ASSESSING COMPETITION
IN THE MARKET
FOR CORPORATE ACQUISITIONS

by

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Comments invited.

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ASSESSING COMPETITION IN THE MARKET FOR CORPORATE ACQUISITIONS

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Abstract

Several empirical studies of mergers and tender offers examine the changes in the value ownership claims associated with corporate acquisitions and use the observed value changes to address the degree of competition in the market for corporate acquisitions. These studies conclude that the takeover market is competitive on the basis of the abnormal stock price changes of bidding firms, the time series behavior of the market value of target firms, and the proportion of gains that accrue to target and bidding firms. Unfortunately, none of these tests are sufficient to conclude that the takeover market is competitive. A competitive acquisition market implies that the potential gain to unsuccessful bidders at the successful offer price is nonpositive. This implication is tested using data on tender offers in which there are multiple bidders. The results appear to be consistent with competition in the market for corporate acquisitions.
1. Introduction

Economists are concerned about competition in the corporate acquisition market for at least three reasons. First, perfect competition in the market for corporate acquisitions is often advanced as the solution to the conceptual problems associated with the separation of ownership and control. In a competitive acquisitions market, firms that do not maximize market value are acquired and a value maximizing strategy is instituted. Second, a competitive acquisitions market assures efficient resource allocation. Since anti-trust laws presumably eliminate takeovers motivated by monopolization, efficient resource allocation occurs when assets are used in their highest valued application. Third, a competitive acquisitions market eliminates the need for securities regulations such as the Williams Act and state tender offer laws that "protect" target shareholders because the price of the target firm is bid up to its "fair value" in a competitive takeover market.

In spite of the importance of a competitive acquisitions market, the concept has not been defined in detail. The microeconomic definition of a competitive market focuses on firms which face infinitely elastic demand curves for homogeneous products. This definition does not apply to the takeover market because bidding and target firms are heterogeneous. In this paper competition in the acquisitions market is characterized in terms of the gain that accrues to potential bidding firms: in a competitive acquisitions market the price of the target firm rises until the acquisition is a negative

\footnote{For example, see Manne (1965), Smiley (1975), and Fama (1978).}
net present value investment for all unsuccessful bidders.

This concept of a competitive acquisitions market captures the notion of rivalry among bidding firms. In this market, each potential bidder evaluates the target and advances a bid if it is advantageous to do so. This process continues and offer price is bid up until the takeover would be a negative net present value investment for the unsuccessful bidders. Since all firms, including firms which did not actually advance a bid, are potential bidders, the concept of a competitive takeover market means that even if only one bid is observed for a given target, the bid price ensures that no gains are available to any other potential bidder at the bid price.

The definition of a competition acquisitions market requires bidders to take advantage of all profitable takeover opportunities. The hypothesis of a competitive acquisitions market would be reject if positive net present value takeover bids are not advanced. This can occur for at least four reasons: bidders collude, unsuccessful bidders act irrationally, entry restrictions prohibit positive net present value bids, and strategic behavior by bidders. If several bidders formed a cartel and only one member of the cartel bid for a given target, the exclusion of other members of the cartel could reduce the acquisition price. The value of target could exceed the acquisition price for non-bidding members of the cartel and thereby violating the condition for a competitive takeover market. Similarly governmental entry restrictions such as anti-trust laws could exclude firms which value the target firm more than the successful offer price.  

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1An example of this type of entry restriction is the Justice Department's request for additional information from Mobil during the Conoco takeover. This request prohibited Mobil from buying Conoco common stock and essentially prevented Mobil from actively competing with DuPont and Seagram even though Mobil's offer was the highest. See Ruback (1982) for additional information on this takeover.
Irrational behavior by bidding firms could also lead to rejection of the competitive acquisitions market hypothesis. Evidence presented in Dodd (1981) shows that the stock prices of successful bidding firms decline. This suggests that these bidders act irrationally by bidding too much for the target firms. This type of irrational behavior, however, is not inconsistent with the hypothesis since no restrictions are placed on the gains to successful bidders. The hypothesis is rejected if unsuccessful bidders do not match competing bids when the takeover would be a positive net present value investment at the higher price. This failure to make positive net present value takeovers could be due to either irrationality or strategic behavior by unsuccessful bidders. Strategic behavior occurs when bidders use information about other bidders to determine their takeover strategy. For example, suppose that firm U believes that a target is worth more to its rival bidder, firm S, than it is to firm U. Firm U could rationally choose not to bid because it believes firm S will be the successful acquirer. This behavior is inconsistent with the hypothesis of a competitive acquisitions market because the price of the target is not bid up until the takeover is a negative net present value investment for unsuccessful bidder.

