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Abstract

Although takeover premiums are large, only two percent of twelve thousand bidders initiating control contests for publicly traded targets acquire target shares (toehold) shortly prior to the bid. We argue that, because toeholds deter competition, toehold-bidding may trigger target resistance. If resistance simply means withholding a termination agreement, it takes a toehold of eight percent to compensate for the opportunity loss of a typical agreement. As predicted, we find that toehold-bidding is significantly more likely when this implied toehold threshold is low. Toehold costs may also arise when target resistance eliminates all bids. We show, however, that the expected marginal toehold effect is positive because toeholds increase the probability of success. Finally, toehold purchases may cause a pre-bid target stock price runup and increase total takeover costs (markup pricing). However, we find that bidder gains are increasing in both the *target* runup and in the toehold. We conclude that friendly bidders appear to abstain from toeholds primarily to avoid toehold-induced target resistance.

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1 Introduction

Bidders getting ready to launch a takeover bid have private information about an event that will substantially increase the value of the target shares. With takeover premiums typically in the range of 40 to 60 percent, the case for acquiring target shares (a toehold) in the market prior to launching the bid is compelling. Concerns with illiquidity and information disclosure likely limit the optimal short-term toehold, but hardly to zero.[1] Auction theory also suggests that toehold-bidding is beneficial for the bidder because it helps deter rival bids. Yet, as reported in this paper, over the past three decades only *two* percent of more than twelve thousand bidders initiating a control contests for publicly traded U.S. target firms chose to purchase a toehold shortly (within six months) prior to making the offer. Less than eleven percent bid with any toehold, held long- or short-term. The reverse is also true: In a sample of ten thousand toehold acquisitions, only four percent lead to a follow-on control bid by the same bidder within two years. For the vast majority of firms acquiring toeholds, the investment is followed by a multi-year block holding in the target—not a control bid.

The near-absence of short-term toehold bidding represents a serious challenge to standard bidding theory. We examine three potential sources of toehold costs in order to resolve this toehold puzzle. First, approaching with a toehold may be viewed as aggressive by the target and therefore jeopardize friendly merger negotiations. The reason is that the toehold provides a direct advantage vis-a-vis rival bidders in the event that negotiations break down and the bidder launches a hostile tender offer. Approaching the target with a toehold is therefore tantamount to "let's negotiate—or else", which may trigger target resistance costs. We examine this hypothesis using the loss of a target termination agreement as a proxy for resistance costs. Given optimal bidding, we derive the toehold size that would be required to replace this opportunity loss. The data shows that toehold bidding is significantly more likely to be observed when this implied toehold is relatively low. Consistent with the resistance argument, we also document that the frequency of zero-toehold bidding is greater in friendly than in hostile takeovers, and greater in contests initiated by merger negotiations than by a tender offer.

[1]Even for toehold acquisitions exceeding 5%, which trigger 13d filings, the bidder has a ten-day window to file the disclosure form with the SEC. Also, the Department of Justice and the Federal Trade Commission tend to delay publication of merger pre-notifications required under the Hart Scott Rodino Act (for the purpose of antitrust review).

The second hypothesis for toehold costs extends the target resistance arguments to *all* bidders, toeholds or not. Here, the focus is on the return on the toehold investment when no bidder wins the target. For example, in the model of Goldman and Qian (2004), bidder elimination produces a target price decline that is increasing in the initial bidder's toehold. Surprisingly, as many as one-third of all contests initiated by a friendly merger bid result in the no-bidder-wins outcome. Moreover, target abnormal return are significantly negative over the contest period when all bids are rejected following an initial merger offer. However, the marginal impact of toehold-bidding is positive. As shown also by Walkling (1985), Jennings and Mazzeo (1993), and Betton and Eckbo (2000), toehold-bidding reduces the probability of the no-bidder-wins outcome. We further show that this effect in turn causes the expected abnormal bidder return—conditional on a toehold—to be positive. Thus, we conclude that the prospect of negative target returns in the no-bidder-win state is unlikely to resolve the toehold puzzle.

Third, we examine whether the markup-pricing phenomenon identified by Schwert (1996) may explain why bidders are reluctant to purchase toeholds. Schwert (1996) reports that a pre-takeover runup in the target stock price increases the total takeover premium dollar for dollar.[2] Markup pricing results when the bidder associates the target runup with an increase in the target's stand-alone value, as opposed to the value of the target under the bidder's control. Under imperfect information, a rational (Bayesian) bidder places some weight on both sources of the runup. This suggests that an increase in the target runup—possibly following a toehold purchase—increases the bidder's cost of the takeover. Bris (2001) finds that targets are more likely to receive a takeover bid when the runup is low, which he interprets as evidence that markup pricing deters toehold purchases. However, when replicating Schwert's markup regressions, we find that total bidder abnormal returns are *increasing* both in the target runup and in the toehold, which contradicts Bris' interpretation. Thus, we doubt that markup-pricing is a viable explanation for the near-absence of short-term toehold bidding.

Overall, the most plausible interpretation of our evidence is that target resistance, possibly resulting in the loss of a termination agreement, represents the primary source of short-term toehold costs for most bidders. Using the sample average probability of no-bidder-wins outcome, the implied

[2] Define the "markup" as the total takeover premium minus the target pre-offer runup. Schwert's finding is equivalent to the markup being independent of the runup, hence the term "markup-pricing".

toehold is eight percent for a typical breakup fee and twelve percent for a typical lockup option. These implied toehold levels increase further if we add other types of resistance costs, such as the expected dilution from a poison pill. At these toehold levels, it is not unreasonable to expect toehold costs related to market illiquidity and information disclosure to be prohibitive for many bidders.

The paper is organized as follows. Section 2 describes the data sources and the organization of consecutive bids into a takeover contest, and it develops the initial evidence on toehold frequencies. Section 3 presents the theoretical basis for—and empirical tests of—the toehold-resistance hypothesis. The bidder-elimination hypothesis is tested in Section 4, while tests of the markup-pricing hypothesis is found in Section 5. Section 6 concludes the paper.

2 Toehold frequencies in takeover contests

2.1 Sample selection

We start by identifying individual bids, and then group the bids into takeover contests. Our primary data sources for identifying individual bids are Securities Data Corporation (SDC) and Betton and Eckbo (2000). As shown in Table 1, between 1/1980 and 6/2003, SDC contains a total of 58,246 mergers/tender-offers/toehold-acquisitions for US targets. When further restricting targets to be publicly traded, this population is reduced to 25,158 bids. We then searched the SDC's History File and the Wall Street Journal for information on 1,834 cases flagged by the SDC as tender offers over the sample period. This in order to place the SDC tender offers on the same footing as the tender offer sample of Betton and Eckbo (2000) in terms of data quality. This search augmented information on items such as announcement dates, number of bids in the contest, and toeholds, for 1,044 tender offers. 702 SDC tender offers were eliminated as we could not verify the SDC bid information in the Wall Street Journal, leaving a total of 24,456 sample bids from SDC. We then added a total of 1,780 tender offers for control from the Betton-Eckbo sample not already identified by the above SDC procedure.[3] Our final sample of bids therefore numbers 26,105, of which 10,908 are toehold acquisitions and 15,197 are bids for control.

We group all successive bids for the same target into a single takeover contest. We use the term

[3]Of these 1,649 bids, 779 take place in the period 1971-1979. We do not sample mergers from the 1970s.

contest to describe both single-bid and multiple-bid takeovers. The reason is that any initial bid opens up for potential competition ex ante, even if the ex post outcome is a friendly, single-bid merger deal. Figure 1 shows the principal structure of a control contest in event time, designed with a particular focus on decisions by the *initial* bidder (bids after the initial control bid are not shown). The contest event tree has four distinct stages (N is sample size):

S1: *The toehold acquisition decision* (N=10,908 toeholds)

This sample does not condition on prior or subsequent control-bids for the target.

S2 *The initial control bid decision* (N=12,723 initial bids)

The contest starts with the initial control bid. A control bid is the initial bid if there are no other control bids for the same target over the previous six months. The primary categories are as follows:

(i) Initial control bidder with a stage S1 toehold acquisition (N=431 bids).[4]

(ii) Initial control bidder with no stage S1 toehold acquisition (N=12,292 bids).

(iii) No control-bid is made, despite a stage S1 toehold acquisition (N=10,359).[5]

S3 *The merger/tender offer decision* (N=12,723)

There are 9,237 initial merger offers, of which 244 (3%) occur after a stage S1 toehold acquisition. There are 3,485 initial tender offers, of which 187 (5%) are preceded by a stage S1 toehold purchase.

S4 *Final contest outcome* (N=12,723).

A bid is the last in the contest if there are no additional control bids for the same target over the subsequent six months. There are three mutually exclusive outcomes:

(i) The initial bidder wins the contest (N=8,205).

(ii) A rival bidder wins the contest (N=679).

(iii) No bidder wins the contest—target remains independent (N=3,698).[6]

[4]Of the 431 initial bidders, 221 have short-term stage S1 toeholds—acquired within six months of the stage S2 control bid. There are also another 118 toehold acquisitions, not counted as part of the 431, that are the second toehold acquisition by a bidder making control bid for the target.

[5]The is a fourth outcome in the event tree: No toehold acquisition in stage S1 followed by no control bid in stage S2. We do not sample this event.

[6]The outcome classification is based on SDC and information in the Wall Street Journal. The outcome could not be classified in 141 cases. In the majority of the cases where no bidder wins (unsuccessful targets), the SDC

Stage S4 may occur after several bid revisions and/or rival bids (not shown in Figure 1). A contest initiated by a merger offer may end with a successful tender offer or vice versa.

As shown in Figure 1 and summarized in Table 1, the initial control bidder wins the contest in 8,205 (or 65%) of the 12,723 cases, with the success probability being 63% when the initial bid is a merger offer and 70% when the contest starts with a tender offer. The percentage of cases where the rival bidder wins is 5% in the overall sample. The target remains independent (no bidder wins) in the remaining 30% of the sample contests. The no-bidder-wins outcome occurs in 32% of the cases when the initial bid is a merger offer, versus 23% for tender offers. We return to this surprisingly high target failure rate in Section 4 below.

Figure 2 shows the annual distribution of initial merger- and tender offers (Panel A), and the average deal values (Panel B). Recall from above that for the period prior to 1980, our selection procedure samples tender offers only (from Betton and Eckbo (2000)). SDC information on mergers starts in 1980, and from this year on, initial merger offers outnumbers initial tender offers by almost three to one. The greatest frequencies for both offer categories occur in the 1995-2000 period. Deal sizes are similar in initial mergers and tender offers except in 1983–1985 when tender offers are on average three times as large as mergers, and in 1998-2000 when mergers are close to three times the size of tender offers.

While not shown in the figure, the average (median) deal value in the sample of partial acquisitions is \$90 mill. (\$6 mill.). Despite the small fraction (five percent) of the partial acquisitions that eventually lead to a follow-on control bid, the overall number of partial acquisition bids is highly correlated with the number of initial control bids.

2.2 Long- and short-term toehold frequencies

The source of our toehold information is SDC, the Wall Street Journal, and Betton and Eckbo (2000). SDC lists the percent of the target shares held by the bidder both at the time of the bid and six months prior to the bid. We merge this information with the SDC toehold acquisition data in our data base (SDC's primary data source for toehold acquisitions is 13d filings with the SEC). Finally, as Betton and Eckbo (2000), we update the toehold data for tender offers with information

reports that all bids are "withdrawn". In Section 4, below, we discuss in some detail the surprisingly large number of unsuccessful contests initiated by a merger proposal.

in the Wall Street Journal. This gives us three categories of toeholds. The first is the toehold at the initial bid date. The second is the toehold held by the initial bidder six months prior to the initial bid date. The third is the difference between the first and second, i.e., the incremental toehold over the six months leading up to the initial bid—which we label short-term toeholds. We focus in particular on the toehold decision of the *initial* control-bidder, i.e., the first bidder making the first control bid in the contest.

Table 2 shows average toehold sizes of initial bidders, classified by the type of initial control bid (merger/tender offer) and by target hostility to the initial bid.[7]. The "Target not hostile" category covers cases where the target reaction is either neutral or friendly. Focusing on the total sample of contests (first column), 1,444 or 11% of the 12,723 initial bidders have a toehold. The average toehold size (excluding the zero-toehold cases) is a sizeable 21% (median 17%).

Of the 1,444 initial toehold bidders, we have sufficient information on 1,038 to classify the toehold as long-term or short-term. The bulk of the toeholds are long-term: 92% of the toehold bidders have long-term toeholds, with an average long-term toehold size of 21% (median 17%). Table 2 reveals a near-absence of short-term toehold bidding in the overall population of bids: Only 2% of all bidders have a short-term toehold. Of all toehold bidders, 21% have short-term toeholds, with average short-term toehold size of 13% (median 9%). The majority (60%) of short-term toehold bidders also have a long-term toehold.

Table 2 also shows a dramatic difference in toehold frequencies across deal type and target resistance. In friendly deals, 21% of bidders initiating a control contest with a tender offer have a toehold, again large (average size of 24%) and typically long-term (in 94% of the cases). In friendly merger offers the toehold frequency drops to 6%, but toeholds remain large (average size 21%) and mostly long-term (91%). Less than 2% of these bidders have short-term toeholds, whether tender offer or merger.

The toehold frequency increases substantially when the target is hostile—whether the initial deal type is merger or tender offer—and remain largest for tender offers. Across the total sample of initial tender offers, 62% have a toehold, averaging 11% in size and with 97% long-term. For initial merger offers, 31% of bidders have toehold, with an average size of 13%. Interestingly, in

[7] The source of the target reaction information is SDC, the Wall Street Journal, and Betton and Eckbo (2000) for tender offers

this category, the percentage of the toeholds that are long-term falls to 75%, with a corresponding increase in the short-term toehold frequency.

In sum, target hostility drives up the overall toehold frequency and, in the case of merger offers, short-term toeholds. This motivates the focus on the interplay between toeholds and target resistance that is at the core of the subsequent analysis.

3 Toeholds and target resistance

In this section, we derive and test a theoretical prediction linking the toehold decision to target resistance costs. Before providing the full analysis, it is useful to summarize the basic intuition. We model an initial bidder whose objective is to execute a friendly merger. Target management knows that if it refuses the bidder's initial invitation to negotiate, or if negotiations break down following a period of merger talks, then the bidder will launch a hostile tender offer. Since toehold bidding increases the probability that the initial bidder will win this hostile "shadow" auction (shown below), the target may decide to resist the initial attempt to start friendly negotiations with a toehold bidder.

