Negotiation, auction, or negotiauction?! Evidence from the field*

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Abstract

We bridge theoretical negotiation and auction literature with real-world practice using a rich, hand-collected bid-level dataset covering high-stakes merger negotiations totaling nearly $5 trillion. Notably, full-scale private auctions are *not* common in selling firms, and many deals starting as auctions switch to negotiations with a single buyer at a later stage. The process often shifts, highlighting the fluid nature. Initiating bidders typically value the target higher and become the eventual winning bidders. Negotiations take about two-to-four months, involving two-to-six offers, with delays related to information asymmetry and valuation uncertainty. Interestingly, final premiums remain similar regardless of bid frequency. About 44% of targets counteroffer, usually settling at a midpoint between their and the bidder's price. Our findings call for further developments in theories that consider the inherent interconnectedness between auctions and negotiations in real-world scenarios.

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Introduction

How can a seller maximize their expected gain through optimal selling strategies? The literature models two main avenues: auctions and negotiations (or bargaining). In auctions, once rules are set, the seller assumes a passive role because competitive pressure arises from bidders competing simultaneously against each other, driving prices upward. The extensive auction literature has focused on different auction types and optimal mechanisms to maximize the auctioneer's surplus (see the review of Klemperer, 1999). Conversely, in negotiations, competitive pressure arises between buyer and seller as the price is determined through their bargaining. Early bargaining studies suggest that assuming perfect information and rational expectations, the parties should immediately reach a mutually beneficial agreement without any delay (Nash, 1950; Rubinstein, 1982). However, trade delays may happen due to strategic reasons, information asymmetry or uncertainty. [1] This study employs unique, hand-gathered data to connect theory with empirical evidence, investigating real-world, high-stakes merger and acquisition (M&A) deal processes.

Although auction and bargaining theory have seen rapid development in recent decades, empirical evidence remains limited. As highlighted in Klemperer (1999), "Testing auction-theoretic models is seen as one of the brightest spots in applied economics." Backus, Blake, Larsen, and Tadelis (2020) also note that "…little evidence has been presented about how people bargain in the field and how prices actually form in real-world negotiations."

Acquiring real-life data poses significant challenges, particularly considering potential shifts in negotiation processes over time. Theories that model sales of firms in the 1980s may not

[1] E.g., Cramton (1984a, b), Fudenberg and Tirole (1983), Fudenberg, Levine and Tirole (1985), Grossman and Perry (1986), Rubinstein (1985), Sobel and Takahashi (1983), Wilson (1987), and Bikhchandani (1992). Cho (1990) studies the impact of two-sided uncertainty about the gains from trade on the delays to trade. Fuchs and Skrzypacz (2010) show that the possibility of the arrival of new bidders can also cause trade to be delayed in equilibrium, as the seller can benefit from their anticipated arrival and potential competing offers. Admati and Perry (1987) and Cramton (1992) illustrate that bargainers may strategically delay negotiations to signal the strength of their bargaining position.

necessarily be applicable to recent decades. An influential paper by Boone and Mulherin (2007) documents that most takeover negotiations in the 1990s took place behind the scenes. Furthermore, Brown, Liu, and Mulherin (2022) explore reasons behind the shift from hostile, public bidding prevalent in the 1980s to a more sequential and discreet process in the post-1990s.[2] Consequently, a significant gap exists in understanding bidding progression and pre-public phase evolution, leading to a need for guiding future auction theories in modeling the corporate control market. These are our primary objectives.

To gain insight into the dynamics of deal-making in real-world scenarios and understand how the choices made by negotiating parties might affect bargaining outcomes in multi-billion-dollar transactions, we manually gather data from Securities and Exchange Commission (SEC) merger filings. We collect the pre-public deal process for 841 acquisitions from 2005 to 2019 and collect both the incidence and value of over 5,000 offers submitted by *all* bidders for the target and counteroffers in the private negotiating phase. Our unique data allows us to document and assess the extent to which existing theories can explain the selling strategies and outcomes in private merger negotiations between sellers and potential buyers. To the best of our knowledge, ours is the first paper to attempt to describe in detail how bidding for the target firm evolves and how the final negotiated takeover price is reached in this critical (and private) period.[3]

There are several reasons why data from the M&A process is invaluable in examining optimal bargaining strategies. First, while private negotiations between potential acquirers and their targets are generally not disclosed publicly in real-time, once a deal is announced, there is a

[2] The authors suggest that the evolution of takeover law and legal cases which strengthened the property rights of targets' boards impacted the depth and nature of takeover auctions over time.

[3] The existing empirical finance literature demonstrates that for most M&A deals there is an active pre-public phase in the negotiating process by which firms are sold (e.g., Boone and Mulherin, 2007). However, little is known concerning the way that bidding evolves during private merger negotiations.

rich trove of information made available to the public (via the SEC) about the course of negotiations that lead to that deal. We observe in these data a time series of bids to buy the target firm, often by multiple bidders, and, frequently, counteroffers by that target. It is rare in economics for the parties to private negotiations to make public disclosures containing detailed information about the negotiations that lead to a deal (e.g., offered prices and the dates on which those offers were made and accepted, rejected, or counteroffered by the seller), but that is exactly what happens in the vast majority of M&A deals.[4]

Second, the dollar amounts at stake in the M&A bargaining process are substantial both in absolute terms and relative to settings examined in the literature. Most existing studies are based in settings where the value of the item being negotiated over is small, while the average deal in our sample involves the purchase of a target firm at a price of more than $5 *billion.*[5]

Third, unlike most prior studies examining consumers' bargaining for retail goods with their own money, buyers *and* sellers in our data are potentially subject to agency problems, as managers of those firms are, effectively, representing their *shareholders'* resources rather than their own (Jensen, 1986). Indeed, in recent years, target shareholders have challenged a vast majority of M&A deals, alleging that the target's board of directors violated its fiduciary duties by conducting a flawed sales process which resulted in an inadequate offer price (Daines and

[4] These disclosures are subject to the SEC's proxy disclosure requirements and are mostly done to minimize the risk that the target, and its board members, are sued after the fact by their shareholders for running a sale process that does not meet those board members' fiduciary duty to their shareholders to obtain the highest possible price for their shares. That explains why we have these unique data in this setting. Furthermore, firms would face substantial litigation risk if they were not truthful in these (ex-post) disclosures about the course of negotiations that led them to a deal. A typical allegation in shareholder lawsuits is that the target board failed to disclose enough information about the private sale process (Daines and Koumrian, 2012). This considerably increases the veracity of those disclosures. See Li, Liu, and Wu (2018) for more details on voting and disclosure requirements of both target firms and bidders.

[5] Other empirical settings generally include transactions with lower-valued goods. For example, Larsen (2021) studies used car bargaining and Jindal and Newberry (2018) examine consumers' willingness to initiate a negotiation when buying home appliances. The average eBay "deal value" studied in Backus, Blake, Larsen, and Tadelis (2020) is $95.

Koumrian, 2012).[6] The most common allegations include the failure to conduct a sufficiently competitive sale or the existence of restrictive deal protections that discouraged additional bids.

