



Asset sales and takeover threats

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Abstract

This research addresses the question of whether the existence of a recent takeover threat affects the market reaction to a subsequent sale of assets. The effect of a prior takeover threat on the stock price reaction to an asset sale is examined from the perspective of both the buying firm and the selling firm. The total gains to the transaction are estimated as a market weighted average of the abnormal returns to the two firms. The results show that when there has not been a recent takeover threat on the selling firm, abnormal returns are significantly positive for the seller, the buyer and in total. However, if the selling firm has faced a takeover threat within the previous year, the abnormal returns upon announcement of an asset sale are insignificant for the seller, negative for the buyer, and negative for a portfolio of the two. Hence, the market has a lower estimate of the overall gains in transactions that follow takeover threats on the selling firm; in fact, these transactions result in a net wealth reduction.

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1. Introduction

Previous research on asset sales between firms has found that shareholders of selling firms experience gains upon announcement of a sale (e.g., [Hearth & Zaima, 1984](#); [Klein, 1986](#)) while the results for buying firms are mixed, with some studies (e.g., [Jain, 1985](#); [Rosenfeld, 1984](#)) finding significantly positive gains and others (e.g., [John & Ofek, 1995](#); [Sicherman & Pettway, 1987](#); [Zaima & Hearth, 1985](#)) finding insignificant gains. However, there is only limited research studying both sides of an asset sale simultaneously.

While gains to sellers are positive on average, there is considerable cross-sectional variation. The circumstances under which a firm conducts a sale of assets can have an effect on the type of assets divested, on the reservation price required, as well as on how the market perceives the sale. For instance, [Rosenfeld \(1984\)](#), [Hearth and Zaima \(1984\)](#), and [Sicherman and Pettway](#)

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(1992) find that abnormal returns are lower for selling firms in relatively poor financial health. The purpose of this study is to examine the market's reaction to an asset sale that follows a takeover threat. As outlined below, there are a number of reasons that a takeover threat may affect the way in which a subsequent asset sale is conducted. Further, the effect is examined from both the selling and the buying firms' perspectives.

The market's reaction to an asset sale could be different following a takeover threat for a number of reasons. First, as per [Bhagat, Shleifer, and Vishny \(1990\)](#), the firm could be conducting efficiency enhancing asset sales because of the pressure from a takeover threat. This would increase firm value and possibly preempt a takeover. Second, because of the pressure inherent in a threat of takeover, the firm may sell assets for a lower price than it would otherwise. [Donaldson \(1990\)](#) states that "under the fire of hostile attack . . . companies can and do divest hundreds of millions of dollars of going concern value. But a fire sale puts the vendor in an impossible bargaining position." Along a similar vein, [Pulvino \(1998\)](#) finds that airlines selling used aircraft receive lower prices when they are in poorer financial health. Pressure from the market for corporate control may therefore result in asset sales transferring wealth from seller to buyer. Third, takeover threats may result in firms selling assets to avoid a takeover, but not by increasing efficiency. For instance, the crown jewels defense involves selling the assets that are attracting bidders, even if current management is first best. This hypothesis suggests that the total gains available in an asset sale¹ will be lower if the sale follows a takeover threat. Fourth, there may be no difference in the sales themselves, but the stock price of the selling firm may be reduced because of a decline in the expected takeover premium. Examining asset sales from the perspective of both the buyer and seller (as well as overall) will allow us to more clearly distinguish between each of these effects.