In practice, target resistance may take several forms, ranging from simply being non-cooperative to a full-fledged "war" (e.g. refusing to rescind a poison pill). In Appendix A, we prove a generalized zero-toehold equilibrium proposition based on the existence of resistance costs and target private benefits of control.[8] In this equilibrium, which presumes optimal bidding behavior, it is incentive-compatible for the bidder to approach the target with a zero toehold and for the target management to not resist merger talks. Thus, target resistance costs may deter short-term toehold purchases altogether.

For the purpose of the empirical analysis, we are particularly interested in the non-cooperative case where target resistance means *refusal to grant the bidder a termination contract* (either a target breakup fee or lockup option).[9] The analysis below derives the exact value of this potential

[8]Private benefits of control are sufficient but not necessary for target resistance. For example, the target may simply argue that the toehold bidder already receives compensation from the toehold if it loses the contest to a rival. Also, target management may resist on corporate governance grounds: a short-term toehold is inherently discriminatory since selling shareholders are deprived of the takeover premium. For the same reason, the target typically requires the bidder to sign a standstill agreement before agreeing to start merger negotiations.

[9]A lockup option gives the initial bidder the right to purchase target (treasury) shares at the original merger price if a rival bidder wins the target. These shares may then be sold to the winning rival. A breakup fee is a fixed payment independent of the winning takeover premium, and is typically triggered also if the target remains independent. We

opportunity cost of toehold bidding. We first derive the optimal bids, and then the minimum toehold necessary to reproduce the bidder's expected profits from either a breakup fee or a lockup agreement. We refer to this as the "implied toehold". The lower the implied toehold, the smaller the opportunity cost of toehold bidding, and the greater the probability of observing a bidder toehold. The section ends with empirical tests of this prediction.

3.1 The implied toehold

3.1.1 Optimal bidding: toehold vs. termination fee

To describe the shadow auction, we use a sealed-bid second-price auction setting where the target's pre-auction market value is normalized to zero. Bidding is costless, and we assume the existence of (at least) two risk-neutral bidders with unaffiliated private valuations $v \in [0,1]$. We start by deriving the optimal bid given that the bidder has either a toehold of $\alpha \in [0,1]$, a breakup fee of $t \in [0,1]$ (the bidder receives tv under the contract), or a lockup option which gives the bidder the right to purchase a fraction $l \in [0,1]$ of the outstanding target shares at a pre-determined strike price of p_l.

While optimal toehold bidding has been analyzed extensively in the literature,[10] we present new results for bidding with breakup fees and lockup options. These are summarized in Proposition 1:

Proposition 1 (Optimal bids): *With private bidder valuations distributed i.i.d. and uniform, $v \sim U[0,1]$, the optimal bid p^* is, respectively,*

$$p^* = \begin{cases} v & if\ \alpha = t = l = 0 \text{ (no instrument)} \\ \frac{v+\alpha}{1+\alpha} & if\ \alpha > 0;\ t = l = 0 \text{ (toehold only)} \\ v(1-t) & if\ \alpha = l = 0;\ t > 0 \text{ (breakup fee only)} \\ \frac{v+l(1+p_l)}{1+2l} & if\ \alpha = t = 0;\ l > 0 \text{ (lockup option only)} \end{cases} \tag{1}$$

Proof: With neither a toehold nor a termination agreement, bidding less than v risks losing the target to the rival while bidding more than v is unprofitable. Thus the optimal bid is $p^* = v$. The

also observe bidder termination agreements in mergers. However, since our purpose is to determine the tradeoff between toehold bidding and bidding with a termination agreement, we focus on payments from the target to the bidder only.

[10] E.g., Burkart (1995), Singh (1998), Bulow, Huang, and Klemperer (1999), and Eckbo and Thorburn (2002).

expected profit Π_{toe} of a bidder with toehold α is

$$\Pi = vG(p) - (1-\alpha)\int_0^p p_2 g(p_2)dp_2 + \alpha p[1-G(p)] = (v+\alpha)p - \frac{1}{2}(1+\alpha)p^2, \tag{2}$$

where p_2 is the price offered by the rival bidder (who bids with no instrument), $G(v)$ and $g(v)$ are, respectively, the cumulative and density functions over v, and where the last equality imposes the uniform distribution. The three terms after the first equality are the bidder's expected value conditional on winning, the expected payment for the target conditional on winning, and the expected value from selling the toehold α to the rival bidder when the rival wins the auction. From the first-order condition,[11] the optimal bid p^* is

$$p^* = v + \alpha\frac{1-G(p^*)}{g(p^*)} = \frac{v+\alpha}{1+\alpha}. \tag{3}$$

With a breakup fee, the bidder's expected profit Π_{break} is

$$\Pi_{break} = \int_0^p (v-p_2)g(p_2)dp_2 + tv[1-G(p)] = vp(1-t) + tv - \frac{p^2}{2}, \tag{4}$$

and the first-order condition yields the bid in Proposition 1.[12] Finally, with a lockup option, the bidder's expected profit Π_{lock} is

$$\Pi_{lock} = \int_0^p (v-p_2)g(p_2)dp_2 + l(p-p_l)[1-G(p)] = vp - \frac{p^2}{2} + l(p-p_l)(1-p). \tag{5}$$

The first term to the right of the first equal sign is the payoff when winning and the second term is the payoff when losing the auction. The first-order condition yields the optimal bid.[13] ■

According to Proposition 1, while a toehold bidder optimally overbids ($p^* > v$), the breakup fee lowers the bidder's valuation of the target by tv and thus implies underbidding ($p^* < v$). The intuition for the underbidding result is straightforward. For auction bids greater than $v(1-t)$, the bidder prefers to drop out of the auction and receive tv dollars rather than continue bidding. Interestingly, this also means that the breakup fee lowers the probability that the initial bidder

[11] $\partial\Pi_{toe}/\partial p = \alpha[1-G(p)] + (v-p)g(p) = 0$

[12] $d\Pi_{break}/dp = (v-p)g(p) - tvg(p) = 0.$

[13] $d\Pi_{lock}/dp = (v-p)g(p) + l[1-G(p)] - l(p-p_l)g(p) = 0$, which implies $p^* = \frac{1}{1+l}[v + lp_l + l\frac{1-G(p)}{g(p)}]$, which in turn reduces to the optimal bid in Proposition 1 for the uniform distribution.

will win the auction. In effect, the fee coerces the bidder to remain friendly during the merger negotiations. Breakup fees may therefore be viewed as a form of target defensive mechanism. This defense comes in addition to the commonly recognized deterrent effect of the fee on potential rival bidders.

Proposition 1 also implies that a lockup may lead to either over- or underbidding. The lockup implies overbidding if

$$v < p_l + \frac{1 - G(p)}{g(p)}, \quad \text{or when v uniform}: \ v < \frac{p_l + 1}{2}, \tag{6}$$

otherwise, a lockup implies underbidding. The intuition is as follows. If the bidder wins the auction, the lockup does not permit the bidder to purchase target shares at a discount. Here, the toehold has an advantage, since it has been purchased at a price below the winning auction price. The lockup option has value only when the bidder loses to a rival and sells the fraction l of the target shares to the winning rival bidder for a price greater than p_l. A marginal increase of the bid raises the expected auction price conditional on winning (a cost), while at the same time increasing the gain from the lockup option conditional on losing (a benefit). When the probability of losing is high (because v is low), the lockup benefit exceeds the takeover cost at the margin, and it is optimal to overbid ($p^* > v$). Conversely, when the probability of winning is high (because v is high), the takeover cost exceeds the lockup benefit at the margin, and it is optimal to underbid ($p^* < v$).[14]

3.1.2 The toehold opportunity cost

To our knowledge, bidding theory does not deliver predictions on the optimal toehold size.[15] However, it is possible to use the expected profits from optimal bidding with a termination agreement to solve for the toehold threshold that implies the same expected profit. This implied toehold directly

[14]The overbidding resulting from a lockup agreement is smaller than the overbidding with a toehold α as long as

$$p_l < \frac{1}{l(1+\alpha)}(vl + \alpha + (v - l)(l - \alpha)).$$

This condition always holds if the fraction $\alpha = l$. Only for small values of α and v and large values of l and p_l does a bidder overbid more aggressively with a lockup option than with a toehold.

[15]For example, Bulow, Huang, and Klemperer (1999)) emphasize the value of asymmetric toeholds in common-value auctions. Here, even a tiny toehold provides a substantial advantage as long as it exceeds the toehold of rival bidders. There is some empirical evidence to support this argument. Betton and Eckbo (2000) find that in multi-bidder tender offer contests, the rival bidder tends to enter with a toehold similar to the initial bidder (in both cases about 5%). Thus, it appears that rival bidders seek to "level the playing field" in order to enter the auction. Their analysis does not, however, account for substitute forms of bidder payments, such as lockups and breakup fees.

represents the opportunity cost of foregoing a termination agreement by triggering target hostility.

Breakup fees provide the bidder with a positive payoff even if no bidder wins the target, which is not the case for toeholds or lockup agreements. If no bidder wins, the toehold bidder does not get to sell the toehold to a winning rival. Thus, to compute the equivalent toehold implied by a termination agreement, we need to also account for the different payoff in the no-bidder-wins state. Suppose that the target is unsuccessful (no bidder wins) with an exogenous probability of $\theta \in [0,1]$, and that the toehold and lockup option payoff in the target-unsuccessful state is zero.[16] With these assumptions, the optimal bids in Lemma 1 remain unchanged. The expected profits and the implied toehold threshold are summarized in Proposition 2:

Proposition 2 (Implied toehold): *For an exogenous probability θ that no bidder wins the auction, bidding with a toehold of $\hat{\alpha}$ produces an expected profit equal to that of bidding with a breakup fee of t, where*

$$\hat{\alpha} = \frac{\Pi_{break}}{1-\theta} - v + \sqrt{(\frac{\Pi_{break}}{1-\theta})(2(1-v) + \frac{\Pi_{break}}{1-\theta})}, \tag{7}$$

and where Π_{break} is the expected profit from bidding with a breakup fee.

Proof: The expected profits, and therefore $\hat{\alpha}$, follow directly when applying the optimal bids in Proposition 1. Specifically, the expected bidder profits are

$$\Pi = \begin{cases} \frac{1}{2}(1-\theta)v^2 & if\ \alpha = t = l = 0 \text{ (no instrument)} \\ \frac{1}{2}(1-\theta)\frac{(v+\alpha)^2}{1+\alpha} & if\ \alpha > 0;\ t = l = 0 \text{ (toehold only)} \\ \frac{1}{2}(1-\theta)\ v^2(1-t)^2 + tv & if\ \alpha = l = 0;\ t > 0 \text{ (breakup fee only)} \\ \frac{1}{2}(1-\theta)\ [\frac{(v+l+lp_l)^2}{1+2l} - 2lp_l] & if\ \alpha = t = 0;\ l > 0 \text{ (lockup option only).} \end{cases} \tag{8}$$

■

As shown in Panel A of Figure 3, bidder expected profits are decreasing in the probability θ regardless of the instrument. For low values of θ, a lockup option with $l = 20\%$ and $p_l = 0$ yields the highest expected profits. For high values of θ, a termination fee of $t = 6\%$ dominates since this strategy gives a payoff of tv to the bidder also when the target remains independent. Notice that

[16] I.e., when unsuccessful, the target share price falls back to its initial value of zero, which is also the toehold purchase price.

a toehold strategy with $\alpha = 5\%$ is always dominated by one of the termination agreements. The lowest expected profits are associated with bidding without a toehold or termination agreement.

Panel B of Figure 3 plots the implied toehold $\hat{\alpha}$ for an average bidder ($v = 0.5$) as a function of θ. The figure assumes that the alternative contractual arrangement is either a lockup option with $l = 20\%$ and $p_l = 0$ (gray line), or a breakup fee of $t = 6\%$ (black line). For the lockup alternative, the implied toehold does not vary much with θ, reflecting the fact that neither the toehold not the lockup pays off when the target remains independent. For the case of a breakup fee, however, the implied toehold increases sharply with θ because the fee is payable also when the target remains independent. Thus, the relative advantage of a breakup fee (and therefore the opportunity cost of the toehold) is high when θ is high. For example, if the value of θ is 30%, which is close to the unconditional sample average below, $\hat{\alpha} = 8\%$. Toehold purchases of this size may well be prohibitive due to costs of market illiquidity and forced information disclosure which are not present for lockups or breakup fees.

Note also that the implied toehold is greater than shown in Panel B of Figure 3 if there are additional target resistance costs such as the expected dilution from a poison pill. Thus, the value of $\hat{\alpha}$ in Proposition 2 represents a lower bounds on the actual break-even levels of the toehold. As indicated above, we prove a more general zero-toehold bidding proposition (Proposition 3) in the Appendix. In Proposition 3, the bidder continues to trade off expected toehold benefits with resistance costs. However, the proposition explicitly accounts for the incentives of the target. Target management owns target stock and enjoy private benefits of control. Thus, target management more generally trades off the share-price benefit of overbidding by the toehold bidder with the expected loss of private benefits of control when the hostile bidder wins. As shown in the Appendix, for certain parameter values, it is incentive-compatible for the target not to resist a zero-toehold bidder. In this case, zero-toehold bidding constitutes an equilibrium strategy for the bidder.

3.2 Testing the toehold-resistance hypothesis

Under the toehold-resistance hypothesis, bidders select zero toeholds in order to avoid target resistance costs. To test this proposition, we proceed in two steps. The bidder is assumed to jointly determine the toehold, the probability of receiving a termination fee, and the offer premium. In the first step, we capture the interaction between these three decisions using a system of three equations that are estimated simultaneously. In this system, we capture the effects of termination agreements as a binary variable (which equals one in the presence of a lockup or a breakup fee). In the second step, we perform single-equation regressions of the toehold size. Here, we capture the effect of expected termination agreements using our model for the implied toehold.

3.2.1 Sample of lockups and breakup fees

Table 3 lists key sample characteristics for lockups and breakup fees. The source of this information is SDC. Our sample of 1,191 lockups in the target and 2,714 target breakup fees is larger than that of Burch (2001) who studies 158 lockups, and Officer (2003) and Bates and Lemmon (2003), who examines 1,052 and 1,123 target breakup fees, respectively. In addition to target breakup fees, there are bidder breakup fee agreements covering 793 our sample firms. In nearly all of these cases (714 of 793), there was also a target termination fee associated with the same transaction. As pointed out earlier, we ignore bidder breakup fees as our focus is on the *bidder's* opportunity cost (i.e. the loss of a payment from the target to the bidder) of the toehold decision.