The fact that the bargaining in our setting involves substantially more valuable assets, and is essentially under the shadow of shareholder lawsuits, potentially has important implications for negotiating behavior in this market. Intuitively, the large deal sizes in the M&A market may result in what appears to be more optimal bargaining strategies: bargaining over a $5 billion-dollar asset is likely considered more carefully than bargaining over a home appliance or a $95 item on eBay.

We document a series of stylized facts about the M&A deal-making process. We show that the real-world deal process in M&As is extremely fluid, where the nature of a deal (whether negotiation or auction-based) commonly undergoes changes during the sale process. Even deals that stay as "auctions" throughout their process contain elements that deviate from traditional auction models. Sellers commonly engage directly with multiple buyers simultaneously, negotiating for higher prices. This observation blurs the lines between the traditionally separate research areas of auctions and negotiations. In most real-world scenarios, buyers are involved not just in negotiations with sellers, but also in competition with other, often unidentified, competitors. Subramanian (2020) refers to this mix of auction-style and direct negotiation tactics as a 'negotiauction', a common strategy in high-stakes asset transactions.

We classify a deal as a negotiation if there is a single bidder involved throughout the sale process. When the target company interacts with two to seven bidders, we classify the deal as a negotiauction. In cases where the target company reaches out to eight or more bidders, we categorize it as an auction. The cutoff at seven is based on practitioner insights, which suggest that

[6] Daines and Koumrian (2012) report that shareholders challenged over 95% percent of M&A deals valued over $500 million during 2010-2012.

negotiations become exceedingly complex with more than seven participants.[7] Thus, when a target firm initially approaches eight or more potential bidders, it often indicates an intention to stimulate competition among them, rather than engaging in separate negotiations with each. We find that despite potential litigation pressures, most target firms avoid conducting auctions. Among the 841 transactions, 28% of target firms are sold through negotiations, 37% through negotiauctions, and only 35% through auctions. Furthermore, it's common for deals that begin as negotiauctions or auctions to evolve into negotiations with just one bidder in the later stages. Only about 25% of the deals have two or more active bidders (including the eventual winning bidder) in the final phase of the sale process.

In line with the theories proposed in Dimopoulos and Sacchetto (2014) and Gorbenko and Malenko (2022), we observe that in deals initiated by bidders, more than 70% result in the initiating bidders emerging as winners. This suggests they place a higher valuation on the target compared to other potential competitors. The majority of deals require two to four months to finalize the negotiation of offer prices, with less than 20% reaching an agreement within one month. As theories predict, delays in reaching an agreement correlate with factors like information asymmetry, valuation uncertainty, and the presence of alternative options (e.g., Cho, 1990; Cramton, 1992; Fuchs and Skrzypacz, 2010). On average, winning bidders submit three to four bids before finalizing a deal. This supports Daley and Green (2020)'s prediction of bidders experimenting with their offers. However, the final premiums appear to be largely unaffected by the different rounds of offer negotiations.

Contrary to Samuelson (1984)'s bargaining model, which posits that a buyer maximizes expected profit by making a first-and-final offer, we find that only 8% of bidders appear to employ

[7] Xerium CEO Tom Gutierrez: "You can't really handle more than seven serious bidders. It's incredibly time-consuming," (Subramanian (2020).

this strategy and purchase the target firms at their first (and best) offers. Additionally, in deals where financial bidders acquire target firms, 54% are initiated by financial buyers, 39% are initiated by the target firms themselves, and only 7% are initiated by strategic buyers. These results support Gorbenko and Malenko (2022)'s prediction that a strategic bidder is much less likely to approach a target firm to initiate a deal if the common component of bidders' values is sufficiently high, thereby attracting financial bidders. However, these results also challenge their prediction that these auctions should predominantly be initiated by sellers themselves.

Furthermore, our findings challenge Bulow and Klemperer's (1996) theory, which posits that the competitive edge provided by an additional bidder in an auction supersedes any sophisticated negotiation strategies. We find that two-thirds of targets are sold through negotiation or negotiauction. The results are more consistent with Hansen's (2001) perspective on 'competitive information costs' associated with auctions. Hansen (2001) explains that while disclosing confidential information to potential buyers can enable them to better assess synergies and potentially offer higher prices, this disclosure risks leaking sensitive details about new products, product lines, R&D plans, etc., to potential rivals, thereby diminishing the firm's value. This could be a key reason why many target firms opt against holding a full-scale auction, dispute it being the most effective way to fulfill their fiduciary duties. Moreover, in cases where an auction initiated by the target firm attracts only one interested party, resulting in a 'failed auction,' the observed deal premiums are substantially lower, ranging from 15%-19%.

Similar to Backus, et al. (2020), who document a pattern of splitting price differences in eBay transactions, we find that when target firms make counteroffers, the midpoint rule plays a crucial role even when negotiating high-stakes deals. Although this bargaining pattern ("splitting the difference") is inconsistent with any existing theory of rationing bidding, it is rather intuitive:

the midpoint of the offer and counteroffer is most likely to be the final deal price. This behavioral norm has been explored by experimental and behavioral studies suggesting that fairness, or the perception of fairness, affects the allocation of rewards or costs (e.g., Veuglers and Kesteloot, 1996; Dasgupta and Tao, 1998; Charness and Rabin, 2002; Hauswald and Hege, 2003; Andreoni and Bernheim, 2009).

Our novel empirical evidence highlights the need for theories considering the inherent interconnectedness and fluidity between auctions and negotiations in practical settings. Much of the existing literature treats auctions and negotiations as two separate areas of research. Moreover, the fundamental changes in the takeover process since the 1990s challenge some common assumptions in earlier auction literature. For instance, traditional auction theories often assume that the seller becomes a passive player once the auction process begins. We show, however, that the target firm is rarely a passive participant, even if the process starts with a full-scale auction. Indeed, the scope of negotiations goes beyond just determining offer prices; it also includes negotiating the sale process itself, reflecting the adaptable and fluid nature of M&A deal-making.

Moreover, when it comes to modeling a sequential bidding process, it is often assumed that the initial bidder can indicate their valuation and discourage other bidders through a preemptive jump bid.[8] This strategy was more common in the 1980s when hostile, public bidding was usual, but it is much less frequent now. Since the 1990s, an early step in private negotiations usually involves the bidder signing a confidentiality/standstill agreement with the target firm, gaining access to non-public information.[9] Consequently, most bidders forgo the chance to make a public preemptive bid or a hostile offer, opting instead to enter a standstill agreement during the private

[8] E.g., Fishman (1988), Bulow and Klemperer (2009), Roberts and Sweeting (2013), and Davis, Katok, and Kwasnica (2014).

[9] Standstill provisions prevent potential buyers from announcing a bid without the target's prior consent, buying shares, or lunching a proxy contest for a period of time from the conclusion of the sale process (Sautter, 2012; Hwang, 2015).

negotiation phase in return for confidential information from the target firm. However, it is not uncommon for a bidder to attempt a private preemptive bid, offering a relatively high price contingent upon the target firms agreeing not to entertain other bidders.