Previous researchers have examined the effect of the market for corporate control on asset sales. [Bhagat et al. \(1990\)](#) use a sample of 62 takeover targets to examine the differences in postoffer divestitures for firms successfully taken over and firms surviving a hostile threat. They find that firms which survive a hostile takeover bid subsequently divest the same amount of assets (measured as a fraction of the offer price) as do successful bidders. [Bhagat et al. \(1990\)](#) state that "firms escaping the takeover often do most of the things that the acquirer would have done anyway." One implication is that the threat of takeover induces firms to make efficiency enhancing divestitures. However, the [Bhagat et al. \(1990\)](#) study examines only the dollar amount of assets divested and does not examine the market's estimate (i.e., abnormal returns) of the value those transactions. [Loh and Rathinasamy \(1997\)](#) study the effect of a recent implementation of an antitakeover device on the market reaction to an asset sale. They find that firms that have not recently adopted antitakeover devices have significantly positive abnormal returns upon announcement of a selloff, while those that have adopted antitakeover devices receive insignificant returns. They conclude that an antitakeover device "alters investor perceptions about the management's intention" with regard to future actions, including asset sales. Finally, [Datta and Iskandar-Datta \(1996\)](#) show that voluntary asset sales undertaken to fend off a takeover threat result in a wealth reduction for the divesting firm's shareholders and bondholders.

This study expands on previous research in two ways. First, it looks at the effects of both a recent implementation of a takeover defense and a recent takeover threat. Both of these cases may indicate that management feels pressure from the market for corporate control, which may

change the way in which the market interprets asset sales. Second, asset sales are examined from three different perspectives: gains to the seller's stockholders, to the buyer's stockholders, and equity gains to the transaction as a whole.² By utilizing a sample consisting of asset sales for which return data on both the selling firm and the buying firm is available, the market's reaction to the sale can be measured for both firms. This type of sample allows us to estimate the total equity gains across both firms. This "total equity return" is used as a proxy for the market's estimate of the total gains available in the transaction. The returns to each individual firm in a transaction can be affected by both the total available gains to the transaction, and by the way in which those gains are divided between the firms. Examining the equity returns to both firms and in total allows us to better distinguish between wealth transfer effects and differences in the total level of available gains. [Sicherman and Pettway \(1992\)](#) use a sample of buyers and sellers from the same transactions to show that both buyers and sellers experience higher gains when a price for the asset is publicly disclosed, and the sellers receive lower gains when they have recently experienced a credit downgrade. However, they do not examine variation in the total equity returns to the transaction. An examination of total equity returns in this context will not only add to the literature on asset sales, but may also help shed light on the role of takeover threats in the efficient allocation of corporate assets.

The results show that across the entire sample, average abnormal returns are significantly positive for both selling firms and buying firms upon announcement of an asset sale. When the selling firm has not been the subject of a takeover threat in the year prior to the sale, the results are the same as for the sample as a whole. However, when the seller has recently been threatened, the seller experiences no gains and the buyer experiences significantly negative abnormal returns. The average total equity gain (buyer plus seller) to a transaction is significantly negative when the selling firm has faced a takeover threat. The results hold when controlling for the financial health of the firms, the size of the transaction, and whether the transaction is part of an ongoing program of divestitures (or purchases). The main conclusion is that the threat of takeover does affect the market's reaction to an announcement of a sale of assets. However, the effect is different than may previously have been supposed. On average, asset sales following takeover threats have lower total equity gains and most of this reduction is absorbed by the buyer. The results indicate, in contrast to previous work (e.g., [Bhagat et al., 1990](#)), that pressure from the market for corporate control does not necessarily result in firms making efficiency enhancing divestitures. As well, since the buyer fares the worst in cases where the seller has been under a takeover threat, it seems that the pressure of a takeover threat does not reduce a selling firm's bargaining power. A takeover threat may, in fact, provide an incentive for management to bargain harder when selling assets.

The rest of the paper is organized as follows: [Section 2](#) details the sample used and methodology employed, [Section 3](#) presents the results, and [Section 4](#) provides concluding remarks.

2. Sample and methodology

The initial sample consists of all of the voluntary sell-offs announced in *Mergers and Acquisitions* between 1982 and 1991, inclusive. The day of the first announcement of the

sale in the *Wall Street Journal* (*WSJ*) was taken as the event date for the selling firm, while the first mention in the *WSJ* of the buyer was taken as the event date for the buying firm.³