From Panel A of Table Table 3, breakup fees average $35 mill. or 6% of the target market value of equity. The cross-sectional variation in fees is much smaller in the period 1995–2003 than in the earlier period, indicating that these types of contracts have been standardized. Bidder lockup agreements average 19% of the target shares. The lockup is set slightly below 20% to avoid the requirement of most major stock exchanges of a shareholder vote on new stock issues of 20% or more of total equity. The strike price of the lockup option average 88% of the initial offer price in the period after 1994.

Figure 4 plots the annual distribution over the period 1/1980–6/2003 of the percentage of the initial control bids in our sample where the bidder has a toehold or a termination agreement (lockup or target breakup fee). Whether the initial control bid is a merger (Part A) or a tender offer (Part B), there is a striking decrease in the toehold frequency coinciding with increased use of termination agreements. As described by Coates and Subramanian (2000), termination agreements received a boost with two judicial decisions in the Delaware Supreme Court, *Paramount* in 1994 and *Brazen* in 1997.[17] These decisions established that the typical breakup fee (as a percentage of the target's

[17] Paramount Communications, Inc. v. QVC Network, Inc., Del. Sup., 637 A.2d 34 (1994), and Brazen v. Bell Atlantic, Del. Sup. 695 A2.d 43 (1997).

assets) represents a reasonable compensation for the bidder's opportunity cost of losing the contest.

According to the Delaware Supreme Court, if the board of directors' defensive response is not draconian (preclusive or coercive) and is within a range of reasonableness, a court must not substitute its judgment for the boards.[18] In early 2000, Pfizer broke up merger negotiations between Warner Lambert (target) and American Home Product (AHP). This resulted in a breakup fee payable by Pfizer to AHP of $1.8 billion. Pfizer filed a motion in Delaware Chancery Court arguing that this represented a "draconian" defense measure under the Court's (Unitrin) standard. Pfizer eventually agreed to pay the fee on top of the $90 billion deal value. The Pfizer incident clearly establishes that the courts will protect a breakup fee that is large in dollar terms as long as it is "reasonable" in terms of percent of the deal value (2.1% in the case of Pfizer). One measure of "reasonable" appears to be a typical investment banking fee in deal transactions.

By the year 2000, as many as sixty percent of the deals had termination agreements. At the same time, toehold-bidding had declined to less than five percent. We now turn to this toehold decision, starting with a system analysis and culminating with an examination of the effect of the implied toehold.

3.2.2 A choice system for the toehold decision

Table 4 reports the results of the simultaneous estimation of (1) the probability of toehold-bidding, (2) the probability of a target breakup fee, and (3) the offer premium. To maximize the number of cases, we use three alternative definitions of the offer premium. The first two, $OP1$ and $OP2$ are the initial and final offer premiums from SDC divided by the target stock price on day -61 relative to the initial offer day.[19] In single-bid contests, $OP1$ and $OP2$ average 46% for merger offers and 57% for tender offers. As observed by Betton and Eckbo (2000) as well, in multiple-bid contests, the initial offer premium starts out lower (high 30s) and ends up higher (high 60s). $OP3$ is the offer premium computed using the target stock price on day +1 relative to the price on day -61, which allows the largest sample size (7,630) in the estimation.

There are several significant results, some of which generalize results reported earlier by Betton and Eckbo (2000), Officer (2003) and Bates and Lemmon (2003) to our larger sample and system

[18] Unitrin, Inc. v. American Gen. Corp, 651 A.2d 1361 (1995).

[19] Stock prices, target market values, and turnover data are from CRSP, while the remaining variables are from the SDC data base. The target is traded at NYSE or AMEX if it is indicated in either SDC or CRSP.

estimation. First, all three key decision variables—toehold, offer premium and breakup fee—receive statistically significant coefficients in almost all the regressions. For toeholds, the key distinction is between firms with zero or positive toeholds, while the toehold-size variable is not significant. As predicted by the toehold-resistance hypothesis, and confirming the impression left by Figure 4, toehold-bidding significantly reduces the probability of a breakup agreement.[20]

Furthermore, as first discovered by Betton and Eckbo (2000), toehold bidding reduces the offer premium. This toehold-premium tradeoff is consistent with the theory that toeholds deter competition from rival bidders (and thus lowers the winning premium), and therefore supports our toehold-resistance hypothesis. It is also interesting that termination agreements are associated with greater offer premiums. This effect is also reported by Officer (2003), who use the positive premium effect to reject the hypothesis that breakup fees harm target shareholders. This is consistent with our toehold-resistance hypothesis, under which a termination agreement is a positive inducement to friendly (and possibly efficient) negotiations.

A number of other variables also receive significant coefficients. Target hostility increases the probability of toehold-bidding, possibly because the bidder anticipates hostility and prefers to bid aggressively. A basic premise of the toehold-resistance theory is that a hostile target will not agree to a termination fee. This is borne out by the data as target hostility significantly reduces the probability of observing a target breakup fee. As reported by a number of earlier studies, target hostility also increases average offer premiums. Notice also that the presence of a poison pill does not add explanatory power in any of the regressions. The neutral effect of poison pills on offer premiums is consistent with the finding reported by Comment and Schwert (1995).

The choice of cash as payment method increases the probability of toehold-bidding, reduces the probability of target breakup fee, and increases average offer premiums. This payment method effect is in addition to a tender offer effect (cash is used more frequently in tender offers than in mergers) since the regressions also include a tender offer variable.[21] Toehold-bidding is more likely in tender offers and in tender-mergers than in mergers. Moreover, toehold-bidding is more likely

[20] Officer (2003) and Bates and Lemmon (2003) also find that the probability of a termination agreement is inversely related to toehold-bidding.

[21] A strongly positive premium effect of cash was first reported by Travlos (1987) and Huang and Walkling (1987) for bidder returns and by Eckbo and Langohr (1989) for target returns. The latter study also finds a premium effect of cash in minority buyouts. In the theoretical bidding literature, cash signals bidder quality because cash carries a greater expected overpayment cost than does stock. See, e.g., Hansen (1987), Fishman (1989), and Eckbo, Giammarino, and Heinkel (1990). Hirshleifer (1995) provides a review of the theory.

when the target stock is relatively liquid, as indicated by the target being listed on one of the major stock exchanges. Finally, toehold bidding is less likely—and leads to lower premiums—the greater the target equity size.

We now turn to the effect of the implied toehold on the toehold decision, in a direct and unique test of the toehold-resistance hypothesis.

3.2.3 Effects of the implied toehold

Termination agreements started to surface in the mid 1980s. Thus, we presume that bidders started to consider the tradeoff between toeholds and termination fees in 1985. For each of 6,928 initial bids over the period 1985-2003, we estimate the bid's implied alpha, $\hat{\alpha}$, computed using Eq. (7) and Eq. (8) above. The computation requires an estimate of the the bidder's valuation v of the target, of the probability θ that the target remains independent, and of the termination fee t. Normalizing using the target value on day -61 relative to the initial offer day, we estimate v from the offer premium (truncated at 4 and scaled from 0 to 1). For robustness, we use all three offer premiums $OP1$, $OP2$, and $OP3$.

The probability θ is estimated using a probit regression across 12,189 contests. The explanatory variables include indicators for cash payment, target hostility, poison pill, tender offer, tender-merger, target traded on NYSE or AMEX, announcement year 1984-1994, 1995-1996, and 1997-2003, and a constant.[22] The termination fee t is either set equal to the observed t or, when a termination fee is not observed, estimated as the average t across all control contests in the same calendar year.[23]

The results are reported in Table 5. The table shows two sets of regressions: logit estimations of the probability of toehold-bidding, and OLS estimation of the toehold size. The key variable is "Implied $\alpha < 4\%$", which is a takes on a value of one if the estimated implied alpha is less than four percent. Recall that the implied alpha is the toehold size required to replace an expected bidder return equal to that of a target breakup fee. Under the toehold-resistance hypothesis, toehold-bidding results in the loss of an opportunity for a termination agreement. When this opportunity

[22] Since the theory presumes θ is exogenous to the bidder, the estimation of θ excludes the offer premium and the toehold.

[23] SDC provides information on the dollar value of the fee. t is this dollar value divided by the market value of the target's total equity. To hedge against SDC data errors, we exclude cases where t is greater than 30%.

cost (as measured by the implied alpha) is relatively low, then the probability of toehold-bidding should be high.

We use an implied toehold size of 4% as a threshold value in the regression to reflect the potentially significantly negative bidder impact of having to disclose a toehold acquisition of 5% or greater. The implied toehold receives a significantly positive coefficient in all six regressions, as predicted. Since the regressions also include a separate binary variable for the actual presence of a termination fee (which significantly reduces toehold bidding), this is strong evidence in favor of the toehold-resistance hypothesis. That is, not only does the actual presence of a termination fee reduce the likelihood and magnitude of toehold bidding: toehold bidding becomes more likely when the toehold required to replace the expected profits of a breakup fee is small.[24]

4 Toehold cost when target eliminates all bids

Some targets may resist *all* bidders, independent of their toeholds. If target resistance eliminates all bidders, the target stock price may fall as a result. The fall may simply reflect a reversal of an earlier anticipated premium effect in the target stock price. In addition, as modelled by Goldman and Qian (2004), the no-bidder-wins outcome may signal managerial entrenchment, causing a further price drop. Under our bidder-elimination hypothesis, the prospect of negative target returns in the no-bidder-win outcome deters toehold bidding. For this hypothesis to be true, it must be that (i) total contest-induced target returns are negative in the no-bidder-wins state, and (ii) the target

[24] As a robustness check, we re-estimated the equations in Table 5 using a value for the implied α estimated assuming that bidder private values v are distributed normal (as opposed to uniform in Proposition 1). With normality, $\hat{\alpha}$ is estimated as

$$\alpha = (p - v)\frac{g(p)}{1 - G(p)}$$

where p minimizes the mean square error of $\Pi_{toe} - \Pi_{break}$ and

$$\Pi_{toe} = (1-\theta)(vG(p) - (1-\alpha)\int_0^p p_2 g(p_2)dp_2 + \alpha p[1 - G(p)]),$$

and

$$\Pi_{break} = (1-\theta)(\int_0^{v(1-t)} (v - p_2)g(p_2)dp_2 + tv[1 - G(v(1-t))]) + \theta tv.$$

The mean μ and standard deviation σ are used to compute the density and distribution functions g(v) and G(v) from the normal distribution. This estimation, which was performed using a sample of 6,787 control contests 1985-2003, yields results that are indistinguishable from those reported in Table 5. Thus, the results for the implied alpha are robust to the (uniform) distributional assumption underlying Table 5.

returns under (i) are more negative the greater the toehold.[25] We examine part (i) of this prediction in Section 4.1, and part (ii) in Section 4.2.

4.1 Abnormal returns when no-bidder-wins

Recall from Table 1 that 2,933 contests initiated by merger bids (32% of the total sample of 9,238 initial merger bids) end up in the no-bidder-wins outcome. This percentage is greater than the target failure rate in contests initiated by tender offers (23%), and it indicates that merger negotiations are riskier than anticipated in the extant literature (see e.g. Betton, Eckbo, and Thorburn (2005)). In the 2,933 contests, 47% of the initial bidders are publicly traded companies, while 36% are privately held firms. In contrast, in the 6,278 merger contests where a bidder ends up winning the target, 74% of the initial bidders are public while only 17% are private. Conversely, of the 2,117 merger contests initiated by a private bidder, 49% result in the no-bidder-wins state, while the corresponding percentage for public bidders is 23%. Thus, it appears that the status of a bidder as "private" increases the risk of failed merger negotiations.

Four percent of the failed private bidders offered all-stock as payment method. Thus, the overall failure rate is not driven by the difficulty of a "going private" decision by the target. It is, however, possible that managers of publicly traded bidder firms have more to lose (in terms of managerial reputation) from failed merger talks. If so, they are less willing to walk away from the negotiations once they are committed to the process. While not pursued further here, this suggests a possible explanation for why successful, publicly traded bidder firms on average realize lower merger gains than do private bidders (Bradley and Sundaram (2005)). Incidently, in our sample, the frequency of target termination agreements in merger negotiations is substantially greater for public than for private bidders (46% versus 14% in the period 1986-2003), which further supports this reputational risk argument.

Target and bidder wealth effects of the no-bidder-wins outcome are estimated as the total abnormal return from day -61 relative to the first bid through the contest ending date. The ending date is taken to be the earlier of the target delisting date and the day of the last bid in the contest + 125. We are particularly interested in the abnormal return given that the target is unsuccessful

[25]The prediction of our bidder-elimination hypothesis is stronger than that of Goldman and Qian (2004), whose model implies part (ii) but not necessarily part (i).

(no bidder wins). If this return is negative, then a toehold bidder will realize a negative return on the toehold investment.

The results are reported in Table 6. Since the number of days between event nodes in the tree vary across contests, we use the flexible "variable-window" procedure first used by Eckbo and Langohr (1989) to estimate total contest-induced abnormal stock returns. Thus, the average cumulative abnormal return reported in the table is

$$\Gamma_{end}^{-61} = \frac{1}{N}\sum_{j=1}^{N}\Gamma_{j,end}, \tag{9}$$

where $\Gamma_{j,end} = \sum_{k=1}^{K}\omega_k\gamma_k$, and where ω_k is the number of trading days in window k. The windows run from day -61 through the ending date of the control contest and where day 0 is the announcement date of the initial control bid. The parameter γ_k is estimated using the following market model:

$$r_{jt} = \alpha_j + \beta_j r_{mt} + \sum_{k=1}^{K}\gamma_{j,k}d_{kt} + \epsilon_{jt}, \tag{10}$$

where r_{jt} is the return to firm j and r_{mt} is the market return. Here, d_{jt} is a dummy variable that takes a value of 1 in the specific event window within the period $[-61, end]$ and zero otherwise.

To be included in the sample, we first identify the IPERM number for the firm and require that there be at least 100 days of trading (volume greater than zero) during the period (-251,-62), and at least 2 days of returns in the period (-1,1). The estimation uses ordinary least squares with White's heteroscedastic-consistent covariance matrix, and the estimation period starts 251 days prior to the announcement of the initial bid and ends at the minimum of the target delisting date or 125 days after announcement of the last bid. The z-statistic reported in the table is

$$z = \frac{1}{\sqrt{N}}\sum_{j=1}^{N}\frac{\Gamma_j^{-61}}{\sigma_{\gamma_j}}, \tag{11}$$

where σ_{γ_j} is the estimated standard error of $\Gamma_j^{-61} \equiv \omega_j\gamma_j$. For large sample size N, the z-statistic has a standard normal distribution under the null hypothesis of zero average cumulative abnormal return.