Our paper is related to a small but growing literature studying real-world bargaining strategies and outcomes. Most studies focus on bargaining for retail goods (e.g., Crawford and Yurukoglu, 2012; Keniston, 2011; Jindal and Newberry, 2018; Backus, Blake, and Tadelis, 2019; Backus, Blake, Larsen, and Tadelis, 2020; Larsen, 2021). Bagwell, Staiger, and Yurukoglu (2020) study international negotiations on trade policy. Hernandez-Arenaz and Iriberri (2018) study gender differences in wage bargaining. We add to this literature by providing a comprehensive picture of real-world M&A negotiations within deals totaling nearly $5 trillion in aggregate value.

1. Sample formation and key variables

1.1. Sample formation

To construct our sample, we begin with M&A transactions announced from 2005 to 2019 from the Thomson One Banker SDC database (hereafter, SDC). We only include completed deals in which there is a winning bidder in each takeover contest. We further impose standard filters and then merge with the Center for Research in Security Prices (CRSP) to obtain target-firm stock prices and returns, and with the Compustat database to obtain accounting information.[10] The stock price and accounting variables that we collect from these databases are defined in Appendix A; these variables are commonly employed in empirical tests in the M&A literature (often as control variables). We also require that definitive merger agreement is available on the SEC's Electronic

[10] We impose the following filters: 1) the deal is classified as a "Merger (stock or asset)"; 2) the target public status is "Public"; 3) the deal value reported by SDC is at least $1 million; 4) the acquirer holds less than 50% of the shares of the target firm before the deal announcement and seeks to purchase 50% or more of the shares of the target firm after the deal; and 5) the deal status is "completed."

Data Gathering and Retrieval (EDGAR) website so that we can collect detailed information about the private sale process and bidding behavior.

We further constrain our sample to include only target firms in the S&P 1500, and we justify this constraint with two reasons: 1) S&P 1500 firms often transact in large deals that are economically significant and involve substantial transfers of value. It is not uncommon for researchers to focus on the largest M&A deals and investigate their outcomes due to their economic importance.[11] 2) The restriction to S&P 1500 firms produces a manageable sample size, which enables us to thoroughly investigate each deal and collect intensive information discussed below.

Netter, Stegemoller and Wintoki (2011) note that researchers need to consider the tradeoff between deal representativeness and depth. On the one hand, researchers can study a broad sample using data that are publicly available. One disadvantage of this approach is that these readily available databases often do not contain detailed information for each transaction, which is crucial for our study. On the other hand, researchers can conduct case studies where all characteristics of a single deal can be studied in much greater detail. An obvious caveat of this approach is its representativeness. As a result of these tradeoffs, we choose a balanced approach by limiting our sample to S&P 1500 firms, which yields a sample of economically important deals and also makes the intensive hand-collection process manageable. Our final sample contains 841 M&A transactions, each of which encompasses a deal process to buy a publicly traded target firm.

1.2. Key hand-gathered variables

For each of the 841 completed deals in our sample, we carefully read the definitive merger agreement to hand-gather the following data. We record the deal initiation date, defined as the first

[11] For example, Ahern and Sosyura (2014) start with the largest 1,000 deals in the SDC database and end up having 507 acquisitions in their final sample. Aktas, de Bodt, and Roll (2010) require deals in their sample to be larger than $100 million.

date on which contact is made between the target and any bidder (with that contact leading to a signed definitive merger agreement, not necessarily with the initiating bidder). Additionally, we collect the date on which the winning bidder signed a confidentiality agreement, allowing access to private data about the target firm.

We further identify the party that initiated the deal: the eventual winning bidder, an eventual losing bidder, a third party such as an investment bank, the target itself, or a mutual initiation.[12] We collect the entirety of all bids, including prices and dates, submitted by any bidder in the private negotiation process, as well as counteroffers made by the target. These bids can be either specific numbers or ranges. Range bids specify minimum and maximum prices and are more commonly observed early in the deal process, while specific-price bids are more commonly observed later in the deal process. In total, we manually collect 5,281 offers including 4,696 bids and 585 target counteroffers. Appendix B.4 provides an example illustrating how we collect each bid and the associated bid date.

One important facet of the data contained in the publicly disclosed merger agreements is that, typically, only the identity of the *winning* bidder is identified in the merger proxy filing. While competing bidders are not identified by name,[13] the filings often contain useful information about these competing yet unsuccessful bidders. This information includes specifics such as whether they operate in the same industry as the target firm and whether they are a financial or strategic buyer. We therefore collect this data, when possible, to test theories on the dynamics between financial versus strategic bidders (Gorbenko and Malenko, 2014, 2022). Appendix B.5 provides an example illustrating how we identify a bidder as a strategic or financial buyer.

[12] Occasionally deals are mutually initiated by acquirer and target, for example via a conversation at an industry conference.
[13] And are often referred to by pseudonyms, such as "Bidder A", "Bidder B", and so on.

Our comprehensive data on all bids submitted by every bidder for each target enables us to track the number of bidders who submit an indication of interest, either with a proposed acquisition price range or a specific offer price, during the private negotiation phase. This information allows us to calculate the round of bids submitted by each bidder. However, not all bidders who participate in the process eventually submit a bid price. We therefore also collect data on the number of initial contacts and the number of bidders who sign a confidentiality agreement. This information is crucial for understanding how the deal process unfolds, tracing the transition from early interactions to the more advanced stages of negotiation.

We also gather detailed data on the terms of the merger contracts. Specifically, we identify whether the final merger agreement contains a 'go shop' provision, which permits the target firm to publicly solicit and evaluate offers from other bidders for a limited period of time following the signing of a definitive merger agreement, as modeled by Chen and Wang (2023). We also determine whether the target and the winning bidder signed an exclusivity agreement during private negotiations. This agreement typically awards the bidder a period, often 30 to 45 days, in which the target firm agrees not to solicit, engage with, or negotiate with any other potential bidders.

Lastly, we calculate premiums relative to the target's public stock price that is implied by the bids. All premiums are measured relative to a benchmark price for the target's shares. As in Eaton, Liu, and Officer (2021) and Brown, Liu, and Mulherin (2022), the benchmark price we use is the target's public stock price one day prior to the private deal initiation date, as previously defined. We calculate the premium implied by the first bid the target receives, either as a specific-price bid or the mid-point of a range bid, scaled by the benchmark price for the target's publicly traded shares, minus one. Final offer premiums are calculated as the offer price per target share

specified in the definitive merger agreement divided by the benchmark price, minus one. We also calculate the percent offer-price revision between consecutive bids by the same bidder.

1.3. Sample overview and summary statistics

Table 1, Panel A presents the temporal distribution of our sample. There are no obvious merger waves (Andrade, Mitchell and Stafford, 2001; Harford, 2005) in our data because our sample is from 2005 to 2019 and the level of merger activity in that time period had little variability. Panel B of Table 1 contains descriptive statistics concerning our hand-collected bid data. For the 841 deals in our sample, we hand-collect 4,696 bids (both winning and losing). The average number of bids per deal is around five to six and is stable over the years in our sample period.

Interestingly, the average number of counteroffers by the target firms in those acquisitions is considerably lower, averaging around 0.5 to 1 per deal in our sample years. This generally reflects what was apparent to us as we were collecting the data: bidders make many more bids than targets make counteroffers (by a magnitude of about six to nine times on average). The most frequent reaction by targets to offers by bidders is some variant of "no, that bid undervalues our firm" without hinting at what the target management believes the value (per share) of their firm is (i.e., without making a numeric counteroffer). Even restricting our attention to eventual winning bidders, those bidders make about four to five times as many offers throughout the sale process as do the target firms.