Sales of assets classified as having SIC codes between 60 and 64⁴ were excluded because of the regulatory environment. Also excluded were those sales for which no announcement was made in the *WSJ* or for which there were other events for either firm within the event window. Sales were omitted if their event dates were after the effective date of the sale as given in *Mergers and Acquisitions* (indicating that the sale may have been public knowledge before the *WSJ* announcement), if the selling firm was in bankruptcy or very recently emerged from bankruptcy, and if the firm's stock stopped trading before the effective date of the transaction. Only those transactions for which both buyer and seller were listed on NYSE or AMEX and had returns available on CRSP were included in the sample. Finally, two transactions were excluded because they were found to be sale-and-lease-back agreements. The final sample consists of 422 transactions (844 firms).⁵

For each firm, the *WSJ* was used to determine if the firm had been the target of a takeover bid within 1 year prior to the asset sale or if there were public rumors that the firm was "in play." The *WSJ* was also used to determine which firms had adopted new takeover defenses in the prior year.⁶ Although no *a priori* reasons are presented here for why a takeover threat on the buying firm may affect asset sale abnormal returns, the results for both selling and buying firms are presented for the sake of completeness.

The event study was conducted using market adjusted returns. [Brown and Warner \(1980, 1985\)](#) have shown this methodology to be effective in detecting stock price reactions to specific events. Cumulative abnormal returns (CARS) were calculated over a 3-day event window from $t = -2$ to $t = 0$. Details of the methodology and statistics employed are given in [Appendix A](#).

Total equity gains to the transaction are estimated by taking a market weighted average of the 3-day CARS for buyer and seller. Market weights are measured by the market value of common equity 10 days prior to the event date.

As well as univariate statistics, the effect of a prior takeover threat is also examined within a regression framework in order to control for other variables possibly affecting abnormal returns. [Mayers and Singh \(1992\)](#) and [John and Ofek \(1995\)](#) find that sales that are part of an on-going program of divestitures receive significantly smaller abnormal returns on average due to the market discounting much of the gain when the program becomes known. Two (buyer and seller) dummies are included in the regressions to control for the transaction being part of an ongoing program of divestitures (purchases) by the seller (buyer). Firms were classified as being in a program of sales if there was a *WSJ* article announcing the start of a program in the year prior to the sale or if the firm had announced two or more other sales (purchases) in the previous year.⁷ The financial health of the firms and the size of the divestiture have also been found to have an effect on abnormal returns. To control for the financial health of the firms, the regressions include the return on assets, interest coverage, and debt to assets ratios for both firms. To control for the size of the sale, a variable is included which equals zero if no price is reported and equals price divided by firm assets if a price is reported.⁸ As a final control variable, the regressions on buyer and seller CARS include the log of the market value of equity of the firm as that is known to affect abnormal returns.⁹

3. Results

Financial characteristics of the firms were collected from COMPUSTAT (or the financial statements) for the year prior to the year of the sale announcement. Results are contained in Table 1. Differences between buying and selling firms are tested for statistical significance using *t*-tests and Wilcoxon Rank Sum tests for the means and medians, respectively. Only 420 buying firms and 414 selling firms had financial data available. There is no significant difference in the mean size of buyers and sellers by book value of assets, book value of equity, or market value of equity. Sellers have significantly larger median book value of assets and book value of equity. Sellers exhibit significantly lower income/asset ratios, have significantly higher leverage ratios and significantly lower interest coverage ratios.^{10, 11}

In order to get a better sense of the relative performance of the firms in the period leading up to the asset sale, CARS for buyers and sellers starting 250 trading days before the event until 50 days after the event are presented in Fig. 1. Sellers have been underperforming the market for the year leading up to the sale, while buyers have been outperforming the market. The picture presented is consistent with the results on the financial ratios. The assets are being sold by poor performers to good performers.

Of the 422 selling firms in the sample, 45 are classified as being under the threat of takeover and 38 had recently instituted a new takeover defense.¹² Of the 422 buying firms, only 17 were subject to a takeover threat, and 25 instituted a new defense.¹³ The differences are significant at any conventional level. It seems that pressure from the market for corporate control is associated more with the sale of assets than with purchases.

Prices paid for the assets were obtained if reported in the *WSJ* (in the initial announcement or later articles) or from *Mergers and Acquisitions*. A price was available in 276 cases. The average price was \$163,121,504 and constitutes an average 9.69% of the book value of assets of the selling firm and 16.98% of the book value of assets of the buying firm. Thus, the average sale is a significant transaction to both the buyer and the seller.