Table 6 reports estimates for initial merger bids and initial tender offers separately. For target firms, the average abnormal returns for the entire contest is significantly positive when either the initial bidder or the rival bidder wins, while it is significantly negative when no bidder wins. The average target abnormal returns are 25.6%, 16.7% and -9.6% for these three outcomes, respectively. The median values are close to the mean for the first two outcomes, however, for the no-bidder-wins outcome the median is much smaller, -1.7%. These results are interesting for two reasons. First, to our knowledge, we are the first to report significantly negative target abnormal returns in the no-bidder-wins state. This also means that a toehold bidder for these targets realize a loss on the toehold. Second, the average target gains in initial merger bids are greater when the initial bidder wins than when a subsequent rival bidder wins the contest. Thus, competition appears to reduce rather than increase the (unconditional) average target gains in contests initiated by a merger bid.

The results are very different when the contest is initiated by a tender offer. First, average abnormal target returns in the no-bidder-wins state are now significantly positive (2.4%, median 9.9%). Thus, a toehold bidder realizes a toehold gain also in this state. Second, target gains are greater in all states relative to contests initiated by a merger bid, e.g. 42.1% versus 25.6% when the initial bidder wins. Third, the average return to targets is about the same whether the initial or rival bidder wins (42.1% versus 41.1%).

Turning to bidder firms, total contest-induced abnormal returns are negative and significant for all three outcomes when the initial bid is a merger offer. Winning the contest after a merger bid implies a negative average abnormal bidder return of -5.1%. Curiously, bidder losses are greater when the rival bidder wins (-16.1%), and greater again if no bidder wins (-18.1%). The median values here yield similar inferences. For contests initiated by a tender offer, the average abnormal return to the initial bidder is -4.1% if it wins (statistically significant with a z-value of -2.16), -6.9% if it loses to a rival (not statistically significant with a z-value of -0.47), and -12.0% if no bidder wins (again statistically significant with a z-value of -2.07).

The key issue is whether toehold bidding is costly. To answer this question, it is necessary to condition the abnormal return estimates on the presence of a toehold and other of the bidder's choice variables (such as the premium, payment method, etc.). Betton and Eckbo (2000) report that toehold bidding increases the probability of bidder success. If so, toehold bidding may be beneficial to the bidder despite the evidence of negative average abnormal target return in the unsuccessful state shown in Table 6. If the bidder is better off winning than losing the contest (as indicated by Table 6), the net effect of toehold bidding may be positive because a toehold increases the chance of the initial bidder winning the contest. That is, while reducing the toehold reduces the bidder's exposure to the negative target return in the no-bidder-wins state, increasing the toehold may increase the exposure to the positive and larger target returns when some bidder wins. The net effect depends on the marginal impact of toehold bidding on the probabilities of the two outcomes. We examine this issue next.

4.2 Marginal effect of toehold bidding

Betton and Eckbo (2000) propose a technique for structurally estimating the contest event tree in such a way that the cross-sectional variation in the bidders' choice of offer parameters is fully accounted for. We begin by estimating the probability of the target unsuccessful outcome in the contest tree using the following logit function:

$$F(X_j'\beta) = \frac{1}{1 + \exp(-X_j'\beta)}, \tag{12}$$

where $X - j$ is a vector of offer characteristics. The characteristics and estimated parameters β are reported in Table 7. The explanatory variables include *Toehold* (the percent of the target shares held by the initial bidder at the time of the initial control bid); the dummy variables *Target hostility*, *Cash only payment*, and *Tender offer*; *Exchange* (equals 1 if the target is listed on NYSE or AMEX); two sample period dummies, one for the period 1984-1994 and another for the period after 1994; *Term. agreement*, a dummy for the presence of a termination agreement (using SDC information); *Pill*, a dummy when the offer is associated with a poison pill (SDC information); and *Premium*, the offer price divided by the stock price 61 days before the offer date adjusted for splits and dividends.

Table 7 shows that the probability of the target unsuccessful outcome decreases in the bidder's toehold when using either Model I or III (which exclude the offer premium in order to increase the sample size from 4,974 to 8,000). As expected, target hostility significantly increases the risk of target remaining independent, as do cash-only as payment method and the target being listed on a major exchange. Interestingly, the probability of no bidder winning is significantly *lower* if the contest starts with a tender offer rather than with a merger bid. This indicates that starting the contest with a friendly merger offer entails extra failure risks for the initial bidder.

Given the estimated probability of the target-unsuccessful outcome, the conditional expected return are estimated as parameters μ in the following cross-sectional regression equation:

$$\Gamma_j = \mu_{ts} + \mu_{tu} F(X_j' \beta) + \epsilon, \tag{13}$$

where the regressor $F(X'\beta)$ is the estimate in Table 7 and the dependent variable Γ_j is estimated as in Table 6. The constant term, μ_{ts}, is the expected abnormal return in the "target successful" outcome, which combines the "initial bidder wins" and the "rival bidder wins" outcomes in Figure 1. The slope coefficient, μ_{tu}, measures the expected return in the target-unsuccessful state conditional on the vector X of the bid characteristics shown in Table 7.

The results are shown in Table 8 for target abnormal returns, and in Table 9 for bidder abnormal returns. The results are fairly similar across Model I through Model III (which refer to the models for the probability estimation in Table 7) so we focus on Model I results. Interestingly, the expected target abnormal return in the target-unsuccessful outcome (μ_{tu}) is negative and significant for all three abnormal return cumulation periods across the three panels of Table 8. However, all three panels also show that the mean predicted target abnormal return in the target-unsuccessful state is positive. This is the mean of the predicted Γ's when the target unsuccessful state actually occurs (i.e., predict the Γ for a given firm and then average these predictions for all targets that were actually unsuccessful).

Note that the "Observed mean Γ in tu-state" is negative in Panel C. of Table 8. This is the mean of the actual Γ's when the target unsuccessful state actually occurs. The reason why the "Mean predicted Γ in tu-state" is positive when the "Observed mean Γ in tu-state" is negative is that only the former takes into account the effect of the offer characteristics (such as the toehold) on the ex ante probability of the target-unsuccessful outcome. The "Observed mean" essentially assumes that this probability is equal to one, which is obviously false.

Turning to the bidder abnormal return estimates in Table 9, the estimates of μ_{tu} is negative but insignificant when we cumulate abnormal returns over either the "runup" and initial offer period [-61 through +1] or the "markup" period [-1 through end of contest]. For the three-day initial offer period [-1 through +1] the expected bidder abnormal return in the target-unsuccessful state is *positive*: μ_{tu}= 2.6% with a t-value of 4.08.

The final step in the structural analysis is to compute the average change in the predicted abnormal returns from a change in the toehold. The change in the predicted abnormal returns is computed as

$$\frac{d\Gamma}{dX} = (\frac{\partial F(X'\beta)}{\partial X})(\frac{\partial \Gamma}{\partial F(X'\beta)}) = p(X)(1 - p(X))\beta\mu, \tag{14}$$

where dX is the change in the bidder's toehold, and $p(X)$ is the partial derivative (density) of $F(X'\beta)$. The marginal effect $d\Gamma/dX$ is estimated for each initial bid and then averaged across the sample. The results are shown in Table 10. Again focusing on Model I and the two longer windows of cumulation, the marginal impact of increasing the bidder's toehold—taking into account the effect of the toehold on the outcome probabilities—is positive. Thus, we reject the hypothesis that the negative target abnormal returns in the target-unsuccessful state deters toehold bidding.

5 Toeholds and markup pricing

With a sample of 1,814 takeover bids (1975–1991), Schwert (1996) concludes that the greater the runup in the target's share price prior to a takeover bid, the greater the total premium paid for the target. Thus, a target runup appears to increase the final cost of the takeover.[26] If toehold purchases cause runups and a therefore a premium penalty, bidders may be understandably reluctant to acquire large toeholds. We follow Schwert (1996) and examine whether there is evidence of "markup pricing" in our sample of control bids. We then examine whether the marginal impact of toehold-bidding on the bidder markup is negative.

The cross-sectional markup regression is of the following form:

$$Markup_i = a + bRunup_i + cX + \epsilon_i, \tag{15}$$

where $Markup$ is Γ_{end}^{-1} and $Runup$ is Γ_{-2}^{-61}.[27] The control variables contained in the vector X are all binary: $Tender$ = 1 if the initial offer is a tender offer; Toe = 1 if the percent of the target held by the initial bidder at the start of the contest is greater than zero; $Compete$ = 1 if the number of

[26] Schwert (1996), concludes that "at least two-thirds of the runup is added to the total premium paid by successful bidders" (p.188).

[27] Recall that the total contest-induced abnormal stock return, i.e. the sum of the regression variables $Runup$ and $Markup$, are shown in Table 6.

bids is greater than 1; *Exchange* = 1 if target listed on NYSE or AMEX; and *Paymix* = 1 if the method of payment was not all-cash.

Schwert (1996) considers two competing hypotheses. Under the markup pricing hypothesis, the runup raises the total premium so that the predicted value of coefficient b in Eq. (15) equals zero. Under the substitution hypothesis, the runup does not affect the total premium paid, i.e., the runup is simply a manifestation of market anticipation of the pending bid. In this case, the predicted value of coefficient b is negative. The third possibility is $b > 0$. This follows if some underlying factor—omitted from the vector of controls X—has a positive impact on both the runup and the markup, possibly "turbo-charging" a markup effect.

The results of estimating Eq. (15) is presented in Table 11 for targets (Panel A) and bidders (Panel B). In all of these regressions, *Runup* is positive and strongly significant with coefficient values ranging from 0.39 (first target regression) to 0.53 (last bidder regression), and with t-values ranging from 7 to 14. In all regressions, inclusion of control variables increases the estimated coefficient on *Runup*. In sum, there is a reliably positive association between *Runup* and $Markup$ for both bidders and targets.

Turning to the marginal impact of the control variables, $Toehold$ receives a positive and significant coefficient in all four regressions where it appears. That is, toeholds increase average markups for both bidders and targets. Since the bidder markup is a *gain*, the positive impact of toehold again indicates that toehold bidding is beneficial to the bidder. The results also show that toeholds reduce the target runup but have no significant impact on the bidder runup. If a greater target runup means greater bidder takeover cost, this is further evidence that toehold bidding is beneficial for the bidder.

As expected, bidder gains (markup) is lower when the initial bid attracts competition from rival bidders: the coefficient on $Compete$ is negative and significant in Panel B. Note also that $Compete$ is not significant in the target regression, nor does $Compete$ interact with *Runup* for either targets or bidders. Also, the coefficient on $Tender$ is positive and significant in all four regressions, indicating that auctions generate greater target markups but also greater bidder gains. The tender offer dummy interacts negatively with *Runup* in all regressions. The variable *Exchange* receives a negative and significant coefficient for targets, and a positive and significant coefficient for bidders. Thus, bidder markups are greater and target markups lower when the target is listed on either

NYSE of AMEX. *Paymix* is significant and positive for targets and negative but insignificant for bidders, indicating greater target markups when the initial offer involves payment in bidder shares or mixed cash/stock.

In Table 12, the markup regressions are run on the subsample of 4,286 contests where both the bidder and target are exchange-listed. Here, we include the *target* runup as an explanatory variable for the *bidder* markup (regressions two and three) and the *bidder* total contest return (regression four). Interestingly, the target runup has a positive and strongly significant impact on bidder returns. In particular, the coefficient on *Target Runup* in the last regression, where the dependent variable is total contest abnormal return to bidders, is 0.39 with a t-value of 8.28. In this regression there is no separate impact of toehold-bidding (either as a stand-alone variable or interacting with target runup).

The positive impact of the target runup on bidder returns fails to support the notion that the target runup represents a direct cost to the bidder. This inference follows regardless of the toehold strategy of the bidder. There is also no evidence of a separate and negative toehold effect on bidder expected returns. Thus, it appears that markup pricing—while strongly present in Table 11—also cannot explain the absence of short-term toehold bidding.

6 Conclusions

Since corporate takeovers require large offer premiums, the case for purchasing a toehold prior to making the offer is both intuitive and compelling. If the toehold acquisition does not alert the market to the pending bid, the expected return on the toehold investment is of the same order of magnitude as the takeover premium itself. Thus, even small toeholds may yield substantial cost savings for the bidder.[28] Toehold gains are sustained even if the bidder loses the contest to a rival, who then acquires the toehold at a premium. There is a downside to holding a toehold only if all bidders fail *and* the market reduces the target share price to a level below the toehold-purchase price. Standard auction theory also implies that toehold-bidders have a competitive advantage over rival bidders with lower toeholds. The expected toehold profit raises the bidder's willingness to

[28]For example, if Pfizer had purchased a toehold of only one percent one month prior to announcing its ninety-billion offer for Warner-Lambert in January of 2001, Pfizer would have saved about $250 million in transaction value. This despite the fact that Warner-Lambert's stock price had already experienced a substantial runup from its initial merger negotiations with American Home product.

pay, making it a more aggressive competitor.

Yet, we show that toehold bidding is rare (11% of more than twelve thousand contests), and that acquisition of short-term toeholds is almost non-existent (2%). Conversely, when toeholds are acquired, less than 5% (of a sample exceeding ten thousand) lead to a follow-on control-bid. The message from the data is clear: Toehold acquisitions represent almost exclusively long-term investments and only rarely occur in connection with takeover bids. The degree of aversion to toehold bidding is a major puzzle in corporate finance.

We address this puzzle by attempting to identify economically plausible toehold costs. We focus on three potential sources of costs, of which the first two originate in target resistance to one or more bidders. First, under the *toehold-resistance hypothesis*, we argue that approaching the target with a toehold may reduce the target's willingness to negotiate. The formal proof is in the paper, and the intuition is as follows: If the bidder abandons negotiations and launches a hostile tender offer, the toehold raises the probability of the bidder winning the hostile auction. Thus, approaching the target with a toehold signals "let's negotiate...or else" to the target management. This gives precise economic content to the notion among practitioners that toehold bidding is "aggressive".

The immediate empirical implication of the toehold-resistance hypothesis is that the frequency of zero-toehold bidding should be greater in ex post friendly than in hostile takeovers, and greater in contests initiated by merger negotiations than by a tender offer. Moreover, zero-toehold bidding should increase with increasing costs of target defensive actions, such as with the emergence of the poison pill. Also, when toehold bidding does occur, it should both increase the probability of initial bidder success and lower final offer premiums. The empirical evidence supports all of these predictions.