Table 1, Panel C presents summary statistics for deal and target-firm characteristics. All variables are defined in Appendix A. The mean (median) deal value is $5.6 ($2.2) billion. About 15% of our deals involve tender offers and 59% of the deals are financed entirely with cash. Sixty-seven percent (21%) of deals have winning bidders that are publicly traded firms (financial buyers)

and only 3% of deals involve bidders with a toehold of more than five percent of the target's stock prior to the merger announcement. Overall, these summary statistics show that the intertemporal patterns and deal characteristics in our data mirror prior research using samples of publicly traded targets.

2. The (fluid) deal making process

2.1. The timeline and key steps

The deal process in mergers and acquisitions is known to be remarkably fluid.[14] Reading through the real-world descriptions (e.g., Subramanian, 2020) of how M&A deals evolve from initiation to completion leaves one with the impression that few-to-no M&A deals fit the strict characteristics and assumptions of theoretical models of either one-on-one negotiations or many-on-one auctions. In this section, we attempt to describe the broad aspects and specific details that we have learned from our hand-collecting process and that show through in the resulting data.

Figure 1 details important steps in the timeline of M&A deals. Starting with the timeline in the middle of the figure, we lay out the common markers that we observe in real-world deals (the dots), from deal initiation (the first date on which contact is made between the target and any bidder, with that contact leading to a signed definitive merger agreement) at the left end of the timeline and public deal announcement on the right. Along the way, there are first bids by winning and losing bidders, counteroffers by the target (if any), and final bid(s) leading to the signing of a merger agreement.

The main purpose of this figure is to document how long (in calendar days) is the median gap between these important events. Starting with the numbers above the timeline (for the full

[14] For example, Subramanian (2020), p.129.

sample and for winning bidders), the time between deal initiation (the start of the deal process) and public deal announcement (the end of the private negotiation process) has a median of 144 calendar days. The winning bidder makes their first offer for the target firm a median of 70 days after that target becomes "in play", and then is involved in negotiations (or an auction, competing against other bidders) for a median of 55 days before public deal announcement.

The numbers below the timeline present median calendar days between key points in a deal for specific subsamples of our data, out of which come some interesting statistics about deal timing. Ex-post, the timing of bids is very elongated in the 188 deals in our sample where the first bidder is not the winning bidder. In that subsample, the first bid the target receives (from an ex-post losing bidder) is received a median of 57 days after first contact with the target, and then (at the median) the eventual winning bidder does not submit their first bid for another 73 days. Deals where the first bidder is not the winning bidder are, almost by definition, more competitive deals than those where the winning bidder makes the first offer to the target. The competitive nature of these deals appears to substantially delay the early part of the deal process, but progress from that first offer by the winning bidder until deal completion does not appear to be similarly affected.

Figure 2 contains a histogram of the duration of offer price negotiations (in calendar days). The start of this period is the receipt of the first offer by the target from any bidder, while the end of this period is the date that the definitive merger agreement is signed. Clearly the bulk of this distribution is in the 1-month to 3-month range (consistent with the 55-day median in Figure 1), although there are about 50 deals that are negotiated very quickly (10 calendar days or less) and about 130 deals that take more than six months to finalize the merger terms. Unlike the immediate agreement predicted in Nash (1950) and Rubinstein (1982), our results clearly show delays in real-world M&A price discovery. Later in this paper, we investigate whether these significant delays

are plausibly related to information asymmetry, the possibility of the arrival of other competing bidders, or signaling (e.g., Samuelson, 1984; Admati and Perry, 1987; Cramton, 1992; Fuchs and Skrzypacz, 2010).

Figure 3 illustrates the fluidity of the deal-making process in the M&A market. Referencing Figure 1 in Brown, Liu, and Mulherin (2022), a takeover auction can be initiated by either the target or a potential bidder. Following initiation, the target firm determines the number of potential bidders to engage, starting an iterative bidding process. Selected bidders gain access to confidential information upon signing a standstill contract, which binds them from making an offer without approval from the target's board of directors. A subset of the bidders who sign confidentiality and/or standstill agreements make nonbinding indications of interest. This information is used by the target firms to invite a subset of bidders for further due diligence and subsequent bidding rounds. The conclusion of the private sale process involves the public announcement of the takeover agreement, subject to shareholder and regulatory approval.

For simplicity, we streamline Figure 3 to focus on the initial and the final stage to highlight the progression of the process. Beginning from the left side of the figure, there are 237 deals in our sample (approximately 28%) where only one bidder is involved in the deal at both the initial and final stages. These 237 deals are pure one-on-one negotiations in which the target is only contacted by (or contacts) one bidder and does not ever solicit (or receive) interest from third parties. This 28% of our sample is the sole group in our data that might cleanly fit with a theoretical model of negotiation from the economics literature, and likely is consistent with one's priors about "negotiations" as defined in, for example, Boone and Mulherin (2007).

On the right side of the figure, there are 297 deals, about 35% of the total, which initiate as auctions involving eight or more contacts. Among these 297 auctions, despite engaging numerous

potential buyers, 39 target firms attract only one interested bidder who submits a non-binding indication of interest. We categorize these deals as 'failed auctions' due to the absence of significant competition among potential bidders. Approximately 44% of the initial auction deals reach the final stage with just one bidder involved. During this final stage, defined as the one-month window around the date of the last bid submitted by the winning bidder (i.e., two weeks before or after the winning bid), no additional bids are submitted by other bidders. Among the remaining 128 deals, approximately 43% of the auction deals, there is at least one more bidder competing with the winning bidder within this final stage. This subset, comprising about 15% of the full sample, more closely resembles an 'auction' as defined in the literature, characterized by the involvement of multiple bidders throughout the bargaining process.

The largest portion of the sample, approximately 37%, falls into the category of 'negotiauction,' involving target firms in contact with two to seven bidders. Within this subset, about 70% transition to negotiation with a single bidder during the final stage, while the remaining 30% involve two bidders competing in the final stage.

The insight from Figure 3 suggests that while the standard practice in literature categorizes M&A samples as either 'auction' or 'negotiation,' real-world deals often exhibit a fluid process that evolves over time. For instance, a significant majority of the initial auction deals (constituting 57% of that subset) shift into one-on-one negotiations before the public deal announcement. This demonstrates the dynamic and evolving strategies employed by acquirers and targets during the non-public phase of M&A deal-making.