Table 1
Financial characteristics of sample firms in the study

	Buying firms		Selling firms		Difference	
	Mean	Median	Mean	Median	Mean	Median
Book value of assets ^a	6614.23	1464.85	5822.51	2399.36	791.72	−934.51***
Book value of equity ^a	1843.72	646.05	1975.69	860.00	−131.97	−213.95***
Market value of equity ^a	2976.89	1002.31	2978.57	1185.17	−1.68	−182.86
Income (bef. extra. items) ^a	256.14	75.36	229.03	76.72	27.11	−1.36
Income to assets ratio	0.0569	0.0511	0.0355	0.0420	0.0214***	0.0091***
Debt to assets ratio	0.2105	0.1944	0.2316	0.2090	−0.0211**	−0.0146**
Interest coverage ratio	10.2934	4.3157	5.3579	3.4878	4.9355***	0.8279***

^a Figures are given in millions of dollars.

** Indicates difference significant at 5% level.

*** Indicates difference significant at 1% level.

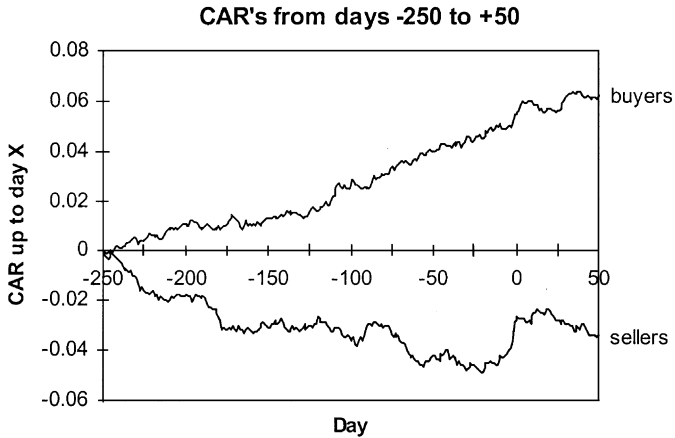


Fig. 1. CARS pre- and postevent. The figure shows market adjusted returns for buying and selling firms involved in a sample of 422 asset sales between 1982 and 1991. The abnormal returns are cumulated from 250 trading days before the announcement of the sale up to 50 days after the announcement.

Table 2 reports the mean CARS over the entire sample. The results show that both buyers and sellers have significantly positive CARS (0.54% and 1.08%, respectively), with seller CARS being significantly larger. The CARS for buyers and sellers have a slight positive correlation of 0.0726 (not reported in the table). Consistent with the results for buyers and sellers separately, the mean total equity CAR for the transactions is significantly positive at 0.42%.

We now look at the effect of the market for corporate control on the market’s reaction to an asset sale. First, we partition the sample based on whether the buyer or seller have recently adopted a takeover defense. The adoption of a takeover defense may indicate that the firm is feeling pressure from the market for corporate control, possibly affecting the types of transaction it engages in. Table 3 presents the results. Partitioning based on the seller’s adoption of a takeover defense shows no significant difference in the CARS for buyers nor for the total equity CARS to the transaction; they are significantly positive in all cases. The selling firms’ CARS are significantly positive when they have not adopted a takeover defense, but are insignificantly different from zero when they have adopted a defense. This is consistent with the findings of Loh and Rathinasamy (1997). However, the difference between the defense and no-defense subsamples is statistically insignificant.

When the buying firm has adopted an antitakeover provision there is no significant difference to the CARS for the selling firm. Buying firms’ CARS are significantly positive when they

Table 2
Mean CARS for entire sample

Buyer CAR	Seller CAR	Difference	Total equity CAR
0.0054 (2.89)***	0.0108 (5.81)***	−0.0054 (−2.06)**	0.0042 (3.34)***

z-statistics are in parentheses.
 ** Indicates significance at 5% level.
 *** Indicates significance at 1% level.