The emergence of standardized termination agreements (lockups and breakup fees) in the 1990s offers a further opportunity to test our toehold-resistance hypothesis. Much like toeholds, lockups and breakup fees represent rewards to unsuccessful bidders. However, for the bidder to receive a termination agreement, the target must be friendly. Thus, a specific cost to the acquiror of triggering hostility (because of the toehold) is the foregone value of the termination agreement. Our bidding model allows computation of the toehold threshold that implies equal expected profits to that of a breakup fee or lockup. Using the sample average probability of the no-bidder-wins outcome, the implied toehold is eight percent for a typical breakup fee and twelve percent for a typical lockup option. These implied toehold levels increase further if we add other types of resistance costs, such as the expected dilution from a poison pill. As predicted, we find that the probability of toehold-bidding is significantly greater when the implied toehold is relatively small.

Our second potential source of toehold costs is summarized in the *bidder-elimination hypothesis*. Here, the target resists *all* bidders, independent of toeholds, possibly generating negative return on the short-term toehold investment. We examine this issue empirically using the structural estimation technique developed in Betton and Eckbo (2000). This technique extracts the expected return to the "no-bidder-wins" outcome from offer-induced target abnormal stock return across the total sample of bids. We find that the unconditional, average total contest-return to targets is significantly negative when all bids fail. However, the marginal impact of a toehold is to increase the probability of the target being successful to the point the total (conditional) impact on bidder returns of increasing the toehold is positive. Thus, the bidder-elimination hypothesis is unlikely to explain the toehold puzzle.

Our third toehold cost hypothesis is inspired by the markup pricing argument of Schwert (1996). Markup pricing occurs when the bidder views the pre-bid target runup as evidence that the target stand-alone value has increased, causing the bidder to raise the offer price accordingly. The bidder could alternatively regard the target runup as a manifestation of the expected merger premium, and keep the offer price unchanged. With imperfect information, a rational bidder places some weight on either of the two interpretations and raises the offer price to some degree. To the extent that toehold acquisitions result in a target stock price runup, toehold bidding may increase the cost of the takeover. As Schwert (1996), we report substantial evidence of markup pricing across mergers and tender offers. However, we also show that the total bidder abnormal return is increasing both in the target runup and in the toehold. Thus, we reject the hypothesis that toehold bidding raises takeover costs through target runup effects.

Overall, the most plausible interpretation of our evidence is that resistance costs—here quantified as the opportunity cost of termination agreements—represent the primary source of short-term toehold costs for most bidders. Termination agreements appear to dominate short-term toehold purchases for bidders attempting to initiate merger negotiations.

A A generalized zero-toehold bidding proposition

As shown in the text (Proposition 1), toeholds imply overbidding which increases the chance that the toehold bidder wins the hostile shadow auction (in the event that friendly merger negotiations turn hostile). For this reason, toeholds may be viewed as "aggressive" by the target and may induce target resistance. In the text, we used the opportunity cost of a termination agreement as an example of resistance cost. More generally, suppose target resistance inflicts the cost $r \in [0, 1]$ on the initial bidder, reducing the bidder's valuation of the target from v to $v - r \geq 0$. As before, the bidder trades off expected toehold benefits with resistance costs. Moreover, assume that target management owns stock in the target, and that they enjoy private benefits of control. Overbidding by the toehold bidder increases the value of the target management stockholding, while the private benefits of control are lost if the hostile bidder wins and management is fired. Thus, the target management trades off the share-value gain with the private-benefit loss in its decision to resist a bidder with a toehold. Proposition 3 holds that zero-toehold bidding followed by no-resistance may be incentive-compatible for both parties:

> **Proposition 3 (Zero-toehold bidding):** *Suppose the target management owns a fraction $\tau \in [0, .5]$ of the outstanding target shares, and that it derives private (non-contractible) benefits of control of $\beta \in [0, 1]$. There exists a zero-toehold equilibrium bidding strategy where (1) the expected cost of target resistance exceeds the expected toehold benefit for the initial bidder, and (2) target management agrees to negotiate only if the bidder approaches with a zero toehold.*

Proof: The proof proceeds in three steps: (1) Derive the hostile bidder's optimal bid p^* given α and r. (2) Solve for the target's optimal resistance strategy given τ, β, and the bidder's toehold and optimal bid. (3) Show that zero-toehold bidding is optimal given target management's optimal resistance strategy. As in the text, bidder private valuations are i.i.d with distribution and density functions $G(v)$ and $g(v)$, where we use the uniform distribution ($v \sim U[0, 1]$) for tractability. The toehold bidder's expected profit Π in the hostile auction is

$$\Pi = (v - r)G(p) - (1 - \alpha) \int_0^p p_2 g(p_2) dp_2 + \alpha p[1 - G(p)] = (v - r + \alpha)p - \frac{1}{2}(1 + \alpha)p^2, \quad (16)$$

where p_2 is the price offered by rival bidder (who is friendly to the target) and the last equality imposes the uniform distribution. The three terms after the first equality are the bidder's expected value conditional on winning, the expected payment for the target conditional on winning, and the expected value from selling the toehold α to the rival bidder when the rival wins the auction. From the first-order condition,[29] the optimal bid p^* is

$$p^* = v - r + \alpha \frac{1 - G(p^*)}{g(p^*)} = \frac{v - r + \alpha}{1 + \alpha}. \tag{17}$$

Target management's optimal resistance strategy is chosen so as to maximize its expected utility $U = E(\beta) + \tau E(p)$, where p is the price paid by the winning bidder in the auction. Let U^* denote the expected utility conditional on the optimal bid price p^*. U^* is the sum of the expected utility given that the hostile bidder wins the auction and the expected utility given that the rival (and friendly) bidder wins:

$$U^* = \tau \int_0^{p^*} p_2 g(p_2) dp_2 + (\tau p^* + \beta)[1 - G(p^*)] = \tau p^* - \frac{\tau}{2}(p^*)^2 + \beta(1 - p^*). \tag{18}$$

If $\alpha = 0$, target management optimally resists ($r > 0$) iff $U^*_{r>0|\alpha=0} > U^*_{r=0|\alpha=0}$, or iff[30]

$$\frac{\beta}{\tau} > 1 + \frac{r}{2} - v. \tag{19}$$

If $\alpha > 0$, the target resists iff $U^*_{r>0|\alpha>0} > U^*_{r=0|\alpha>0}$, or iff[31]

$$\frac{\beta}{\tau} > 1 + \frac{r}{2(1+\alpha)} - v - \alpha. \tag{20}$$

[29] $\partial \Pi / \partial p = \alpha[1 - G(p)] + (v - r - p)g(p) = 0$.

[30] The full condition for $U^*_{r>0|\alpha=0} > U^*_{r=0|\alpha=0}$ is

$$\tau(v - r) - \frac{\tau}{2}(v - r)^2 + \beta(1 - v + r) > \tau v - \frac{\tau}{2}v^2 + \beta(1 - v).$$

[31] The full condition for $U^*_{r>0|\alpha>0} > U^*_{r=0|\alpha>0}$ is

$$\tau(\frac{v - r + \alpha}{1 + \alpha}) - \frac{\tau}{2}(\frac{v - r + \alpha}{1 + \alpha})^2 + \beta(\frac{1 - v + r}{1 + \alpha}) > \tau(\frac{v + \alpha}{1 + \alpha}) - \frac{\tau}{2}(\frac{v + \alpha}{1 + \alpha})^2 + \beta(\frac{1 - v}{1 + \alpha}).$$

In sum, the target resistance decision depends on the magnitude of $\frac{\beta}{\tau}$. For sufficiently large target private benefits β, the targets resists, regardless of α. Conversely, for sufficiently large shareholding τ, the target never resists. For intermediate values, such that

$$1 + \frac{r}{2(1+\alpha)} - v - \alpha < \beta/\tau \leq 1 + \frac{r}{2} - v, \tag{21}$$

target management resists only if $\alpha > 0$. To complete the proof, the initial bidder selects a toehold strategy that maximizes its expected profits given the target's optimal resistance strategy. The optimal toehold is positive when $\frac{\beta}{\tau}$ is such that the target either always resists or always does not resist (since the target's decision is then independent of α). When the target resists only if $\alpha > 0$, the bidder selects $\alpha = 0$ if and only if $\Pi^*_{\alpha=0,r=0} \geq \Pi^*_{\alpha>0,r>0}$, or iff

$$v > (\frac{\alpha - r}{\alpha})(1 + \sqrt{1+\alpha}). \tag{22}$$

Intuitively, the bidder selects a zero toehold whenever target resistance costs significantly reduces the value of the takeover.[32] ■

[32]Note that this condition holds for any value of v if $r > \alpha$.

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Figure 1

Structure and outcomes of the control contest event tree, and the corresponding total number of partial acquisition (toehold) and initial control bids, 1971–2003.

The event tree contains two types of bids: "Acquisition of partial interest" (the bidder seeks to own less than 50 percent of the target shares) and "Initial bid for control" (the bidder seeks to own more than 50 percent and is the first in six months to do so). A partial acquisition bid need not be followed by a control bid, and a control contest does not require a prior partial acquisition. A control contest is defined in calendar time so that there are no bids within six months of the first bid, or within six months following the last identified bid.

Starting at the far left end of the tree, "All offers" is the sum of 10,908 partial acquisition (toehold) bids occurring in Stage 1, and another 12,723 initial bids for control in Stage 2 of the tree. Of the partial acquisitions in Stage 1, 95 percent (10,359 bids) do not lead to a control contest. Moreover, of the initial control bids, only 3 percent (431 bids) follow a partial acquisition. Bids occurring after the initial control bid are not counted in the figure. Stages 3 and 4 of the tree indicate the type of the initial control bid (Tender offer/Merger) and final contest outcome (Initial bidder wins/Rival bidder wins/No bidder wins). Target management's response emerges between stages 2 and 4.

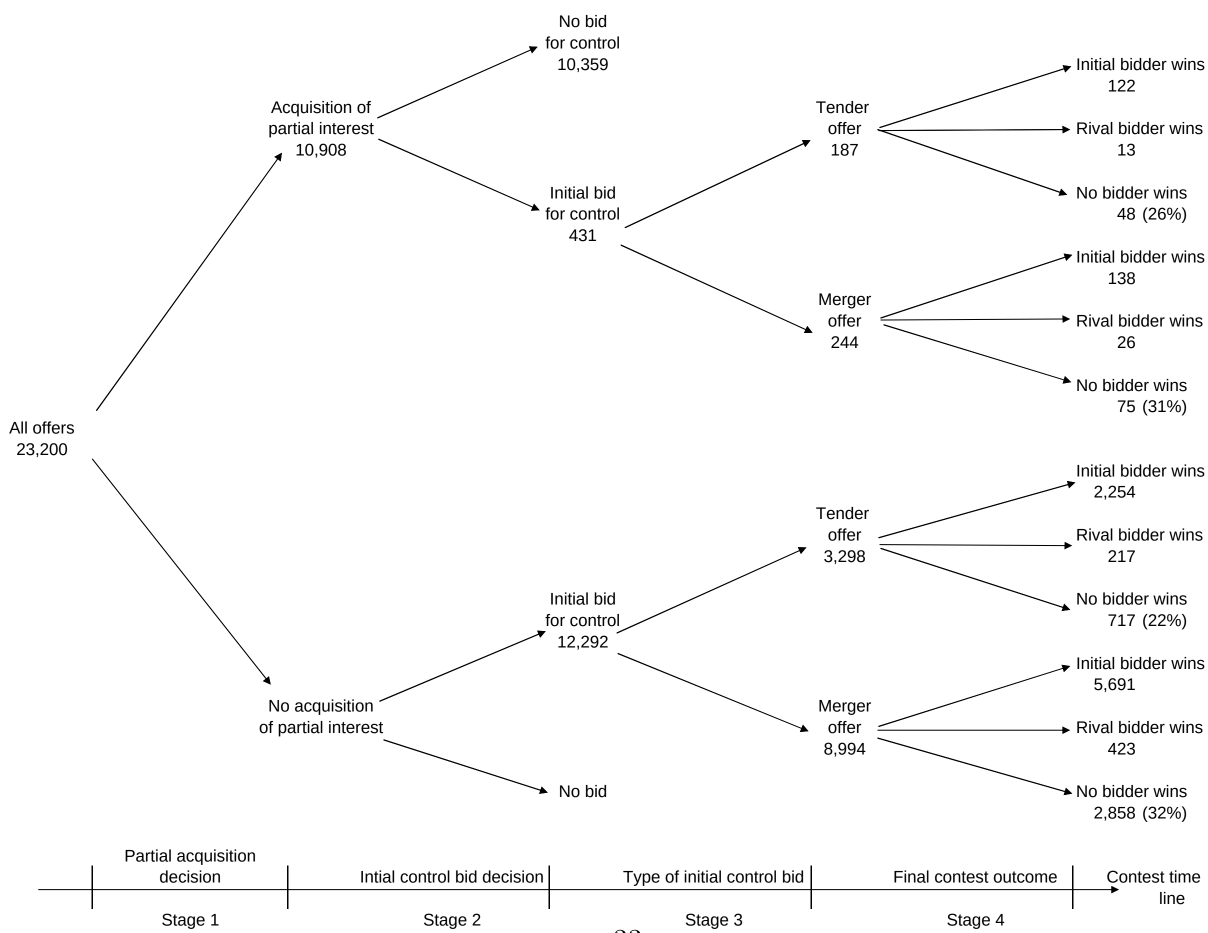
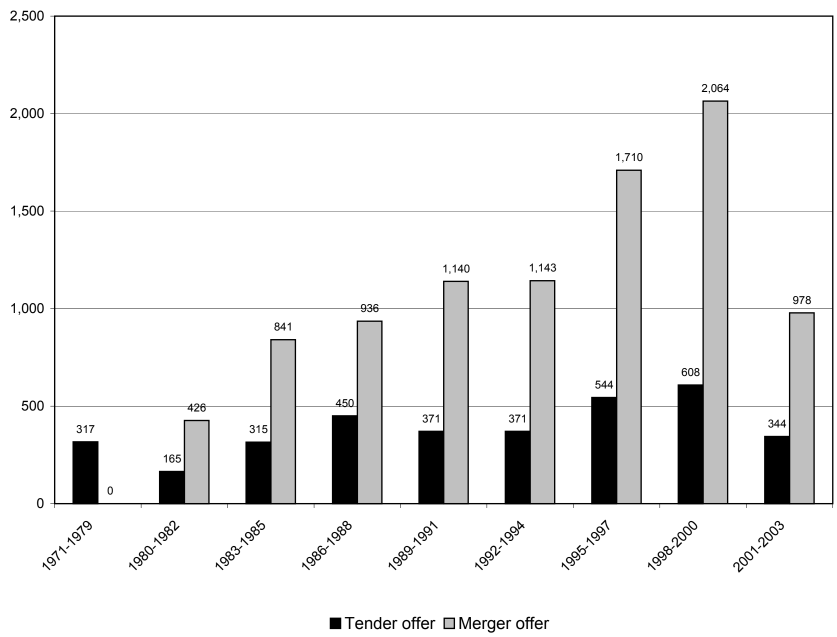


Figure 2
Annual distribution of the number and average deal value of 9,238 initial merger offers and 3,485 initial tender offers for control, 1971–2003.