2.2. Descriptive statistics

Table 2, Panel A presents summary statistics on deal initiation and the number of bidders involved at the various stages of the deal process. Twenty-six percent of the deals in our sample

are initiated by the target firm itself.[15] This is generally thought of as an admission of weakness in the M&A literature, as targets that are "seeking strategic alternatives" (typical market parlance for a firm putting itself up for sale) are generally doing so under duress.[16] Around 64% of the deals in our sample are initiated by a bidder, with over 72% of those being initiated by the eventual winning bidder. The relatively small proportion of deals initiated by eventual losing bidders (28% of bidder-initiated deals) is consistent with models developed in Dimopoulos and Sacchetto (2014) and Gorbenko and Malenko (2022) predicting that initiating bidders, on average, are stronger and have a higher valuation for the target, suggesting that the majority of the bidders who initiate a deal should eventually be winning bidders. About 10% of the deals in our sample are initiated mutually by the acquirer and target [17] (or, infrequently, by a target shareholder or financial intermediary) and 49% of the deals are initiated by a strategic buyer (as opposed to a financial buyer: see Gorbenko and Malenko, 2014; Martos-Vila, Rhodes-Kropf, and Harford, 2019).

Panel B of Table 2 explores the interaction between deal initiation and winning the takeover contest, conditional on the type of bidder (financial vs. strategic buyers). The results in Table 2, Panel B show that among the 162 deals in which the winning bidder is a financial buyer, 39% are initiated by the target firms themselves, 54% are initiated by financial buyers, and only 7% are initiated by strategic buyers. Similarly, in the 587 deals in which the winning bidder is a strategic buyer (indicating high private values), financial bidders are much less likely to approach a target (financial buyers initiate only 6% of deals that are eventually won by a strategic bidder).[18]

[15] This fraction is comparable to other studies investigating target deal initiation in M&A (Heitzman, 2011; Masulis and Simsir, 2018).
[16] Typically, either because a large shareholder is advocating for corporate change or because the target's business is underperforming (or both).
[17] 100% - 26% - 64% = 10%; Mutual initiation is when neither bidder nor target exclusively commences discussions about a deal, but instead representatives from each firm meet during an industry conference (or other occasion) and mutually initiate discussions about the possibility of a business combination.
[18] In the model in Gorbenko and Malenko (2022), financial buyers (e.g., private equity firms) have values for the target firm that have a high common component (since they adopt similar financial engineering strategies post-acquisition

These results support the prediction from the model in Gorbenko and Malenko (2022) that a strategic bidder is much less likely to approach a target firm (i.e., initiate the deal) if the common component of bidders' values is sufficiently high (i.e., deals with competitive financial buyers). Nevertheless, these results pose a challenge to their prediction that these auctions should primarily be initiated by sellers themselves.

The percentages in the right two columns of Panel B in Table 2 show that among deals initiated by strategic buyers, 81% of them become the winning bidders, compared to only 48% in deals initiated by financial buyers. Given the fluidity and competitiveness of the private M&A deal process, it appears that financial buyers are more likely (relative to strategic buyers) to drop out of contention as the deal process results in higher prices for the target firm (Bargeron, Schlingemann, Stulz, and Zutter, 2008).

Panel C of Table 2 provides summary statistics for the deal process, capturing many of the elements discussed earlier in this paper. In the average deal in our sample, the target contacts 11 potential bidders, engages in a confidentiality agreement with almost 5 of those, and receives bids from about 2 of those (each of which submits and average of around 3 bids). Financial buyers submit bids in 32% of the deals in our sample (but they only win in about 21% of our deals) and the target counteroffers at least one of the bidders in 44% of the deals in our sample. This average is consistent with the general trend discussed earlier: bidders submit bids a lot more than targets submit counteroffers. Approximately 9% of the deals include a go-shop provision. Around 20% of the target firms signed an exclusivity agreement at some stage in the negotiation process.

and have limited ability to extract traditional operating synergies). When the common component of valuations is high, therefore, a takeover contest is more likely to involve financial buyers, and strategic bidders are less likely to participate/initiate. Similarly, when the private component of valuations is high (i.e., the target is sold to a strategic buyer), a takeover contest is less likely to involve financial buyers and those bidders are less likely to participate/initiate.

Notably, 35% of the deals encounter some form of 'early' M&A event, which emphasizes the need to use the pre-initiation target stock price as the benchmark price for the target's shares, as information about deals being negotiated appears to frequently leak out to the market.[19]

2.3. Regression analysis of the deal process

2.3.1. Deal initiation

Table 3 presents a regression analysis focused on the initial phase of the deal process: deal initiation. This analysis examines the factors influencing the party initiating the deal—whether it's the bidder (strategic or financial) or the target. The first independent variable is intended to capture the potential number of viable bidders available in the market for a given target firm. The variable labeled *No. potential same industry buyers* is the number of firms in the CRSP universe that share the same two-digit Standard Industrial Classification (SIC) code as the target firm and have higher equity market capitalization than the target. In other words, this variable is a rough measure of the size of the potential bidder pool for a target firm: competitors in the same line of business that are larger than the target (as acquirers in most M&A samples are considerably larger than their targets).

The second independent variable is intended to capture whether the target firm occupies a niche in its product market space. This variable, labeled *Target product uniqueness*, is based on data made available by the authors of the Hoberg and Phillips (2010) study. Those authors generate similarity scores (bounded between zero and one) between all firms in the CRSP universe based on product market descriptions from their mandatory annual filings with the SEC. The variable we use, *Target product uniqueness*, is one minus the average similarity score between the target firm and its 10 nearest neighbors based on these similarity scores. If a firm has a product market

[19] An early M&A-related event can be one of the following: takeover rumors, news articles (or other media speculation), 13d filings by a potential bidder, or announcements by the target firms that they have hired financial advisors or are seeking strategic alternatives (indicating a likely sale of the company).

description that is very similar to that of many other firms (i.e., is *not* unique) then it will have a very high similarity score and a low *Target product uniqueness* (and vice versa for firms with unique products).

The evidence in Table 3 suggests that greater potential competition among strategic buyers (i.e., higher *No. potential same industry buyer*) makes it less likely that financial buyers will initiate the sale process. This result seems intuitive in that potential high competition among strategic bidders discourage financial buyers to approach the target firm and initiate the sale process. Financial buyers are also less likely to initiate deals for larger, less profitable targets that have had higher stock returns in the past year. They are more likely to approach targets that offer unique products. These results suggest that financial buyers tend to avoid bidding on highly valued targets that manufacture similar products to their competitors. Instead, they prioritize the profitability of their targets in order to service the debt that financial buyers frequently saddle their targets with.

2.3.2. Determinants of early-stage bidder participation

Table 4 reports a regression analysis of the determinants of early-stage bidder participation. The dependent variable in column (1) is *number of buyer contact*, a continuous number capturing the number of potential buyers that the target firm was in contact with during the negotiation process. Column (1) reports OLS regression results. We find that targets that occupy a unique position in their product market space invite more bidders to participate once the sale process is initiated. Such targets offer potential product diversification advantages to buyers, likely contributing to target firms' choice to engage with a larger pool of buyers. Additionally, target firms that are larger in market capitalization contact fewer buyers, likely due to a smaller pool of potential suitable bidders.

As a robustness test, columns (2), (3), and (4) report the marginal effects of ordered probit regressions. Column (2) reports the probability of negotiation, with a positive (negative) coefficient indicating a higher (lower) likelihood of having only one buyer in the process (i.e., a negotiation). Similarly, column (3) reports the probability of a negotiauction and column (4) reports the probability of an auction. Overall, the results are largely consistent with the OLS results reported in column (1). In addition, the ordered probit regression results suggest that target firms with high R&D expenditure are more likely to conduct auctions and less likely to engage in one-on-one negotiations. Given the valuation uncertainty of R&D investments, an R&D-intensive target firm appears to maximize the chances of identifying a bidder with the highest valuation by conducting auctions.