Several empirical studies of mergers and tender offers examine the changes in the value of ownership claims associated with corporate acquisitions and use the observed value changes to address the degree of competition in the market for corporate acquisitions. Mandelker (1974) and Asquith (1982) argue that the lack of significant positive abnormal performance on average for bidding firms is consistent with perfect competition in the acquisitions market. This evidence is consistent a competitive takeover market if all bidders value the target equally. It is not, however, a direct test of competition in the acquisition market since the potential gains to
unsuccessful bidders are not examined. Their tests do not demonstrate that the successful offer price exhausts the potential gains for unsuccessful bidders.

Ellert (1976) presents data which is inconsistent with Mandelker's findings. Ellert finds that bidding firms realize significant positive abnormal returns from mergers. Also, Ellert uses the behavior of the common stock return of acquired firms to infer competition in the acquisition market. Specifically, he notes that while acquired firms gain over the seven months preceding the merger, these gains are offset by prior abnormal losses. He concludes that these results are consistent with competition in the acquisitions market since the acquired firms receive "the value of the asset bases under more efficient management." Ellert's evidence is consistent with the payment of premiums by bidding firms, but does not imply a competitive acquisitions market because the hypothesis does not restrict the premium to be equal to the replacement cost of the target's assets.

Other authors, for example, Dodd and Ruback (1977) and Bradley (1980) examine the equity value changes associated with tender offers. These papers attempt to infer the degree of competition in the acquisitions market by noting that the positive abnormal return is higher for target firms than it is for bidding firms. In a competitive acquisition market, both bidding and target firms can realize positive abnormal returns. The definition of a competitive takeover market implies that the gains to the successful target are bounded by zero and the difference between the value of the target to the successful bidder and the target's next highest value use. The proportion of gains which accrue to the bidder and target, however, provides no basis for assessing competition in the acquisitions market since any split is feasible.

Competition in the takeover market cannot, in general, be assessed by
examining the stock market reaction of the successful bidding and target firms. An alternative method of assessing competition in the acquisitions market, developed in Section 2, focuses on the potential gains to unsuccessful bidders from matching the successful offer price. Under the hypothesis of a competitive takeover market, this potential gain should be non-positive. The hypothesis is tested using a sample of 48 unsuccessful tender offers which is described in Section 3. The empirical results presented in Section 4 are consistent with a competitive takeover market.

2. A Procedure for Testing Competition in the Takeover Market

The test of competition in the acquisitions market examines the hypothesis that the successful bid price exhausts all potential gains for every unsuccessful bidder. The test therefore requires an estimate of the net present value of the acquisition for unsuccessful bidders at the successful offer price. While actual competition for a given target in the form of competing bids is not required by the definition of a competitive takeover market, these competing bids provide the basis for testing the hypothesis.\(^1\)

The potential gain for the unsuccessful bidder (firm \(u\)) from making a takeover offer at any given price \(P_S\) can be measured as

\[ G_{u_s} = G_{u} - (P_S - P_u) \quad . \]

\(^1\)Basing the test on takeovers in which there are competing bids seems to bias the test in favor of the hypothesis since Fama and Laffer (1972) show that two noncolluding firms are sufficient for competition but one firm is not. However, unless entry restrictions prohibit competing bids in uncontested takeovers, the lack of bids in uncontested tender offers does not indicate a lack of competition. Rather, it indicates that the initial offer price exhausted all potential gains for other bidders.
That is, the potential gain to firm \( u \) from making a bid of \( P_s \) is the net present value of the takeover if it was successful at \( P_u \) less the larger cash outflow from the higher offer price. For example, the gain from a successful offer at \( P_s \) could be evaluated by estimating \( G_u(0) \), the gross present value of the takeover, less the acquisition costs \( P_s \). This construction highlights the requirement for a measure of the gains to the unsuccessful bidder from making an offer at some price; the methodology requires an observation for \( G_u(P_u) \) for the unsuccessful bidder.