(A) Distribution of the number of initial merger and tender offers for control



(B) Distribution of the average deal value ($ mill)

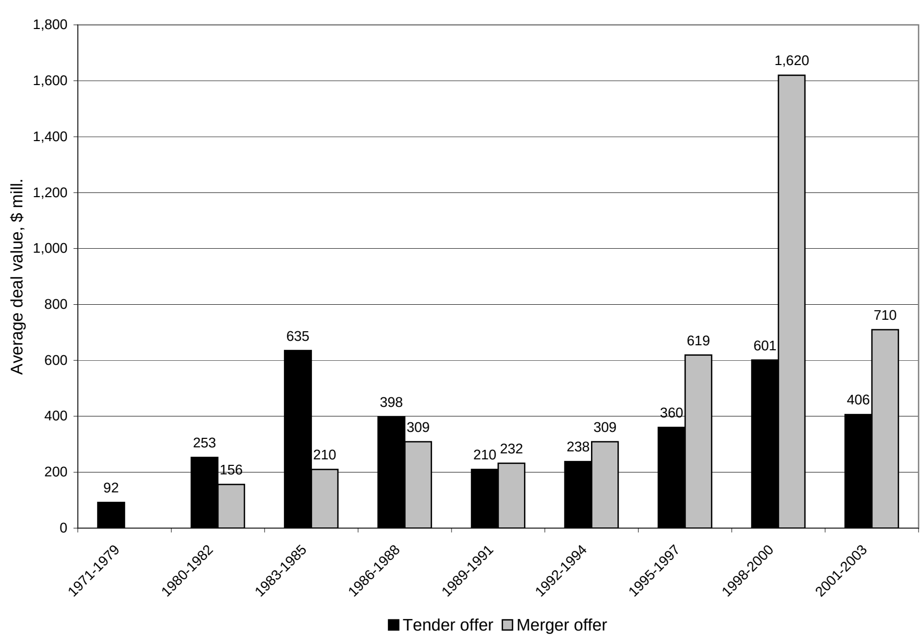
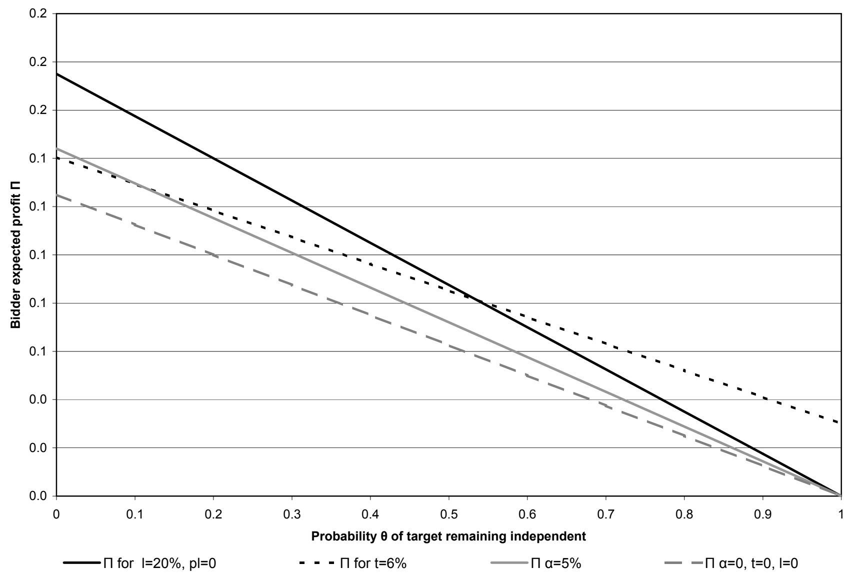


Figure 3
Expected bidder profit and implied alpha as a function of the probability θ that the target is unsuccessful (no bidder wins).

Assumptions: Bidder valuations are distributed uniform, $v \sim U[0,1]$, and the initial bidder's private valuation is $v_1 = 0.5$. The breakup fee is t=6% of the target's total asset value (v). The lockup option is for 20% of target stock at the price of $p_l = 0$. In Panel A, the bidder toehold is 5%.

(A) Expected profits of bidding with toehold, breakup fee or lockup option



(B) Implied alpha as a function of the target-unsuccessful probability θ

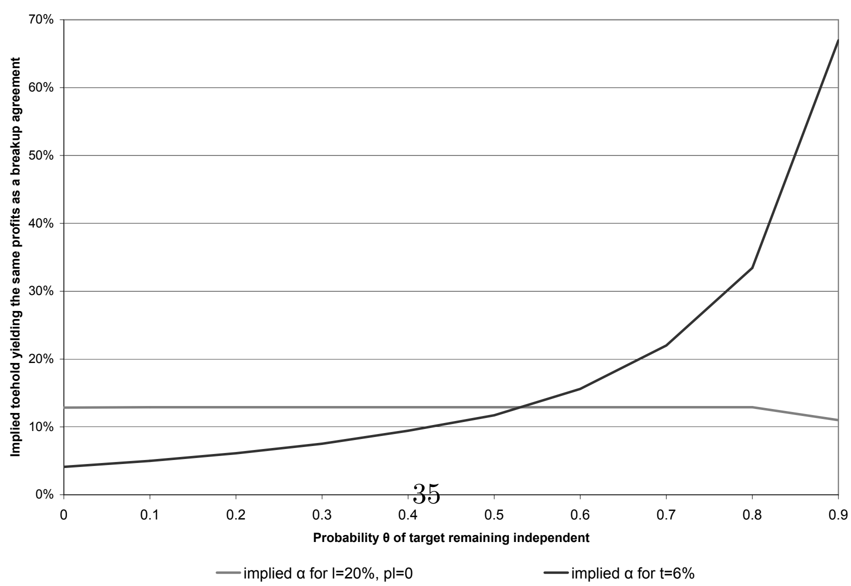
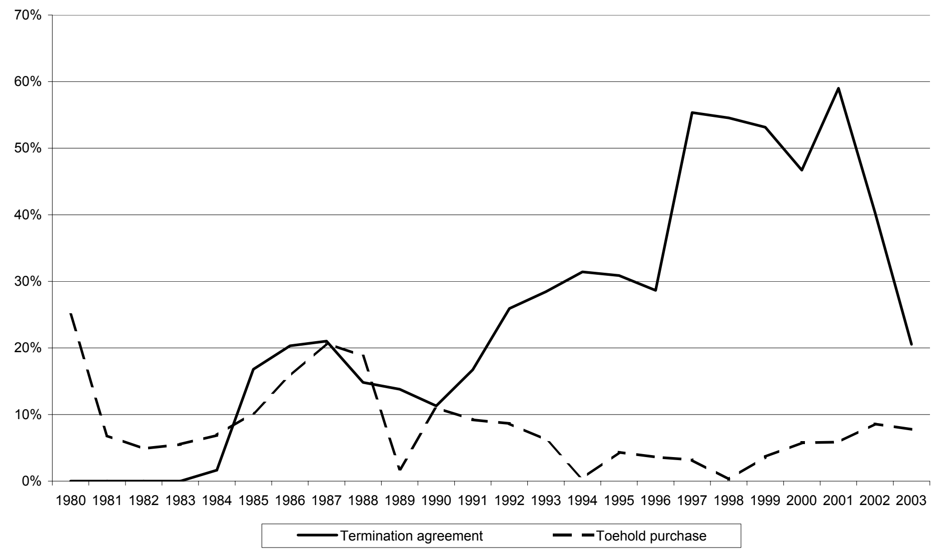


Figure 4

Annual distribution of the percentage of the initial control bids where the bidder has a toehold or a termination agreement (lockup or target breakup fee), 1980-2003.

(A) The initial control bid is a merger proposal (sample size 9,238)



(B) The initial control bid is a tender offer (sample size 3,168)

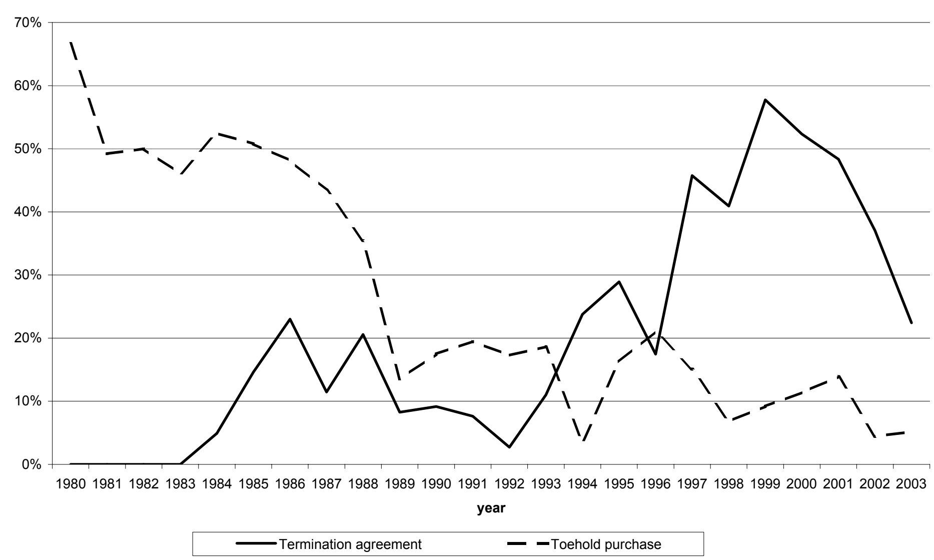


Table 1
Summary of sample selection procedure.

	All Bids	Bids for Control: Merger	Bids for Control: Tender offer	Toehold acquisition
A. Sampling individual bids from SDC, 1/1/1980–6/30/2003				
(1) Total Acquisition Forms, "M", "AP", "AM"; US targets only:[a]	58,246	32,264	8,561	17,421
(2) Sample after requiring target to be publicly traded	25,158	10,748	3,473	10,937
(3) Sample after adjustments based on information in SDC's History File; elimination of duplicate records; and addition of tender offers in WSJ:[b]	24,456	10,166	4,010	10,280
B. Additional cases from Betton and Eckbo (2000)[c]			1,021	628
C. Total individual bids in sample	**26,105**	**10,166**	**5,031**	**10,908**
D. Total number of control contests[d]	**12,723** (100%)	**9,238** (100%)	**3,485** (100%)	
E. Control contest outcomes[e]				
(1) Initial control bidder wins	8,205 (65%)	5,829 (63%)	2,376 (70%)	
(2) Rival bidder wins	679 (5%)	449 (5%)	230 (7%)	
(3) No bidder wins	3,698 (29%)	2,933 (32%)	765 (23%)	

[a]SDC groups transactions into ten different categories, of which we use three: Mergers (transaction form "M"), Acquisition of Majority Interest ("AM"), and Acquisition of Partial Interest ("AP"). We group these transaction forms into "merger", "tender offer" or "toehold acquisition" (also used interchangeably with "acquisition of partial interest"), as follows: A toehold acquisition is any form "AP" transaction where the bidder holds less than 50% and is seeking to acquire less than 50%. A tender offer is any form "M" transaction also flagged by SDC as tender offer or any "AM" transaction. A merger is any form "M" transaction that is not also flagged by the SDC as a tender offer, and any "Tender/Merger" transaction. All merger bids and tender offers are for control, defined as the bidder holding less than 50% prior to the bid and seeking to own more than 50% as a result of the bid.

[b]A bid was eliminated when SDC's case history file provided conflicting information on bidder name, date and classification of bid, or when record was a duplicate of another SDC bid. A search of the Wall Street Journal for tender offers led to the addition of 183 tender offers.

[c]Betton and Eckbo (2000) sample 2,344 tender offers over the period 1/1/1970 through 12/30/1991, using 14d SEC filings and from information in the Wall Street Journal. We use 779 of their tender offers from the 1970s, 1,537 from the 1980s, and 28 from 1990. Of these, 1,466 were not found on the SDC.

[d]The contest starts with the initial control bid. A control bid is the initial bid if there are no other control bids for the same target over the previous six months. A bid is the last in the contest if there are no additional control bids for the same target over the subsequent six months.

[e]Based on information in SDC and the Wall Street Journal. A bid that does not succeed is listed as "withdrawn" by the SDC.

Table 2
Initial control bidder's toehold, classified by target reaction and bid type, 1971-2003.

Sample of 12,723 initial control bids. In a bid for control the bidder owns less than 50% and seeks to own at least 50% of the target shares. The initial control bid is a bid for control where there was no other control bid for the target within the preceding 6 months. A long-term toehold is purchased more than 6 months prior to the initial control bid. A short-term toehold is target shares purchased within the last 6 months prior to the initial control bid. A bidder can have both a long-term and a short-term toehold. The toeholds for 406 tender offers in the 1970s could not be classified as either long-term or short-term.

		Target not hostile		Target hostile	
		Type of initial control bid		Type of initial control bid	
	All contests	Tender offer	Merger offer	Tender offer	Merger offer
All initial control bids					
Number of bids (N_A)	12,723	3,156	9,034	329	204
Number of bids with toehold (N_B)	1,444	656	521	203	64
% of all bids with toehold ($100 * N_B/N_A$)	11	21	6	62	31
Toehold size in % of target shares when toehold > 0					
Average	21	24	21	11	13
Median	17	23	17	8	13
Long-term (LT) and short-term (ST) toeholds					
Bids with classifiable toehold (N_T)	1,038	390	521	63	64
(1) Long-term toeholds					
Number of bids with LT toehold (N_L)	951	366	476	61	48
% of bids with classifiable toehold ($100 * N_L/N_T$)	92	94	91	97	75
% of all bids excluding bids with non-classifiable toeholds ($100 * N_L/(N_A - (N_B - N_T))$)	8	13	5	32	24
LT toehold size in % of target shares when LT> 0					
Average	21	24	20	10	11
Median	17	21	17	8	9
(2) Short-term toeholds:					
Number of bids with ST toehold (N_S)	219	63	117	10	29
% of bids with classifiable toehold ($100 * N_S/N_T$)	21	16	22	16	45
% of all bids excluding bids with non-classifiable toeholds ($100 * N_S/(N_A - (N_B - N_T))$)	2	2	1	5	14
ST toehold size in % of target shares when ST> 0					
Average	13	18	11	4	12
Median	9	15	8	4	9

Table 3
Characteristics of lockups and breakup fees.