2.3.3. Determinants of merger negotiation strategies

In Table 5, column (1), we investigate how target firm characteristics are related to their decision to make a counteroffer to interested bidders. We find a strong negative relation between the number of *actual* competing bidders (*No. of buyer contact*) and the likelihood of making counteroffers. This result suggests that the competition among bidders reduces the need for the target firm to make a counteroffer. The coefficient on the number of *potential* bidders is insignificant in column (1), consistent with the argument in Bulow and Klemperer (1996, 2009) that potential competition is not a good substitute for actual competition. We also find that target firms with significant R&D investments and those offering unique products are more prone to making counteroffers, again consistent with the notion that such targets benefit from price discovery due to the uncertainties surrounding their valuations.

In columns (2) and (3) of Table 5 we examine how target firm characteristics are related to the parties' decision to sign an exclusivity agreement (i.e., negotiate exclusively for a certain

period of time) or to include a go-shop provision in the merger agreement eventually signed by the winning bidder. In column (2) we find a negative relation between the number of actual participating bidders and the parties signing an exclusivity agreement, indicating target firms are less likely to accept such an agreement when many bidders participate in the process. In contrast, the relation between the number of *potential* bidders in the target's industry and the probability of having an exclusivity agreement is positive, indicating that bidders are more likely to request negotiating exclusivity when potential competition is high.

When we examine the probability that the signed merger agreement includes a go-shop provision (column (3)) we find that go-shops are less likely if the target firm is more mature. We also find a positive relation between target product uniqueness and the inclusion of a go-shop provision. Our interpretation of this result is again that a firm occupying a niche in its product market space is an attractive target to bidders who seek diversifying acquisitions. As a result, it is unclear which industry buyer would be willing to pay the highest premium. Therefore, the target firm wants to maximize its expected sale revenue by contacting more bidders during the process as we show in Table 4 and also including a go-shop provision in the signed merger agreement in case a potential bidder with a high valuation is missed during private negotiations.[20]

2.3.4. Determinants of agreement delay

Given the noticeable delay of agreement and the extensive theoretical research on this topic, we explore how target characteristics are related to the offer negotiation duration in Table 6. The dependent variable is the total number of calendar days between the first offer received by the target firm and the date of the merger agreement. Not surprisingly, we find robust evidence that the number of *actual* bidders is positively related to the duration of offer negotiations.

[20] In untabulated results, we confirm that target firms with unique products are significantly more likely to be sold to a buyer from a different industry (i.e., in a diversifying acquisition).

Additionally, firms with higher information asymmetry, as measured by firm size, take longer to negotiate merger terms. This is also true for firms with unique products, as valuing them is challenging due to the absence of comparable companies and difficulties in forecasting future cash flows. These findings align with theories suggesting that delays in agreement are related to information asymmetry, valuation uncertainty, and the possibility of alternative options (e.g., Cho, 1990; Cramton, 1992; Fuchs and Skrzypacz, 2010).

We also find that the duration of offer negotiations is significantly shorter when acquiring a target firm with high growth potential, as measured by Tobin's Q, or high returns in the past year. This result indicates that delays are particularly costly in such acquisitions. The underlying reason is likely that reaching an agreement quickly allows the acquirer to capitalize on the target firm's growth opportunities sooner, through strategies like investment reallocation (Levine, 2017).

3. Offer prices, bidding strategies, and the role of the deal process

3.1. Descriptive statistics on premiums and bid revisions

In this section, we investigate how target firm characteristics are related to bidding behavior and how the deal process is related to the final offer price. Table 7 presents summary statistics for offer prices and price revisions during the private negotiation period. We first present premiums and bid revisions for all bidders and then separately report these for winning bidders only. For all bidders (including both the winning and losing bidders), the average (median) initial bid premium offered is 29.4% (26.9%), and about 45% of the initial bids contain a price range.[21]

On average, bidders increase offer prices (relative to the target's pre-initiation stock price) by 3.9% each time they revise their offers. Bidders, however, do not always increase offer prices.

[21] For initial bids that contain a price range instead of a specific number, we use the midpoint to calculate the premium.

About 17% of bid revisions are negative, meaning the price in the subsequent offer is lower than the price in the previous offer. The average winning bidder's first bid premium is 28.6%, which is very similar but slightly lower than other bidders. On average, each revision made by the winning bidder is 3.8%, again very similar to other bidders, although we know from Table 2 that winning bidders submit more rounds of revisions. Further, when target firms make counteroffers, the average first counteroffer implies a premium of 42.0%. The final negotiated offer premium is, on average, 38.2%, indicating that target firms are able to improve the merger consideration received by their shareholders by approximately 10% through negotiation and bargaining.

3.2. Regression analysis of bidding strategies

Table 8 reports the results of analyses of how bidding behavior (by all bidders) is related to target firm characteristics. The first three columns examine strategies for submitting initial bids. The dependent variables include the first bid premium (column 1), whether the first bid is a price range rather than a specific number (column 2), and the extent of this range conditioning on the initial bid is a range (column 3). Column (4) reports regression results on bid revisions. Column (5) examines the likelihood of receiving a downward price revision. Finally, column (6) presents results regarding the number of offers submitted by each bidder.

We find that larger firms are less likely to receive a price range in the initial bid, and even if they do, the price range is smaller. More mature firms receive lower first bid premiums and a smaller price range in the initial offer, but higher bid revisions and a lower likelihood of receiving downward revisions. Firms with higher stock returns in the year prior to negotiations receive lower first bid premiums and a smaller price range in the initial offer, suggesting that bidders are less willing to offer high premiums if the target firm's stock has experienced substantial recent price appreciation. Return volatility, in contrast, is positively related to initial bid premium, bid range,

and the likelihood of downward revisions. Moreover, target firms with more R&D investments receive higher first bid premium, larger price range, and bigger price revision.

Finally, bidders tend to experiment with making a larger number of offers for the target firm if that firm has high Tobin's Q. This evidence is consistent with the notion that buyers learn about the type of assets being sold by making more (or more frequent) offers (Daley and Green, 2012), and such learning is more valuable for firms with higher growth options (i.e., high Tobin's Q) than for firms with a lot of assets in place (i.e., low Tobin's Q).

3.3. Rounds of bidding and offer price bargaining

Figure 4 contains a histogram of the number of bids submitted by the winning bidder during the private M&A deal process. In the majority of deals in our sample, the winning bidder submits between two and four bids over the entire private negotiation period. One of the tails of this distribution is notable: there are 70 deals in our sample which involve only a single bid by the winning bidder (although other bidders may have participated, and the target may have made a counteroffer that the winning bidder did not accept). Some repeat bidders in M&A develop a reputation for only submitting "first, best, and final" offers and refusing to engage in any back-and-forth negotiations with the target firm.[22] In fact, Samuelson (1984)'s bargaining model under asymmetric information in which an uninformed buyer faces an informed seller predicts that the buyer achieves her maximum expected profit when making a first-and-final offer that the seller can either accept or reject. While we do observe these cases in our data (70 of them), they only account for 8% of the full sample.