Table 3
Effect of institution of takeover defense on CARS

Seller instituted takeover defense	Yes ($N = 38$)	No ($N = 384$)	Difference
Mean seller CAR	0.0066	0.0112***	-0.0046
Mean buyer CAR	0.0088**	0.0050**	0.0038
Mean total CAR	0.0063*	0.0040***	0.0023
Buyer instituted takeover defense	Yes ($N = 25$)	No ($N = 397$)	
Mean seller CAR	0.0080*	0.0110***	-0.0030
Mean buyer CAR	-0.0022	0.0058***	-0.0080*
Mean total CAR	-0.0007	0.0045***	-0.0052

* Indicates that the mean is significantly different from zero at a 10% level.

** Indicates that the mean is significantly different from zero at a 5% level.

*** Indicates that the mean is significantly different from zero at a 1% level.

have not adopted a defense, but are negative (insignificant) when they have. The difference is significant at a 10% level. Thus, as with the [Loh and Rathinasamy \(1997\)](#) findings for selling firms, abnormal returns are lower for firms buying assets after they have adopted a takeover defense. Total equity CARS to the transaction are significantly positive when the buyer has not adopted a defense, and are negative (insignificant) when they have. The difference is insignificant.

Table 4 presents the CARS when the sample is divided according to the existence of a takeover threat. It is expected that an actual takeover threat will have a larger effect than the adoption of a takeover defense. Table 4 shows that in transactions following a takeover threat on the buying firm, the buyer exhibits insignificant gains on average, while the buyer CARS are significantly positive if they have not been threatened. However, the difference between threatened and nonthreatened buyers is insignificant at any conventional level. There are no significant differences in seller or total equity CARS following a threat on the buyer.

Table 4
Effect of recent takeover threat on CARS

Seller recently threatened	Yes ($N = 45$)	No ($N = 377$)	Difference
Mean seller CAR	0.0052	0.0115***	-0.0063**
Mean buyer CAR	-0.0107**	0.0073***	-0.0180***
Mean total CAR	-0.0083**	0.0057***	-0.0140***
Buyer recently threatened	Yes ($N = 17$)	No ($N = 405$)	
Mean seller CAR	0.0090*	0.0109***	-0.0019
Mean buyer CAR	-0.0000	0.0056***	-0.0056
Mean total CAR	0.0107**	0.0040***	0.0067

* Indicates that the mean is significantly different from zero at a 10% level.

** Indicates that the mean is significantly different from zero at a 5% level.

*** Indicates that the mean is significantly different from zero at a 1% level.

When the seller has not been threatened by takeover in the previous year, CARS for the seller, buyer and in total are all significantly positive. However, when the seller has been under a takeover threat, seller CARS are insignificantly different from zero, and buyer and total equity CARS are significantly negative. While selling firm shareholders, on average, do not gain from an asset sale following a takeover threat, shareholders of the buying firm actually lose. Altogether, on average there are negative total equity gains to the transaction if the sale follows a threat on the seller.

These last results are the main contributions of this paper. Markets seem to interpret sales following a takeover threat on the selling firm as having lower overall gains than other sales. When measured by equity reactions, the total gain is negative following a takeover threat, but is positive when there is not a threat. Further, there are no gains for either the buying firm or the selling firm, indicating that there is no wealth transfer to the buyer when dealing with a selling firm under the pressure of a takeover threat. In fact, the buying firm fares the worst when dealing with a threatened seller. A possible explanation for this is that the pressure of a takeover threat may induce a selling firm to bargain harder over price. This would indicate that buying firms do not gain any bargaining power advantage when dealing with firms under pressure from the market for corporate control. This is in contrast to the findings of Pulvino (1998) who reports that airlines in poor financial health receive lower prices for aircraft and buyers benefit from this. The difference between the results here and those in Pulvino (1998) may be due to the specifics of the industry studied by Pulvino (airlines) or his focus on prices paid for assets rather than market reactions as in this study.

While a reduction in the takeover premium might explain why seller CARS are lower following a threat, it does not explain why CARS for the buying firms are also lower. Overall, markets do not seem to interpret asset sales following takeovers as being attempts by the selling firm to enhance shareholder value. Rather, these asset sales result in a net reduction in wealth.