The table uses 12,723 initial bids for control, where the bidder owned less than 50% and sought to own at least 50% of the target shares, over the period 1971-2003. A breakup fee is a fix fee that the target pays the bidder if the proposed merger fails. A lockup option gives the bidder the right to purchase a fraction of the target shares at a specific price if a rival bidder wins the target. The information in the table is from SDC. Due to possible data errors we eliminate outliers as follows: termination fees of 30% or higher, lockup options exceeding 40% of target shares, and lockup prices exceeding 150% of the initial premium. The first breakup fee in the sample was in 1985 and the first lockup agreement in 1984. In 1994, Delaware Chancery court ruled against an equity lockup option, but allowed a termination fee grant in *Paramount v. QVC*.

	1984-1994	1995-2003	Total 1971-2003
Number of bids in sample	5,269	6,248	12,723
Panel A: Breakup fee			
Number of bids with fee	318	2,396	2,714
Percent of all bids	6.0	38.3	21.3
Breakup fee in $ million:			
Average	9.9	35.0	32.2
Median	4.5	6.2	6.0
Standard error	0.92	2.85	2.53
N	307	2,384	2,691
Breakup fee as % of target market value of equity:			
Average	5.2	5.9	5.8
Median	4.1	5.0	5.0
Standard error	0.28	0.08	0.08
N	259	1,988	2,247
Panel B: Lockup agreement			
Number of bids with lockup option	502	689	1,191
Percent of all bids	9.5	11.0	9.4
% of target shares granted in lockup option:			
Mean	19.8	19.0	19.3
Median	19.9	19.9	19.9
Standard error	0.32	0.14	0.15
N	419	643	1,062
Lockup option strike price as % of initial offer price:			
Mean	95.4	88.3	88.4
Median	95.2	93.1	93.5
Standard error	6.42	0.94	0.93
N	5	319	324

Table 4

Maximum likelihood simultaneous estimation of regressions for the probability of initial control bidder acquiring a toehold, the probability of target lockup agreement or termination fee, and the size of the offer premium.

The regressions use three different estimates of the offer premium: the initial offer price ($OP1$), the final offer price ($OP2$), and the target stock price on day +1 ($OP3$), all divided by the stock price 61 trading days prior to the announcement adjusted for splits and dividends. Stock prices, turnover and target market value of equity are from CRSP and the remaining information is from SDC and Wall Street Journal. The target is traded at NYSE or AMEX if it is indicated in either SDC or CRSP. p-values are in parenthesis. Sample of 6,971 control contests, 1971-2003.

	Probit: Toehold > 0			Probit: Target breakup fee			OLS: Offer premium		
	$OP1$	$OP2$	$OP3$	$OP1$	$OP2$	$OP3$	$OP1$	$OP2$	$OP3$
Constant	-0.09	-0.23	-0.19	-0.89	-0.97	-0.58	1.06	1.15	-0.37
	(0.705)	(0.471)	(0.153)	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Offer premium	-0.65	-0.74	0.03	0.92	0.70	1.37			
	(0.000)	(0.000)	(0.022)	(0.000)	(0.000)	(0.000)			
Target breakup fee	-0.97	-1.07	-0.49				0.67	0.50	0.55
	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)
Positive toehold				-0.52	-0.46	-0.18	-0.24	-0.39	0.06
				(0.286)	(0.000)	(0.000)	(0.025)	(0.000)	(0.107)
Toehold size				-0.01	-0.03	0.00	-0.00	0.00	-0.00
				(0.899)	(0.000)	(0.684)	(0.890)	(0.017)	(0.408)
Target hostility	0.40	0.52	0.60	-0.68	-0.64	-0.28	0.29	0.18	0.21
	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Poison pill	0.29	0.27	0.22	-0.22	-0.26	-0.17	0.04	0.01	0.04
	(0.186)	(0.037)	(0.201)	(0.492)	(0.131)	(0.033)	(0.551)	(0.938)	(0.470)
Cash payment	0.58	0.44	0.27	-0.40	-0.40	-0.07	0.13	0.15	0.10
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.015)	(0.000)	(0.000)	(0.000)
Tender offer	0.12	0.28	0.38	-0.32	-0.36	-0.31	0.11	0.04	0.20
	(0.447)	(0.007)	(0.000)	(0.008)	(0.017)	(0.000)	(0.054)	(0.472)	(0.000)
Tender-merger	0.37	0.45	0.45	0.68	0.76	0.21	-0.05	0.02	-0.14
	(0.018)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.226)	(0.538)	(0.000)
Turnover change	-0.00	-0.00	0.00						
	(0.000)	(0.016)	(0.006)						
Turnover average	0.00	-0.00	0.01						
	(0.659)	(0.376)	(0.021)						
Target size	-0.06	-0.03	-0.11	0.01	0.05	0.02	-0.09	-0.09	0.01
	(0.004)	(0.265)	(0.000)	(0.697)	(0.001)	(0.068)	(0.000)	(0.000)	(0.013)
NYSE/AMEX	0.18	0.19	0.23	0.07	-0.07	-0.33	0.14	0.10	0.19
	(0.024)	(0.003)	(0.000)	(0.350)	(0.133)	(0.000)	(0.001)	(0.000)	(0.000)
1994 or later				-0.10	0.35	0.34			
				(0.747)	(0.000)	(0.001)			
1997 or later				0.84	0.73	0.36			
				(0.004)	(0.000)	(0.000)			
Number of cases	2,582	4,627	7,630	2,582	4,627	7,630	2,582	4,627	7,630
Log likelihood	-3,941	-7,231	-10,906						
Schwarz Criterion	8,196	14,800	22,169						

Table 5

Estimation of logit regressions for the probability that the initial control bidder acquires an equity toehold in the target and OLS regressions for the toehold size. The implied α is estimated assuming that bidder private values v are distributed uniform.

$$\alpha = \frac{\Pi_{br}}{1-\theta} - v + \sqrt{\frac{\Pi_{br}}{1-\theta}(2(1-v) + \frac{\Pi_{br}}{1-\theta})} \text{ where } \Pi_{\rm br} = \frac{1}{2}(1-\theta)\mathrm{v}^2(1-\mathrm{t})^2 + \mathrm{tv}.$$

The probability θ that the target remains independent is estimated for 12,189 control contests in a probit regression including indicators for cash payment, target hostility, poison pill, tender offer, tender-merger, target traded on NYSE or AMEX, announcement year 1984-1994, 1995-1996, and 1997-2003, and a constant. The target termination fee t is computed as a fraction of target equity market value for 2,281 initial control bidders. For cases with no termination fee, t is set to the average t across the control contests in the announcement year, starting in 1985. The value v is estimated from offer premiums. Three different implied α are estimated using the initial offer price ($OP1$), the final offer price ($OP2$), and the target stock price on day +1 ($OP3$), all divided by the stock price 61 trading days prior to the announcement adjusted for splits and dividends and truncated at 400%. Stock prices, target market values, and turnover data are from CRSP, while the remaining variables are from the SDC data base. The target is traded at NYSE or AMEX if it is indicated in either SDC or CRSP. p-values are in parenthesis. The regressions use a sample of 6,928 control contests in 1985-2003.

	Logit: Toehold > 0			OLS: Toehold size		
	$OP1$	$OP2$	$OP3$	$OP1$	$OP2$	$OP3$
Constant	-3.25	-3.78	-4.01	0.31	-0.91	-1.15
	(0.000)	(0.000)	(0.000)	(0.773)	(0.307)	(0.077)
Implied $\alpha < 4\%$	1.13	0.55	0.38	1.36	1.00	0.77
	(0.000)	(0.002)	(0.001)	(0.001)	(0.006)	(0.003)
Target breakup fee	-1.82	-1.35	-1.24	-2.68	-2.55	-2.04
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Target hostility	0.83	1.06	1.30	-0.61	-0.43	0.43
	(0.000)	(0.000)	(0.000)	(0.364)	(0.526)	(0.430)
Poison pill	0.64	0.56	0.79	1.42	1.32	2.28
	(0.059)	(0.083)	(0.005)	(0.189)	(0.243)	(0.017)
Cash payment	1.52	1.18	1.13	2.32	2.14	2.39
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tender offer	0.44	0.89	0.85	0.30	3.14	2.34
	(0.067)	(0.000)	(0.000)	(0.634)	(0.000)	(0.000)
Tender-merger	0.43	0.64	0.94	0.225	1.19	1.67
	(0.019)	(0.000)	(0.000)	(0.581)	(0.001)	(0.000)
Change in turnover	0.00	0.00	0.00	0.00	0.00	0.00
	(0.499)	(0.894)	(0.763)	(0.656)	(0.965)	(0.992)
Average turnover	0.01	-0.01	-0.01	-0.00	-0.03	-0.03
	(0.292)	(0.559)	(0.163)	(0.914)	(0.09)	(0.051)
Target size	0.03	0.09	0.10	0.16	0.26	0.23
	(0.535)	(0.014)	(0.000)	(0.097)	(0.001)	(0.000)
NYSE/AMEX	0.16	0.08	0.10	0.07	-0.03	0.00
	(0.319)	(0.480)	(0.312)	(0.833)	(0.901)	(0.999)
Number of cases	2,548	4,559	6,928	2,547	4,558	6,927
Cox & Snell R^2	0.12	0.10	0.10			
Adjusted R^2				0.06	0.07	0.06
Log likelihood	1,347	2,567	3,801			
F-value				15.65	31.11	42.92
				(0.000)	(0.000)	(0.000)

Table 6

Total contest abnormal return to targets and initial bidders, classified by the final outcome of the control contest. Day 0 is the day of the initial control bid. Total sample, 1971—2003.

The average cumulative abnormal return reported in this table is

$$\Gamma_{end}^{-61} = \frac{1}{N}\sum_{j=1}^{N}\Gamma_{j,end}$$

where

$$\Gamma_{j,end} = \sum_{k=1}^{K}\omega_k\gamma_k,$$

where ω_k is the number of trading days in window k. The windows run from day -61 through the ending date of the control contest and where day 0 is the announcement date of the initial control bid. The parameter γ_k is estimated using the market model

$$r_{jt} = \alpha_j + \beta_j r_{mt} + \sum_{k=1}^{K}\gamma_{j,k}d_{kt} + \epsilon_{jt},$$

where r_{jt} is the return to firm j and r_{mt} is the market return. d_{jt} is a dummy variable that takes a value of 1 in the specific event window within the period $[-61, end]$ and zero otherwise.
To be included in the sample, we first identified the IPERM number for the firm and required that there be at least 100 days of trading (volume greater than zero) during the period (-251,-62), and at least 2 days of returns in the period (-1,1). The estimation uses ordinary least squares with White's heteroscedastic-consistent covariance matrix, and the estimation period starts 251 days prior to the announcement of the initial bid and ends at the minimum of the target delisting date or 125 days after announcement of the last bid. The z-statistic is

$$z = \frac{1}{\sqrt{N}}\sum_{j=1}^{N}\frac{\Gamma_j^{-61}}{\sigma_{\gamma_j}},$$

where σ_{γ_j} is the estimated standard error of $\Gamma_j^{-61} \equiv \omega_j\gamma_j$. For large sample size N, the z-statistic has a standard normal distribution under the null hypothesis of zero average cumulative abnormal return.

	Initial bid is a merger offer (6,598 targets)			**Initial bid is a tender offer (1,399 targets)**		
	Initial bidder wins	Rival bidder wins	No bidder wins	Initial bidder wins	Rival bidder wins	No bidder wins
			A. Target firms			
Mean	25.61%	16.67%	-9.64%	42.11%	41.14%	2.39%
Median	22.92%	23.48%	-1.69%	39.65%	35.59%	9.86%
(z, % pos.)	(29.09,70.72%)	(7.10,66.88%)	(-2.90,48.57%)	(29.13, 86.73%)	(9.83, 78.81%)	(2.01, 58.00%)
N/Days in contest	4050/161	308/213	2240/192	1115/120	118/164	169/185
			B. Initial bidder firms			
Mean	-5.09%	-16.11%	-18.13%	-4.13%	-6.93%	-12.02%
Median	-4.34%	-7.56%	-11.41%	-2.16%	-5.54%	-4.85%
(z, % pos.)	(-7.30,43.52%)	(-2.41, 45.86%)	(-7.60, 39.00%)	(-3.15, 45.34%)	(-0.47, 34.09%)	(-2.07, 44.85%)
N/Days in contest	3555/163	133/210	1000/191	891/138	88/153	165/185

Table 7
Coefficient estimates for the probability that no bidder wins the target (target unsuccessful) at the announcement of the initial control bid, 1971-2003.

We are estimating the joint probability of the "no bidder wins" nodes in the contest tree in Figure 1. This "target unsuccessful" probability is given by the logit-function

$$F(X_j'\beta) = \frac{1}{1+\exp(-X_j'\beta)}.$$

The explanatory variables for offer j, X_j, are binary (1/0) and self-explanatory except for the following: Toehold = the percent of the target shares held by the initial bidder at the time of the initial control bid; Exchange = 1 if the target is listed on NYSE or AMEX; Pill = 1 if SDC indicates that there is a poison pill associated with offer; Runup (-61, -2) = cumulative abnormal return to target over the period (-61,-2); Premium = offer price divided by the stock price 61 days before the offer date adjusted for splits and dividends. (Asymptotic t-ratio and the marginal impact of the variable on the probability estimate are reported in brackets).