When there is explicit competition between bidders for a given target, the gain at the lower unsuccessful offer price for the unsuccessful bidder can be estimated. If the bid of \( P_u \) by the unsuccessful firm is unanticipated and the market presumes that the bid will be successful, \( G_u(P_u) \) can be measured as the increase in the equity value of firm \( u \) associated with its bid of \( P_u \) and \( G_u(P_s) \) can be expressed in terms of observable data.

More specifically, suppose that equilibrium security returns are described by the market model,\(^1\)

\[
\tilde{r}_{jt} = \alpha_j + \beta_j \tilde{r}_{mt} + \tilde{\epsilon}_{jt} \tag{2}
\]

where

\( r_{jt} \) = continuously compounded rate of return of security \( j \) over day \( t \)

\( r_{mt} \) = continuously compounded rate of return of a value weighted market portfolio over day \( t \)

\( \beta_j \) = covariance \( (\tilde{r}_{jt}, \tilde{r}_{mt})/\text{variance}(\tilde{r}_{mt}) \)

\( \alpha_j = E(\tilde{r}_{jt}) - \beta_j E(\tilde{r}_{mt}) \)

---

\(^1\)See Fama (1976) for description of this model.
\[ \varepsilon_{jt} = \text{disturbance term of security } j \text{ on day } t \text{ and } \mathbb{E}(\varepsilon_{jt}) = 0 \]

The market model (2) is estimated on 300 daily observations over the period 408 trading days before the takeover announcement through 108 days before the announcement.\(^1\) These coefficient estimates are used to predict equilibrium returns around the announcement of a takeover and the prediction errors, (actual returns less predicted returns) proxy for abnormal returns.

Under the assumptions that the tender offer is unanticipated and the market presumes that the offer will be successful, the net present value of the offer is measured as

\[ G_u(P_u) = \mathbb{E}_{t-1} \cdot \text{PE}_t \] (3)

where \( \mathbb{E}_{t-1} \) is the equity value on the day before the announced offer and \( \text{PE}_t \) is the prediction error on the announcement day.

Previous empirical work indicates that the announcement of a tender offer is anticipated. For example, the results of Bradley (1980) suggest that information leakage regarding a tender offer occurs over the five days before the \textbf{Wall Street Journal} announcement. This leakage is incorporated into the analysis by summing the prediction errors over the period five days before the announcement through the announcement day. Defining this sum as \( \text{CPE}_{t-5,t} \), the cumulative prediction error from \( t-5 \) through \( t \), the gain is estimated as

\[ G_u(P_u) = \mathbb{E}_{t-6} \cdot \text{CPE}_{t-5,t} \] (4)

\(^1\)Since the last trades of common stocks occur at different times, nonsynchronous trading problems are present in daily stock return data. Scholes and Williams (1977) show that this causes bias in market model coefficients and present efficient estimators of the coefficients. This paper uses these efficient coefficient estimators.
A remaining difficulty in measuring the potential gains for unsuccessful bidders is that it is unlikely that the market presumes that every tender offer will be successful. The abnormal change in equity values, therefore, measures the expected gain to the bidder. Defining \( \pi_s \) as the probability that a given offer will be successful, and abstracting from transactions costs, the measured change in equity values is,

\[
E_{t-6} \cdot CPE_{t-5,t} = \pi_s G(P_u) \cdot
\]

(5)

Substituting the value of \( G_u(P_u) \) in (5) into (1) yields

\[
G_u(P_s) = \frac{E_{t-6}CPE_{t-5,t}}{\pi_s} - (P_s - P_u) \cdot
\]

(6)

