities for the explanatory variables are defined as the percentage increase in the probability of takeover above the evaluation point (see note 3 below) when the variable's median is replaced with either its 25th- or 75th-percentile (whichever leads to a probability increase).

[3] Probability of takeover at 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.

[a] denotes significance at the 1% level.
[b] denotes significance at the 5% level.
[c] denotes significance at the 10% level.

Table VI

Likelihood of LBO versus non-LBO takeover. The top number for each variable[1] is the parameter estimate, the middle number is the elasticity[2], and P-values are in parentheses.

Sample	All	All	1984	1984	1987	1987
Observations=0, non-LBO takeover	291	364	210	260	81	104
Observations=1, LBO takeover	42	53	21	30	21	23
Probability of takeover at evaluation point[3]	9.712	11.033	10.967	8.613	13.412	15.677
Intercept	-2.385[a]	-2.186[a]	-2.782[a]	-2.426[a]	-1.701	-1.405
	(0.001)	(0.001)	(0.008)	(0.004)	(0.134)	(0.169)
Excess value, asset multiplier	-1.370[a]		-0.861		-2.251[b]	
	3.676		2.402		7.666	
	(0.008)		(0.179)		(0.013)	
Excess value, sales multiplier		-0.607[b]		-0.542		-0.670
		2.991		1.184		4.846
		(0.043)		(0.158)		(0.183)
Size	-0.099	-0.092	0.006	-0.042	-0.222	-0.178
	0.977	1.012	0.061	0.346	3.057	2.681
	(0.413)	(0.373)	(0.971)	(0.759)	(0.237)	(0.296)
Sales growth	2.524[a]	1.394[b]	2.372[b]	1.463[a]	2.819[b]	1.456
	1.988	1.182	2.137	1.034	2.861	1.612
	(0.001)	(0.039)	(0.017)	(0.008)	(0.015)	(0.138)
Leverage	0.434	0.956	-0.839	0.014	1.070	1.148
	0.465	1.178	1.039	0.013	1.911	2.334
	(0.679)	(0.254)	(0.617)	(.992)	(0.481)	(0.332)

[1] see note 1 of Table V.
[2] see note 2 of Table V.
[3] see note 3 of Table V.

[a] denotes significance at the 1% level.
[b] denotes significance at the 5% level.
[c] denotes significance at the 10% level.

Table VII

Panel A: Value loss for firms later busted-up versus those not busted-up.

	Means			Medians		
Excess value	No Bustup	Bustup	Difference	No Bustup	Bustup	Difference
Asset multiplier[1]	-0.026	-0.216	-0.190[c]	-0.030	-0.217	-0.187[b]
Sales multiplier[2]	0.058	-0.331	-0.389[a]	0.080	-0.324	-0.404[b]
Number of segments	3.4	3.8	0.4	3.0	3.0	0.0
Observations	32	32		32	32	

Panel B: Regressions of proportion of target's value subsequently divested on the excess value measures. P-values in parentheses.

Dependent variable	Minimum value divested/acquisition price	
Observations	64	64
Adj R^2	0.057	0.041
Intercept	0.199[a]	0.208[a]
	(0.000)	(0.000)
Excess value, asset multiplier	-0.258[b]	
	(0.032)	
Excess value, sales multiplier		-0.159[c]
		(0.060)

[1] see note 1 of Table IV.

[2] see note 2 of Table IV.

[a] denotes significance at the 1% level.

[b] denotes significance at the 5% level.

[c] denotes significance at the 10% level.