[22] Warren Buffet (Berkshire Hathaway) is a prominent example of a market participant that has a reputation for submitting "first, best, and final" offers. Such bidders also frequently stipulate that the value of their bid will be reduced or withdrawn if the target firm "shops" the offer to other potential bidders in the hope of receiving a competing bid (Mr. Buffet frequently adopts this strategy).

About 88% of the winning bidders in our sample make 2 - 6 offers during the private negotiation period. The frequent offers made by bidders indicate that sellers routinely reject offers, consistent with screening and signaling models with private information (e.g., Fudenberg, Levine and Tirole, 1985; Grossman and Perry, 1986; Cramton, 1991, 1992). With incomplete information (as in M&A negotiations), a rejection of an offer is likely regarded as a signal, which can be used by the buyer to update the prior about the seller's private information, and thus to adjust subsequent offers (Fudenberg and Tirole, 1983).

Figure 5 plots the different paths of median premiums for 5 groups of winning bidders who make 2, 3, 4, 5, and 6 offers during the private negotiation period, respectively. The patterns in Figure 5 show that final premiums *are remarkably similar regardless of how many offers the bidder makes*. Another way of thinking about this is that, among the five groups depicted in Figure 5, the initial bid premium range is about 4 percent (the highest median initial bid premium is 27.4% among bidders who make two offers, and the lowest median initial bid premium is 23.6% among bidders who make five offers). Despite this initial range, most bidders eventually settle on median final premiums between 35% and 36%. The only exception is observed in bidders who submit two offers, where the final median premium is slightly lower, at 33.5%. This result is consistent with the prediction in Daley and Green (2020) that a buyer's ability to negotiate by making frequent offers does not enable them to extract more surplus from the seller.

In unreported results, we find that unlike bidders, who make frequent offers, 56% of the target firms in our sample do not make any counteroffers (i.e., they reject all bids before accepting the final offer), 27% make only one counteroffer, and 13% make two counteroffers. Only 4% of the target firms make three or more counteroffers. Moreover, in the subsample in which target firms do make counteroffers, they do not counter immediately after receiving the first bid. Rather,

on average, the target firm waits to make their first counteroffer after receiving *two* offers from the winning bidder, consistent with Figure 1 in which we observe a median delay of 26 days between the first offer from the winning bidder and the first counteroffer. This result is consistent with the prediction that an informed bargainer signals the strength of his bargaining position through the willingness to delay settlement (Admati and Perry, 1987; Cramton, 1991, 1992).

After target firms make counteroffers, how is the final negotiated price reached? Figure 6 displays how price negotiations end for the 373 deals with at least one target counteroffer. We use the difference between the first counteroffer and the last bidder offer before that counteroffer to measure the offer price difference between the target firm and the bidder. Figure 6 shows that the bidder declines the counteroffer (and does not improve their offered price following the counteroffer) only 8% of the time. The bidder immediately accepts the target's counteroffer and increases their offered price to match around 27% of the time, potentially to avoid delays.

Notably, more than half of the time (65%), the final negotiated price is in between the last price offered by the bidder and the target's counteroffer. Appendix B.4 provides an example of this "splitting the difference." The merger document (from which the example in Appendix B.4 is drawn) states, "*…the Special Committee (of the target firm) directed representatives from Duff & Phelps to communicate a counterproposal at $8.25 per share, which the Special Committee noted was halfway between the initial offer of $7.75 per share and the Special Committee's initial counterproposal of $8.75 per share.*"

Backus et al. (2020) report a similar splitting the difference pattern in eBay's Best Offer platform. Those authors conclude that although this finding is at odds with existing theory, it is consistent with behavioral norms and the behavioral bargaining literature, which emphasizes reciprocity and fairness (e.g., Veugelers and Kesteloot, 1996; Dasgupta and Tao, 1998; Charness

and Rabin, 2002; Hauswald and Hege, 2003; Andreoni and Bernheim, 2009). The striking similarity of the splitting the difference pattern in our setting and in the eBay setting is remarkable: behavioral norms seem to play the same important role when bargaining over a $95 item as they do when bargaining over a $5 billion-dollar acquisition.

3.4. The deal process and final offer premiums

We next explore whether the deal process impacts the final offer premium. Table 9 reports regression results of final offer premiums on sale process, deal, and firm characteristics. Column (1) reports the association between final offer premiums and the deal process. The key independent variables include six different types of the process. The benchmark group (i.e., the omitted group) is one-on-one negotiation throughout the entire process. *Negotiauction to negotiation* is an indicator variable that equals one if a sale process starts as a negotiauction but there is no competing bidder in the final phase of the sale process. *Remain negotiauction* is an indicator variable that equals one if a sale process starts as a negotiauction and there is at least one competing bidder in the final stage. *Failed auction* is an indicator variable that equals one if a sale process starts as an auction but only attracts one bidder (i.e., the winning bidder). *Auction to negotiation* is an indicator variable that equals one if a sale process starts as an auction, and there are two or more bidders submitting offers, but no competing bidder remains in the final stage. *Remain auction* is an indicator variable that equals one if a sale process starts as an auction and there is at least one competing bidder in the last stage. Other aspects of the process include target making a counteroffer, the parties signing an exclusivity agreement, go-shop provisions, and offer negotiation duration.

In column (1), we find that *Remain negotiauction* and *Remain auction* are associated with higher final premiums of 6.9% and 6.5%, respectively. Conversely, *failed auction* is associated

with a lower final premium of 7.5%. After we control for additional deal and industry effect in columns (2) and (3), the coefficients on both *Remain negotiauction* and *Remain auction* become insignificant, while the coefficient on *failed auction* remains significantly negative. Whether target firm making a counteroffer, signing exclusivity agreement, or a go-shop provision does not seem to significantly affect final premiums. The coefficient on *offer negotiation duration* is positive and statistically significant in all three columns, indicating that a longer negotiation duration is associated with higher final offer premiums. Consistent with prior studies, we also find that target firms receive significantly lower final premiums when sold to financial buyers and significantly higher premiums in cash deals (e.g., Huang and Walkling, 1987; Bargeron et al., 2008; Liu, 2020).

3.5. Deal initiation, deal process and final offer premiums

Gorbenko and Malenko (2022) suggest that in a seller-initiated auctions, each bidder is aware that their rivals' valuations are relatively low; otherwise, these rivals would have initiated the auction themselves. This implies that if a target firm initiates an auction but fails to attract a significant number of bidders, the only interested bidder gain considerable bargaining power. This power comes from understanding the target firm's urgency to sell and the low level of competition. Thus, in target initiated failed auctions, bidders can potentially offer even lower premiums.

We test this prediction in Table 10 by separating each of the six deal types outlined in Table 9 into categories of target-initiated and non-target-initiated sale processes. The benchmark group is *non-target-initiated pure negotiation*. Consistent with our expectation, relative to the benchmark group, target-initiated failed auction is associated with a 15.1% lower final premium, even after we control for other firm characteristics, industry and year effects in column (3). We also find that non-target initiated negotiauction that remains competitive in the final stage earns higher premiums (ranging from 6%-9%). The robust evidence of lower premiums in failed auctions,

particularly target-initiated auctions, provides insight into why many target firms avoid conducting full-scale auctions.