The potential gain to the unsuccessful bidder at the successful offer price, \( G_u(P_s) \), involves the probability that the offer at \( P_u \) will be successful. Unfortunately, I know of no procedure to estimate \( \pi_s \). However, since \( \pi_s \) is between zero and one, the observed changes in equity values provide a bound on \( G_u(P_s) \), and therefore provide a means of testing the hypothesis. If the abnormal change in the equity value of the unsuccessful bidder is negative, values of \( \pi_s \) less than one makes \( G_u(P_s) \) smaller whereas if the abnormal change in equity value is positive, values of \( \pi_s \) less than one makes \( G_u(P_s) \) larger. For a competitive takeover market, \( G_u(P_s) \) should be less than zero. Thus, if the abnormal equity value change is positive and greater than the difference between the successful and unsuccessful offer price, \( P_s - P_u \), the data will be inconsistent for any value of \( \pi_s \) between zero and one. Similarly, if the data are consistent with a competitive acquisitions market
when abnormal change in equity values is negative, the data will be consistent for any value of $\pi_s$. For observations in which the abnormal change in the equity value of the unsuccessful bidders is positive but less than the difference between the successful and unsuccessful offer prices $G_u(P_s)$ will be negative if $\pi_s$ equals one, but will be positive for a sufficiently small value of $\pi_s$. The $\pi_s$ which equates $G_u(P_s)$ to zero is a critical value since values of $\pi_s$ below it make $G_u(P_s)$ positive and inconsistent with the hypothesis. These critical values can be calculated from (6).

3. Data

The test of rivalry in the acquisitions market requires competing bids for target firms. The empirical tests, therefore, examine interfirm tender offers. These data are particularly well suited for this test because the competitive bidding is accomplished by the public announcements of offers.

The data are derived from the tender offer samples used in Dodd and Ruback (1977), Bradley (1980) and 14D-1 filings published in the SEC News Digest. The following criteria are used to select a subset of tender offers which are appropriate for this application:

1) There must be at least two bidders for the same target;
2) The tender offer must be for control of the target;
3) There must be a clear victor among the bidders. Offers in which all bidders are unsuccessful are excluded;
4) Sufficient information must be available to value the first unsuccessful offer and the successful offer;
5) Bidders prohibited from acquiring the targets by anti-trust authorities are excluded;
6) The unsuccessful bidder must be listed on the New York or American Stock Exchanges and the offer must be after July 1, 1962.

The first five criteria are required by the structure of the test and the sixth requirement enables the use of the CRSP daily return files.\(^1\) This selection process results in a sample of 48 unsuccessful bidders.

The first bid by the unsuccessful bidder preceded the first bid by the successful bidder in 75 percent of the takeovers in the sample. The successful offers were, on average, 13 percent greater than the initial offer by the unsuccessful bidders. In all cases the most valuable outstanding offer was accepted by the target shareholders.

4. Empirical Results

4.1 An Overview

Tables 1 and 2 summarize the abnormal returns associated with the announcement of tender offers by the 48 unsuccessful bidders in the sample. Table 1 presents the cumulative average prediction errors for event related time periods. These cumulative average prediction errors, which proxy for abnormal returns, are calculated by averaging the individual firm prediction errors on each event day across firms, and summing these average prediction errors over event time. Table 2 contains the frequency distribution of the event period abnormal performance.

The first line of Table 1 indicates that shareholders of unsuccessful bidding firms realize, on average, a small insignificant abnormal return of

\(^1\)Center for Research in Security Prices, University of Chicago.
-0.38 percent over the event period with a t-statistic of -0.63. On the
day of the public announcement (ED) these bidding firms earn 0.14 percent
which is also insignificantly different from zero. The data in Table 1
indicate that, on average, no abnormal returns are associated with
unsuccessful takeover bids. This result, while ostensibly consistent with
the announcement month 0.6 percent abnormal return for unsuccessful bidders
reported in Dodd and Ruback (1977), is somewhat surprising. Studies of
mergers by Dodd (1981) and Asquith (1982) indicate that the announcement day
abnormal returns for successful and unsuccessful bidders are similar. This
suggests that the market does not distinguish between successful and
unsuccessful offers until the post-announcement information regarding the
outcome of the offer is released. Since Dodd and Ruback (1977) use monthly
data, it is likely that some of the post-announcement information is
incorporated into their event month abnormal return. The anticipated pattern
of daily abnormal returns in Table 1, therefore, is a positive prediction
error on the event day since Dodd and Ruback (1977), Kummer and Hoffmeister
(1978) and Bradley (1980) report positive abnormal returns for successful
bidders and negative abnormal returns following the announcement as the
information about the outcome of the offer is released. Instead of this
anticipated pattern, Table 1 indicates that no significant abnormal returns