It is necessary to see if the results hold when controlling for other factors known to affect abnormal returns. Table 5 contains the results of three regressions corresponding to three dependent variables: buyer CAR, seller CAR, and total equity CAR. The CARS are regressed on a dummy variable equaling one if the seller has experienced a takeover threat and zero otherwise. The control variables included in the regressions are described in the previous section. Table 5 reports the coefficient on each variable along with the *t*-statistics which were calculated using White's heteroskedasticity consistent covariance matrix. Transactions were omitted from the regressions if either firm had missing financial data or if one of the firms reported an interest expense of zero. The final sample for the regressions consists of 404 asset sales.

The results in Table 5 show that the size of the asset sale has a significant effect on abnormal returns. Price paid as a proportion of firm assets is significantly positive in all three regressions. Larger transactions are therefore associated with higher abnormal returns. Conversely, as seen in regression (1) in Table 5, the size of the transaction with respect to the seller's assets has a negative effect on buyer CARS. This could be due to selling firms being more careful in their bargaining when selling significant assets, as opposed to smaller assets for which speed of sale might be more important. Looking at the effect of a takeover threat on the selling firm, the results of the regressions are consistent with the previous findings. A takeover threat on the seller has an insignificant negative effect on seller CARS, and a significantly negative effect on buyer and total equity CARS. This reconfirms the conclusion that the market perceives the

Table 5
Regressions of CARS on dummy for takeover threat

Dependent variable	(1) Buyer CARS	(2) Seller CARS	(3) Total CARS
Constant	0.03467 (2.93)***	0.00051 (0.03)	0.00729 (1.58)
Seller takeover threat	−0.01336 (−1.88)*	−0.00776 (−0.93)	−0.01341 (−3.47)***
Seller in program	−0.00197 (−0.47)	−0.00531 (−1.035)	−0.00469 (−1.60)
Buyer in program	−0.00020 (−0.04)	0.00187 (0.33)	0.001430 (0.43)
Buyer ROA	−0.12418 (−2.03)**	0.01815 (0.32)	−0.03745 (−1.07)
Buyer interest coverage	−0.00004 (−0.85)	0.00003 (0.48)	−0.00002 (−0.68)
Buyer debt/assets	−0.01947 (−1.31)	−0.01616 (−1.02)	−0.00977 (−1.00)
Seller ROA	−0.04137 (−0.92)	0.01075 (0.21)	0.01898 (0.57)
Seller interest coverage	0.00027 (2.17)**	0.00005 (0.30)	0.00011 (1.14)
Seller debt/assets	−0.01859 (−1.31)	0.03235 (0.96)	0.00352 (0.34)
Price/buyer assets	0.02715 (2.47)***	0.00686 (0.77)	
Price/seller assets	−0.02956 (−1.80)*	0.11578 (2.60)***	
Price/total assets			0.081515 (1.88)*
Log (market value equity)	−0.00188 (−1.47)	−0.00024 (−0.13)	
Sample size	404	404	404
Adj. R^2	0.071	0.064	0.026

* Indicates that the mean is significantly different from zero at a 10% level.

** Indicates that the mean is significantly different from zero at a 5% level.

*** Indicates that the mean is significantly different from zero at a 1% level.

overall gains to asset sales to be lower following a takeover threat on the selling firm; however, it is the buying firm that fares the worst in these cases.

4. Summary and conclusions

The effect of takeover threats on corporate asset sales was examined using a sample of asset sales in which both the buyer and the seller were known. In this way, the transaction could be examined from the perspectives of the buyer, the seller and overall. Because a prior takeover threat can put a firm under a considerable amount of pressure, the types of asset sales in which the firm engages might be expected to be different following a threat. The pressure of a threat could cause a firm to divest assets in an attempt to enhance efficiency and increase shareholder wealth. Conversely, the threat of takeover could result in asset sales designed to preempt the takeover without any efficiency gains. As well, threatened firms may be in a very different bargaining position when it comes to negotiating a price for assets.