Independent variables X	**Coefficient estimates β (Asymptotic t-value, marginal effect on probability)**		
	Model I	**Model II**	**Model III**
Constant	-1.378	-2.0357	-1.138
	(-10.60)	(-8.285)	(-8.872)
Toehold	-.012	-.0004	-0.016
	(-3.426,-0.002)	(-.091, -0.0001)	(-4.463, -0.003)
Target hostility	1.336	1.873	1.112
	(13.951,0.259	(17.263, 0.249)	(11.657, 0.201)
Cash only payment	1.336	0.749	0.670
	(18.851, 0.221)	(8.756, 0.10)	(10.344,0.121)
Tender offer	-1.8595	-1.472	-1.550
	(-18.869, -0.361)	(-11.759, -0.196)	(-15.365, -0.280)
Exchange (NYSE/AMEX)	0.193	0.091	0.171
	(3.475, 0.038)	(1.086, 0.012)	(3.01, 0.031)
Period 1984-1994	0.160	0.532	0.471
	(1.293, 0.031)	(2.362, 0.071)	(3.852, 0.085)
Period after 1994	-0.551	-0.282	-0.010
	(-4.392, -0.107)	(-1.223, -0.038)	(-0.076, -0.002)
Term. agreement			-1.715
			(-18.21, -0.310)
Poison pill	0.375		0.371
	(1.344, 0.073)		(1.344, 0.067)
Premium		-0.13	
		(-0.245, -.002)	
Number of cases	8,000	4,974	8,000
Mcfadden adjusted R^2	0.13	0.15	0.18
Unconditional probability	0.3011	0.1950	0.3011
Mean Estimated prob. when target unsucc	0.4101	0.3238	0.4384
Minimum	0.0221	0.0219	0.0120
Maximum	0.8609	0.7698	0.8400

Table 8

Estimates of the expected returns to target firms in the "target successful" (the initial or the rival bidder wins) state and the "target unsuccessful" (no bidder wins) state as reflected in the market reaction to the announcement of the initial control bid, 1971-2003.

The table reports the estimates of the parameters μ in the cross-sectional regression

$$\Gamma_j = \mu_{ts} + \mu_{tu} F(X_j'\beta) + \epsilon,$$

where the regressor $F(X'\beta)$ is estimated as in Table 7. Model I through III refers to the model specification for $F(X'\beta)$ in Table 7. The dependent variable Γ_j is estimated as in Table 6 and is the abnormal return to target shareholders cumulated either over the days -61 through day 1, or days -1 through day 1, where day 0 is the announcement day of the initial control bid. The row labelled "Predicted Γ in tu-state assuming Prob(tu)=1 for all" is the average predicted value of Γ when the probability of the target unsuccessful state is set equal to 1 for all cases. The row labelled "Mean predicted Γ in tu-state" is the mean of the predicted Γ's when the target unsuccessful state actually occurs (i.e., predict the Γ for a given firm and then average these predictions for all targets that were actually unsuccessful). The row labelled "Observed mean Γ in tu-state" is the mean of the actual Γ's when the target unsuccessful state actually occurs. (t-values in parentheses).

	Model specification for $F(X_j'\beta)$		
	Model I	**Model II**	**Model III**
A. Dependent variable is Target Γ_1^{-61} (cumulation period is day -61 through 1)			
Constant (μ_{ts})	0.297	0.356	0.303
	(36.40)	(51.62)	(40.89)
Target unsuccessful (μ_{tu})	-0.308	-0.252	-0.327
	(-13.54)	(-10.46)	(-15.91)
Predicted Γ in tu-state assuming Prob(tu)=1 for all	-0.0110	0.1044	-0.0244
	(-.666)	(5.50)	(-1.60)
Mean predicted Γ in tu-state	0.1708	.2745	0.1595
Observed mean Γ in tu-state	0.1109	.2440	0.1109
B. Dependent variable is Target Γ_1^{-1} (cumulation period is day -1 through 1)			
Constant (μ_{ts})	0.181	0.200	0.186
	(42.31)	(49.47)	(46.68)
Target unsuccessful (μ_{tu})	-0.150	-0.093	-0.164
	(-12.57)	(-6.65)	(-15.09)
Predicted Γ in tu-state assuming Prob(tu)=1 for all	0.0318	.1025	0.0218
	(3.71)	(9.15)	(2.76)
Mean predicted Γ in tu-state	0.1200	.1654	0.1138
Observed mean Γ in tu-state	0.0999	.1536	0.0999
C. Dependent variable is Target Γ_{end}^{-1} (cumulation period is day -1 through end)			
Constant (μ_{ts})	0.343	0.391	0.353
	(25.90)	(33.25)	(30.41)
Target unsuccessful (μ_{tu})	-0.561	-0.389	-0.593
	(-14.02)	(-8.31)	(-16.65)
Predicted Γ in tu-state assuming Prob(tu)=1 for all	-.2178	0.0024	-0.2403
	(-7.23)	(0.06)	(-8.67)
Mean predicted Γ in tu-state	0.1132	.2652	0.0929
Observed mean Γ in tu-state	-0.0879	.0565	-0.0879

Table 9

Estimates of the expected returns to bidders in the "target successful" (the initial or the rival bidder wins) state and the "target unsuccessful" (no bidder wins) state as reflected in the market reaction to the announcement of the initial control bid, 1971-2003.

The table reports the estimates of the parameters μ in the cross-sectional regression

$$\Gamma_j = \mu_{ts} + \mu_{tu} F(X_j'\beta) + \epsilon,$$

where the regressor $F(X'\beta)$ is estimated as in Table 7. Model I through III refers to the model specification for $F(X'\beta)$ in Table 7. The dependent variable Γ_j is estimated as in Table 6 and is the abnormal return to target shareholders cumulated either over the days -61 through day 1, or days -1 through day 1, where day 0 is the announcement day of the initial control bid. The row labelled "Predicted Γ in tu-state assuming Prob(tu)=1 for all" is the average predicted value of Γ when the probability of the target unsuccessful state is set equal to 1 for all cases. The row labelled "Mean predicted Γ in tu-state" is the mean of the predicted Γ's when the target unsuccessful state actually occurs (i.e., predict the Γ for a given firm and then average these predictions for all targets that were actually unsuccessful). The row labelled "Observed mean Γ in tu-state" is the mean of the actual Γ's when the target unsuccessful state actually occurs. (t-values in parentheses).

	Model specification for $F(X_j'\beta)$		
	Model I	**Model II**	**Model III**
A. Dependent variable is Bidder Γ_1^{-61} (cumulation period is day -61 through 1)			
Constant (μ_{ts})	-0.005	0.009	-0.006
	(-.80)	(1.44)	(-1.03)
Target unsuccessful (μ_{tu})	-0.019	-0.021	-0.016
	(-0.88)	(-0.75)	(-1.03)
Predicted Γ in tu-state assuming Prob(tu)=1 for all	-0.024	-0.021	-0.0222
	(-1.51)	(-0.75)	(-1.58)
Mean predicted Γ in tu-state	-0.0119	0.0035	-0.0122
Observed mean Γ in tu-state	-0.0241	0.0076	-0.0241
Mean predicted prob in state	0.3509	0.2739	0.3853
B. Dependent variable is Bidder Γ_1^{-1} (cumulation period is day -1 through 1)			
Constant (μ_{ts})	-0.019	-0.020	-0.019
	(-8.61)	(-9.24)	(-9.63)
Target unsuccessful (μ_{tu})	0.026	0.031	0.026
	(4.08)	(3.85)	(4.54)
Predicted Γ in tu-state assuming Prob(tu)=1 for all	0.0072	0.0113	0.0069
	(1.54)	(1.76)	(1.62)
Mean predicted Γ in tu-state	-.0099	-0.0112	-0.0090
Observed mean Γ in tu-state	-.0099	-0.0121	-0.0099
C. Dependent variable is Bidder Γ_{end}^{-1} (cumulation period is day -1 through end)			
Constant (μ_{ts})	-0.069	-0.051	-0.057
	(-5.16)	(-3.77)	(-5.19)
Target unsuccessful (μ_{tu})	-0.051	-0.034	-0.100
	(-1.10)	(-0.48)	(-2.57)
Predicted Γ in tu-state assuming Prob(tu)=1 for all	-.1196	-0.0848	-0.1567
	(-3.31)	(-1.42)	(-4.99)
Mean predicted Γ in tu-state	-0.0865	-0.0601	-0.0954
Observed mean Γ in tu-state	-0.2049	-0.1916	-0.2049

Table 10
The average change in predicted abnormal returns from a unit change in the toehold.

The change in the predicted abnormal returns is computed as

$$\frac{d\Gamma}{dX} = (\frac{\partial F(X'\beta)}{\partial X})(\frac{\partial \Gamma}{\partial F(X'\beta)}) = p(X)(1-p(X))\beta\mu$$

where dX is the change in the bidder's toehold,

$$F(X'\beta) = \frac{1}{1+\exp(-X_j'\beta)}$$

is the cumulative probability (logit function) of the "target unsuccessful" state (tu) given the bid characteristics X and parameter vector β (estimated in Table 7), $p(X)$ is the partial derivative (density) of F, and μ is the vector of parameters estimated from the regression

$$\Gamma_j = \mu_0 + \mu_{tu}F(X_j'\beta) + \epsilon.$$

The vector mu is estimated in Table 8 for targets and in Table 8 for bidders. The marginal effect $d\Gamma/dX$ is estimated for each initial bid and then averaged across the sample.

	Model specification for $F(X_j'\beta)$		
	Model I	**Model II**	**Model III**
A. Dependent variable is Γ_1^{-61} (cumulation period is day -61 through 1)			
Target	0.11979E-02	0.21635E-04	0.1566E-02
Bidder	0.35819E-04	0.10655E-05	0.3719E-04
B. Dependent variable is Γ_1^{-1} (cumulation period is day -1 through 1)			
Target	0.65795E-03	0.14005E-04	0.86424E-03
Bidder	-0.50522E-04	-0.15681E-05	-0.59398E-04
C. Dependent variable is Γ_{end}^{-1} (cumulation period is day -1 through end)			
Target	0.31925E-03	0.51780E-05	0.43225E-03
Bidder	0.97981E-04	0.17189E-05	0.22918E-03
D. Number of observations			
Target	8000	4974	8000
Bidder	4286	3113	4286

Table 11
Markup regressions for targets and initial bidders separately, 1971–2003.

The sample size is 8,000 listed targets and 5, 832 listed bidders. The regression is

$$Markup_i = a + bRunup_i + cX + \epsilon_i.$$

Markup is Γ_{end}^{-1} (the cumulative abnormal return estimated as in Table 6 over the period [-1,min(target delisting, last bid + 125]). *Runup* is Γ_{-2}^{-61} (cumulative abnormal return estimated as in Table 6 over the period (-61, -2). The control variables contained in the vector X are all binary: *Tender* = 1 if the initial offer is a tender offer. *Toe* = 1 if the % of the target held by the initial bidder at the start of the contest is greater than zero. *Compete* = 1 if the number of bids is greater than 1. *Exchange* = 1 if target listed on NYSE or AMEX. *Paymix* = 1 if the method of payment was not 100% cash. Sample contests with no prior partial acquisition events. (t-values in parentheses).

Runup	Tender	Tender * Runup	Exchange	Exchange * Runup	Toehold	Toehold * Runup	Compete	Compete * Runup	Paymix	Paymix * Runup	Constant
A. Targets only											
0.3908											0.0796
(14.76)											(12.71)
R^2 adjusted = .0645											
0.4385	0.14920	-0.2459	-0.0436	-0.0944	0.0430	-0.1427	0.0197	0.0927			0.0694
(12.43)	(10.49)	(-4.69)	(-3.52)	(-1.66)	(2.41)	(-2.05)	(1.02)	(1.01)			(7.63)
R^2 adjusted = .0784											
0.4545	0.1616	-0.2442	-0.0429	-0.0979	0.0512	-0.1494	0.0253	0.0904	0.0826	-0.0573	0.0347
(10.24)	(11.12)	(-4.51)	(-3.47)	(-1.72)	(2.85)	(-2.14)	(1.31)	(0.98)	(6.60)	(-1.08)	(3.15)
R^2 adjusted = .0836											
B. Initial bidders only											
0.4017											-.0836
(8.91)											(-16.27)
R^2 adjusted = .0546											
0.4459	0.0328	-0.3963	0.0292	0.0241	0.0368	.053300	-0.0390	0.1721			-0.0973
(9.10)	(2.66)	(-2.63)	(2.96)	(0.28)	(2.01)	(0.37)	(-2.04)	(1.03)			(-13.86)
R^2 adjusted = .0644											
0.5375	0.0255	-0.4528	0.0298	0.0299	0.0360	0.0455	-0.0413	0.1616	-0.0185	-0.1524	-0.0854
(7.58)	(1.96)	(-3.03)	(3.01)	(0.35)	(1.97)	(0.32)	(-2.16)	(0.97)	(-1.70)	(-1.84)	(-8.78)
R^2 adjusted = .0663											

Table 12
Markup regressions for targets and initial bidders jointly, 1971–2003.

The sample size is 4,286 listed targets and initial bidders. The regression is

$$Markup_i = a + bRunup_i + cX + \epsilon_i.$$

$Markup$ is Γ_{end}^{-1} (the cumulative abnormal return estimated as in Table 6 over the period [-1,min(target delisting, last bid + 125]). *Runup* is Γ_{-2}^{-61} (cumulative abnormal return estimated as in Table 6 over the period (-61, -2). The control variables contained in the vector X are all binary: *Tender* = 1 if the initial offer is a tender offer. *Toe* = 1 if the % of the target held by the initial bidder at the start of the contest is greater than zero. *Compete* = 1 if the number of bids is greater than 1. *Exchange* = 1 if target listed on NYSE or AMEX. *Paymix* = 1 if the method of payment was not 100% cash. Sample of contests with no prior partial acquisition events. (t-values in parentheses)

Target Runup	Tender	Tender * Target Runup	Target Exchange	Target Exchange * Target Runup	Toehold	Toehold * Target Runup	Compete	Compete * Target Runup	Paymix	Paymix * Target Runup	Constant
A. Dependent variable: Target Markup											
0.1751											.0577
(11.55)											(11.64)
R^2 adjusted = .0630											
B. Dependent variable: Bidder Markup											
0.0602											-0.058
(5.78)											(-1.60)
R^2 adjusted = .0151											
C. Dependent variable: Bidder Markup											
0.0938	-0.0002	-0.0230	0.0101	-.0406	-0.166	0.0418	0.0105	-0.0636	0.0196	-0.1935	-0.196
(5.43)	(-0.02)	(-0.84)	(1.48)	(-2.12)	(-1.39)	(1.51)	(1.00)	(-2.40)	(2.64)	(-0.93)	(-2.97)
R^2 adjusted = .0204											
D. Dependent variable: Bidder total AR (-61 to end)											
0.3896	0.0521	-0.1680	0.0596	-.0831	0.0058	0.0596	-0.189	-0.2137	-0.0297	0.0544	-0.142
(8.28)	(2.01)	(-2.22)	(3.68)	(-1.70)	(0.20)	(0.73)	(-0.66)	(-3.43)	(-1.74)	(1.10)	(-9.13)
R^2 adjusted = .1066											