\[ T = \frac{\text{CAPE}_{t_1, t_2}}{\sqrt{T} \cdot \text{Var}(\text{APE}_t) + 2(T - 1) \cdot \text{Cov}(\text{APE}_t, \text{APE}_{t+1})} \]

where \( T = t_2 - t_1 + 1 \). The covariance term in the measure of the
standard deviation adjusts for the first order serial dependence in the
average prediction errors from the Scholes and Williams Market Model. The
variance and covariance of the prediction errors are estimated using 48
prediction errors over the period \( t-108 \) through \( t-61 \).
are associated with either the announcement of the offer or the subsequent failure of the offer.

Table 2 contains the frequency distribution of the event period abnormal returns for the 48 unsuccessful bidders. While the average event period abnormal return is insignificantly different from zero, the frequency distribution in Table 2 indicates that the announcement of a tender offer has an impact on stock prices. In the absence of an announcement effect, the event period abnormal returns ought to be approximately normally distributed about zero. Table 2 shows that event period abnormal returns are dominated by large positive and large negative observations: 67% of the observations exceed 2% in absolute value. The average event period abnormal return for the 19 positive observations is 5.38 percent with a t-statistic of 5.89 and the average event period abnormal return for the 29 negative observations is -4.15 percent with a t-statistic of -6.98. However, the apparent departure from normality is due to the large cross-section standard deviation of the event period abnormal returns of 6.47 percent. The chi-squared goodness of fit statistic is 9.65 and indicates that hypothesis that the event period abnormal returns are normally distributed cannot be rejected at 95 percent level of confidence.
Table 1
Percentage Cumulative Average Prediction Errors for 48 Unsuccessful Tender Offer Announcements

<table>
<thead>
<tr>
<th>Event period</th>
<th>Cumulative Average Prediction Error</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED-5 through ED+a/</td>
<td>-0.38</td>
<td>-0.63</td>
</tr>
<tr>
<td>ED-60 through ED-21</td>
<td>-4.28</td>
<td>-2.79</td>
</tr>
<tr>
<td>ED-20 through ED-11</td>
<td>-0.60</td>
<td>-0.78</td>
</tr>
<tr>
<td>ED-10 through ED-6</td>
<td>-0.88</td>
<td>1.59</td>
</tr>
<tr>
<td>ED-5 through ED-1</td>
<td>-0.52</td>
<td>-0.94</td>
</tr>
<tr>
<td>ED</td>
<td>0.14</td>
<td>0.53</td>
</tr>
<tr>
<td>ED+1 through ED+5</td>
<td>-0.31</td>
<td>-0.56</td>
</tr>
<tr>
<td>ED+6 through ED+10</td>
<td>0.24</td>
<td>0.43</td>
</tr>
<tr>
<td>ED+11 through ED+20</td>
<td>0.33</td>
<td>0.42</td>
</tr>
<tr>
<td>ED+21 through ED+60</td>
<td>1.90</td>
<td>1.24</td>
</tr>
</tbody>
</table>

a/ ED is the day on which the tender offer was announced in the Wall Street Journal.
Table 2

Frequency Distribution of Event Period Abnormal Performance for the Sample of 48 Unsuccessful Tender Offers\(^a\)

<table>
<thead>
<tr>
<th>Abnormal Performance Range in Percent</th>
<th>Absolute Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0 &lt; X &lt; 20.0</td>
<td>3</td>
<td>6.3%</td>
</tr>
<tr>
<td>5.0 &lt; X &lt; 9.99</td>
<td>5</td>
<td>10.4%</td>
</tr>
<tr>
<td>2.0 &lt; X &lt; 4.99</td>
<td>4</td>
<td>8.3%</td>
</tr>
<tr>
<td>1.0 &lt; X &lt; 1.99</td>
<td>5</td>
<td>10.4%</td>
</tr>
<tr>
<td>0 &lt; X &lt; 0.99</td>
<td>2</td>
<td>4.2%</td>
</tr>
<tr>
<td>-0.99 &lt; X &lt; 0</td>
<td>4</td>
<td>8.3%</td>
</tr>
<tr>
<td>-1.99 &lt; X &lt; -1.0</td>
<td>5</td>
<td>10.4%</td>
</tr>
<tr>
<td>-4.99 &lt; X &lt; -2.0</td>
<td>9</td>
<td>18.8%</td>
</tr>
<tr>
<td>-9.99 &lt; X &lt; -5.0</td>
<td>10</td>
<td>20.8%</td>
</tr>
<tr>
<td>-20.0 &lt; X &lt; -10.0</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>48</td>
<td>100%</td>
</tr>
</tbody>
</table>