The results show that, on average, abnormal returns are positive for both the buyer and seller of assets across the whole sample. However, if the selling firm has faced a takeover threat within the year previous to the sale then the seller receives insignificant returns and the returns to the buyer are significantly negative. The total abnormal equity returns (a market weighted average of buyer and seller) are significantly negative following a takeover threat on the seller. Hence, asset sales following a takeover threat on the selling firm result in an average reduction in total shareholder wealth across the two firms. The results hold in a multiple regression framework

when controlling for the financial characteristics of the firms, the relative size of the asset sold, and whether one of the firms was engaged in a program of asset sales or purchases.

Unlike what might be expected, there is no evidence that buying firms benefit, through negotiating a lower price, from dealing with firms that are under pressure from the market for corporate control. Hence, the results are not due to a wealth transfer effect between the firms. As well, because it is the buying firm which fares the worst when dealing with a threatened seller, the results are not due solely to a reduction in the takeover premium. Finally, there is no indication that a takeover threat results in the selling firm engaging in efficiency enhancing divestitures. The effect of a prior takeover threat seems to be primarily on the market's estimate of the overall value of the transaction. In fact, the results indicate that asset sales by threatened firms, on average, produce a net reduction of shareholder wealth and result in a transfer of assets to lower valued uses. Interestingly, it is the buying firm which absorbs most of this reduction.

Notes

1. These total available gains would be divided between the buying and selling firm through the negotiation of a price for the assets.
2. This study examines only gains to equity holders in the two firms (buyer and seller) engaging in a transaction and ignores any effect on bondholders. [Brown, James, and Mooradian \(1994\)](#) find abnormal bond returns on announcement of a sale by a distressed firm to be insignificantly different from zero. [Datta and Iskandar-Datta \(1996\)](#) report losses for bondholders. In the former case, the equity gains represent the majority of the true gains to the transaction. On the other hand, if bondholders do suffer significant losses, this serves to reinforce many of the qualitative conclusions drawn here, as will be seen later.
3. Therefore, for a single transaction it is possible to have different event dates for buyer and seller. This will occur if the seller initially announces its desire to sell the asset, but does not yet have a buyer or if it announces plans to sell the asset to an unnamed buyer.
4. These firms consist of depository institutions, nondepository credit institutions, security and commodity brokers, insurance.
5. Of the 422 observations, 48 transactions had different event dates for the buying and selling firm. Omission of these observations does not affect the results.
6. We concentrate on the implementation of a new takeover defense rather than classifying firms simply by whether defense mechanisms exist in their charter because institution of a new defense is likely to be more highly correlated with current pressure on the firm from the market for corporate control.
7. The condition of two or more previous sales constituting a program is arbitrary. However, it would seem reasonable as [Mayers and Singh \(1992\)](#) find that the median time from a program announcement until the first actual sale is 70 trading days and the median time until the third sale is 254 trading days.
8. For the regression on total equity CAR, the variable was equal to price divided by the two firms' total assets if a price was reported.

9. The regression on total CAR was also estimated controlling for the log of the total market value of equity of the two firms. The results were unchanged.
10. The tests for differences between buying and selling firms were also run using matched sample tests (including only those transactions for which financial data were available for both firms) and the results are identical.
11. The interest coverage ratio calculations do not include firms reporting an interest expense of zero (1 seller, 7 buyers).
12. In three cases, the firm instituted a defense and was also the subject of a takeover threat.
13. Two buyers fall in both the “defense” and the “threat” categories.

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Appendix A

Let R_{it} be the return to firm i on date t and R_{mt} be the return to the CRSP equally weighted index on date t . The abnormal return for firm i on date t is defined as $AR_{it} = R_{it} - R_{mt}$. The cumulative abnormal return for firm i for dates $t = b$ to $t = e$ is then

$$CAR_{i,(b,e)} = \sum_{t=b}^e AR_{i,t}.$$

The standardized abnormal return for firm i on date t is defined as

$$SAR_{it} = \frac{AR_{it}}{\hat{\sigma}_{AR_{it}}},$$

where

$$\hat{\sigma}_{AR_{it}} = \sqrt{\sum_{j=t-240}^{t-11} (AR_{ij} - \overline{AR}_{it})^2 \frac{1}{228}},$$

and

$$\overline{AR}_{it} = \frac{1}{229} \sum_{j=t-240}^{t-11} AR_{ij}.$$

The average standardized abnormal return across N firms for date t is defined as

$$ASAR_t = \frac{\sum_{i=1}^N SAR_{it}}{N}.$$

The test of the null hypothesis of no reaction to the event is based upon the cumulative average standardized abnormal return over a window from $t = b$ to $t = e$

$$\text{CASAR}_{b,e} = \sum_{t=b}^e \text{ASAR}_t.$$

It can be shown that, if stock returns are assumed to be normally distributed, then under the null hypothesis

$$\text{CASAR}_{b,e} \left[\frac{N}{e - b + 1} \right]^{1/2} \sim N(0, 1),$$

for large N .

Tests for significant differences in mean CARS between two subsamples are conducted using the following statistic, which is also assumed unit normal

$$\frac{\text{CASAR}_1 - \text{CASAR}_2}{[(e - b + 1)/N_1 + (e - b + 1)/N_2]^{1/2}}.$$

Tests on the significance of total equity CARS are analogous to those for the individual firms. Because it is possible that buyer and seller CARS are not independent in the event period, total equity CARS were also standardized using an estimated variance including a term to reflect the cross-sectional covariance of buyer and seller CARS. The results under this method of standardization are almost identical to those presented in the paper.

References

- Bhagat, S., Shleifer, A., & Vishny, R. (1990). Hostile takeovers in the 1980s: The return to corporate specialization. *Brookings papers on economic activity—microeconomics*, 1–84.
- Brown, D., James, C., & Mooradian, R. (1994). Asset sales by financially distressed firms. *Journal of Corporate Finance*, 1, 233–257.
- Brown, S., & Warner, J. (1980). Measuring security price performance. *Journal of Financial Economics*, 8, 205–258.
- Brown, S., & Warner, J. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics*, 14, 3–31.
- Datta, S., & Iskandar-Datta, M. (1996). Who gains from corporate asset sales? *Journal of Financial Research*, 19, 41–58.
- Donaldson, G. (1990). Voluntary restructuring: The case of general mills. *Journal of Financial Economics*, 27, 117–141.
- Hearth, D., & Zaima, J. (1984). Voluntary corporate divestitures and value. *Financial Management*, 13, 10–16.
- Jain, P. (1985). The effect of voluntary sell-off announcements on shareholder wealth. *Journal of Finance*, 40, 209–224.
- John, K., & Ofek, E. (1995). Asset sales and increase in focus. *Journal of Financial Economics*, 37, 105–126.
- Klein, A. (1986). The timing and substance of divestiture announcements: Individual, simultaneous and cumulative effects. *Journal of Finance*, 41, 685–696.
- Loh, C., & Rathinasamy, R. S. (1997). The impact of antitakeover devices on the valuation consequences of voluntary corporate selloffs. *The Financial Review*, 32, 691–708.
- Mayers, D., & Singh, V. (1992). *Divestiture program announcements: Wealth effects, redistributions and structure of corporate debt* (Working paper). Ohio State University.

- Pulvino, T. (1998). Do asset fire sales exist? An empirical investigation of commercial aircraft transactions. *Journal of Finance*, 53, 939–978.
- Rosenfeld, J. (1984). Additional evidence on the relation between divestiture announcements and shareholder wealth. *Journal of Finance*, 39, 1437–1448.
- Sicherman, N., & Pettway, R. (1987). Acquisition of divested assets and shareholder wealth. *Journal of Finance*, 42, 1261–1273.
- Sicherman, N., & Pettway, R. (1992). Wealth effects for buyers and sellers of the same divested assets. *Financial Management*, 21, 119–128.
- Zaima, J., & Hearth, D. (1985). The wealth effects of voluntary sell-offs: Implications for divesting and acquiring firms. *Journal of Financial Research*, 8, 227–236.