\(^a\) The event period is defined as ED-5 through ED, where ED is the day on which the tender offer was announced in the Wall Street Journal.
4.2 A Test of Competition in the Takeover Market

Competition in the acquisition market implies that the price of the target firm rises until it is a non-positive net present value investment for all unsuccessful bidders. Using the methodology described in Section 2, the potential gain from matching the successful offer price is estimated for each of the 48 unsuccessful bidders in the sample. The average potential gain is -$195 million and the average t-statistic is -9.11. These results are consistent with competition in the takeover market since the potential gains are significantly less than zero. However, these results are not sufficient to conclude that the data are consistent with a competitive takeover market for two reasons. First, the average potential gain could be dominated by a few observations. Second, as indicated in Section 2, the potential gain is calculated under the assumption that the market anticipates that each offer will be successful.

Table 3 presents the results in more detail. Recall from Section 2 that when the abnormal change in equity value is negative, the observation is unambiguously consistent with competition in the takeover market. The upper right hand cell of Table 3 indicates that 29 observations fall into this category. For these 29 bids the initial market reaction is negative implying that the offer was not, ex ante, a positive net present value investment. Nevertheless, since these bidders abandoned their offers instead of matching

\[ E_{t-6} \sqrt{T} \cdot \text{VAR}(PE_t^e) + 2(T - 1)\text{Cov}(PE_t^e, PE_{t+1}^e) \]

where \( T \) is the length of the cummulation interval (six days) and the variance and covariance of the prediction errors are estimated using 48 prediction errors over the period \( t-108 \) through \( t-61 \).

\[ 1 \] The standard deviation for the potential gain is estimated as:
Table 3
Frequency of Negative and Positive Potential Gains to Unsuccessful Bidders at the Successful Offer Price, $G_u(P_s)$

<table>
<thead>
<tr>
<th></th>
<th>$G_u(P_s) &lt; 0$</th>
<th>$G_u(P_s) \geq 0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations in which the direction of the inequality does not depend on $\pi_s$</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td>Number of observations in which the direction of the inequality does depend on $\pi_s$</td>
<td>13</td>
<td>0</td>
</tr>
</tbody>
</table>

$a/$ The potential gains to the unsuccessful bidders at the successful offer price is calculated as

$$G_u(P_s) = \frac{E_{t-6}^{CPE_t-5,t} - \pi_s}{\pi_s} - (P_s - P_u)$$

where $E_{t-6}$ is the equity value of six days before the announcement of the unsuccessful bid, $CPE_{t-5,5}$ measures the abnormal stock return of the unsuccessful bidders, $\pi_s$ is the ex-ante probability that the offer will be successful, $P_s$ is the successful offer price and $P_u$ is the unsuccessful offer price. In the calculations summarized in this table, $\pi_s$ is assumed to equal one.

$b/$ The direction of the inequality will not depend on $\pi_s$ when $G_u(P_s)$ based on $\pi_s$ equal to one, and $CPE_{t-5,5}$ are of the same sign.

$c/$ The direction of the inequality will depend on $\pi_s$ when $G_u(P_s)$, based on $\pi_s$ equal to one, and $CPE_{t-5,5}$ are of different signs.
a higher competitive bid, these observations are consistent with a competitive
acquisitions market: the successful offer price (and the original
unsuccessful offer price) exhausted all of the potential gains from the
takeover.

For 6 offers the abnormal change in the unsuccessful bidder's equity value
exceeded the difference between the successful and unsuccessful offer price
(upper left hand cell of Table 3). These observations are unambiguously
inconsistent with a competitive takeover market: in these 6 observations the
unsuccessful bidders did not match the successful offer price even though the
data indicate that the takeover would have been a positive net present value
investment at the successful offer price.\(^1\) The successful offer price,
therefore, did not exhaust the potential gain for the unsuccessful bidders.

In 13 observations the abnormal change in equity value for the
unsuccessful bidder is positive, but less than the difference between the
successful and unsuccessful offer prices. If the abnormal changes in equity
value correctly measures the net present value of the takeover at the
unsuccessful offer price, that is, if the ex ante probability of success was
unity, these observations are consistent with a competitive acquisitions
market. However, if the probability of success was not unity, the measured
change in equity value underestimates the net present value of the
unsuccessful offer. Thus, there is a sufficiently small value of the
probability of success that would make \(G_u(P_s)\) positive and inconsistent
with a competitive acquisitions market. The critical value of the ex ante

\(^1\)If the ex-ante probability of success for these offers was less than
one, the abnormal change in equity value underestimates the gain from the
acquisition making the observations even more inconsistent with a competitive
takeover market.
probability of success, equates \( G_u(P_s) \) to zero and is calculated using (6).

Table 4 presents the frequency distribution of the critical values of the probability of success. All of the 13 observations are consistent with competition in the takeover market if the ex-ante probability of success exceeds 50 percent and 9 observations are consistent with competition for ex-ante probabilities of success above 25 percent. While there is no method to extract a measure of the probability of success for a given tender offer, the proportion of successful and unsuccessful offers reported in Dodd and Ruback (1977) suggests that the unconditional probability of success is about 0.72. It seems plausible to assume, therefore, that firms do not announce tender offers unless the probability of success is at least 50 percent. Under this assumption, all 13 of these observations are consistent with competition in the takeover market.

In summary, the results appear to be consistent with competition in the takeover market. On average, the successful offer price exhausts the potential gains for unsuccessful bidders. Furthermore, 88 percent of the individual observations are consistent with competition in the takeover market. In the 48 unsuccessful tender offers examined, 29 are unambiguously consistent with competition, 13 are consistent with competition if the probability of success exceeds 50 percent and only 6 observations are unambiguously inconsistent with competition. Thus, it appears that the market for corporate acquisitions is competitive.
Table 4

Critical Values of the Probability of Success for the 13 Observations Whose Consistency With Competition in the Takeover Market Depends on the Probability of Success, $\pi_S$

<table>
<thead>
<tr>
<th>Probability of Success, $\pi_S$</th>
<th>Absolute Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.0 &lt; \pi_S &lt; .75$</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>$.75 &lt; \pi_S &lt; .50$</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>$.50 &lt; \pi_S &lt; .25$</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>$.25 &lt; \pi_S &lt; .00$</td>
<td>9</td>
<td>69%</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>100%</td>
</tr>
</tbody>
</table>

Notes:
The critical value of the probability of success is

$$\pi = \frac{E_{t-6} \cdot CPE_{t-5,t}}{P_S - P_u}$$

where $E_{t-6}$ is the equity value of six days before the announcement of the unsuccessful bid, $CPE_{t-5,t}$ measure the abnormal stock return of the unsuccessful bidders, $\pi_S$ is the ex-ante probability that the offer will be successful, $P_S$ is the successful offer price and $P_u$ is the unsuccessful offer price.
5. Summary and Conclusion

This paper empirically examines the hypothesis that the market for corporate acquisitions is competitive. Unlike previous studies, the abnormal returns of bidding and target firms are not used to test the hypothesis because competition in the acquisitions market does not have any unambiguous implications for abnormal returns. An implication of a competitive market is that the successful offer price exhausts the potential gains for unsuccessful bidders.

For a sample of 48 unsuccessful bidders the potential gain from matching the successful offer prices is calculated as the abnormal equity value change associated with the announcement of the unsuccessful bid less the difference between the successful and unsuccessful offer. The average potential gain is significantly less than zero. Also, the potential gain is negative in 88 percent of the observations. This evidence suggests that the successful offer price exhausted the potential gain for unsuccessful bidders and is consistent with competition in the corporate acquisitions market.
References