4. Conclusions

This paper uses a manually collected dataset containing detailed bid-level observations within large-scale M&A deals. It offers a comprehensive picture of high-stakes negotiations in the takeover market by analyzing 841 deals announced between 2005 and 2019, representing almost $5 trillion in aggregate deal value. We detail the negotiation strategies and bidding dynamics observed during the private sale process. Our work sheds light on the bidding progression and the evolution of pre-public phases, offering guidance for the advancement of future auction theories.

Despite the appealing theoretical preference for auctions where sellers benefit from simultaneous bidder competition (e.g., Bulow and Klemperer, 1996, 2009), our findings reveal that only about 35% of deals involve eight or more buyers at the start of private negotiations. About 28% of deals involve only one bidder throughout the entire process. The remaining 37% involve 2 - 7 bidders at varying stages. Moreover, traditional auction models overlook the bargaining dynamics in the sale process, focusing instead on different auction formats and seller strategies leveraging bidder competition to raise prices. In contrast, bargaining models concentrate on seller-buyer dynamics, typically without considering auction elements like buyer competition.

The M&A market has transformed significantly since the 1990s, departing from conventional theoretical auction or negotiation models. While initial stages often involve multiple competing bidders, the nature of the deal changes as private negotiation proceeds. Only 25% of deals remain multiple bidders at the final stage, while 75% transition to negotiating with a single buyer. Our results suggest that the real-world deal process in M&As is highly fluid, highlighting

the need for theories considering the interconnectedness and adaptability between auctions and negotiations in practical contexts.

We find several robust empirical patterns. Typically, it takes two-to-four months, involving two-to-six offers from winning bidders, to settle on the final price in most deals. Delays in reaching an agreement are related to information asymmetry, valuation uncertainty, and potential alternative options. Interestingly, final premiums are remarkably *unaffected* by the number of negotiation rounds. However, target firms receive substantially lower premiums if they initiate an auction but fail to attract competing bidders. In a subsample involving counteroffers from target firms, it's common for the final price to reflect a midpoint compromise between the target and the bidder, suggesting that behavioral norms play an important role even in extremely high-stakes, multi-billion dollar transaction negotiations.

Our paper contributes to the empirical and theoretical literature by bridging the extensive theoretical negotiation and auction literature to real-world practice. Recent theoretical advancements, notably by Gorbenko and Malenko (2022) and Chen and Wang (2023), have integrated practical elements like deal initiation and protection. Our findings call for further developments in theories that consider the inherent interconnectedness between auctions and negotiations as in the real world.

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Figure 1. The timeline and duration of the merger negotiation process

This figure illustrates the timeline and median dates between major steps during the merger negotiation process. The sample includes 841 deals announced between 2005 and 2019. The reported days above the timeline are measured based on the full sample, and the reported days below the timeline are measured based on the subsamples, if applicable. The median 57 days between deal initiation and the first bid by other bidder is based on 188 deals in which the first bid is not submitted by the winning bidder. The median 72.5 days between the first bid by other bidder and first bid by the winning bidder is based on 188 deals in which the first bid is not submitted by the winning bidder. The median 26 days between the first bid by the winning bidder and the first target counteroffer is based on 373 deals in which target firms make at least 1 counteroffer. The median 19 days between the first target counteroffer and the last target counteroffer is based on 151 deals in which target firms make two or more counteroffers. The median 3 days between the last target counteroffer and the last bid by the winning bidder is based on 373 deals in which target firms make at least 1 counteroffer.

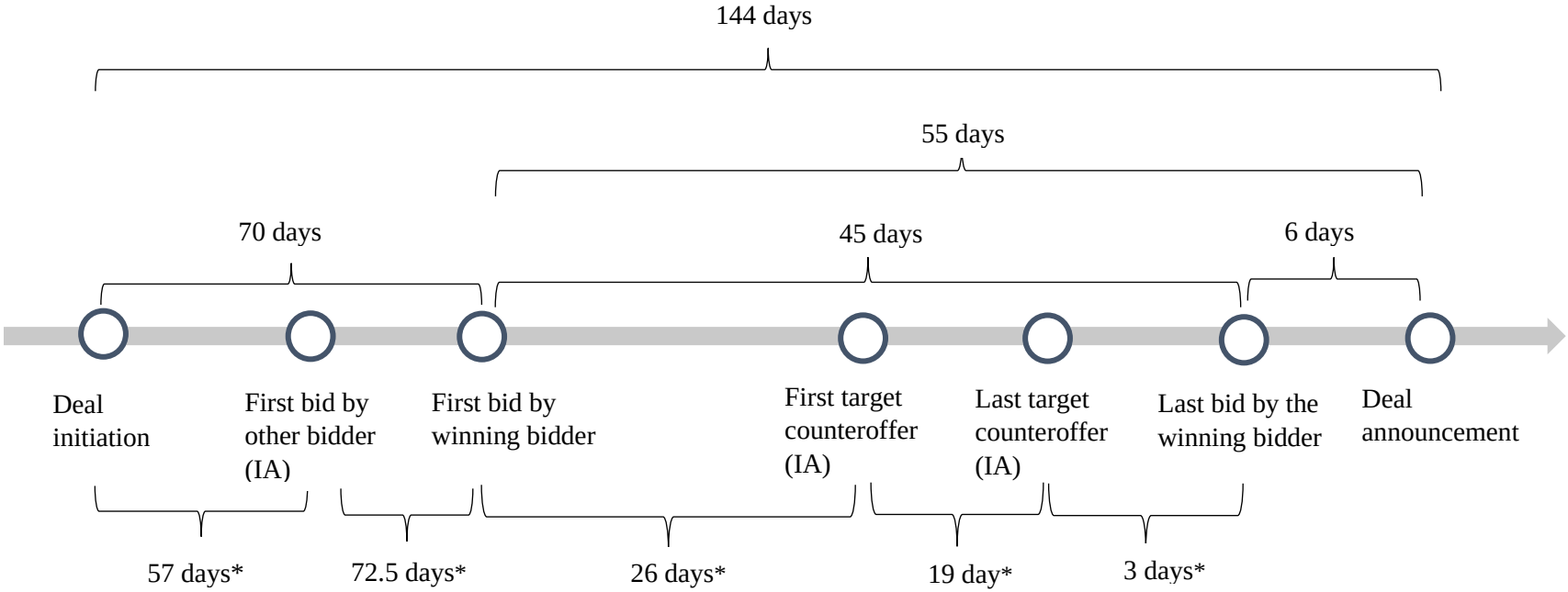

Figure 2. Frequency distribution: Duration of offer price negotiation

This figure plots the frequency distribution of offer price negotiation duration. We define price negotiation duration as the total number of calendar days between the first offer received by the target firm and the date of the merger agreement. The "10 days or less" group includes the number of deals where the duration of offer price negotiation is 10 calendar days or less, the "[11, 20]" group includes the number of deals where the duration of offer price negotiation is between 11 and 20 calendar days, and so on. The sample includes 841 deals announced between 2005 and 2019.

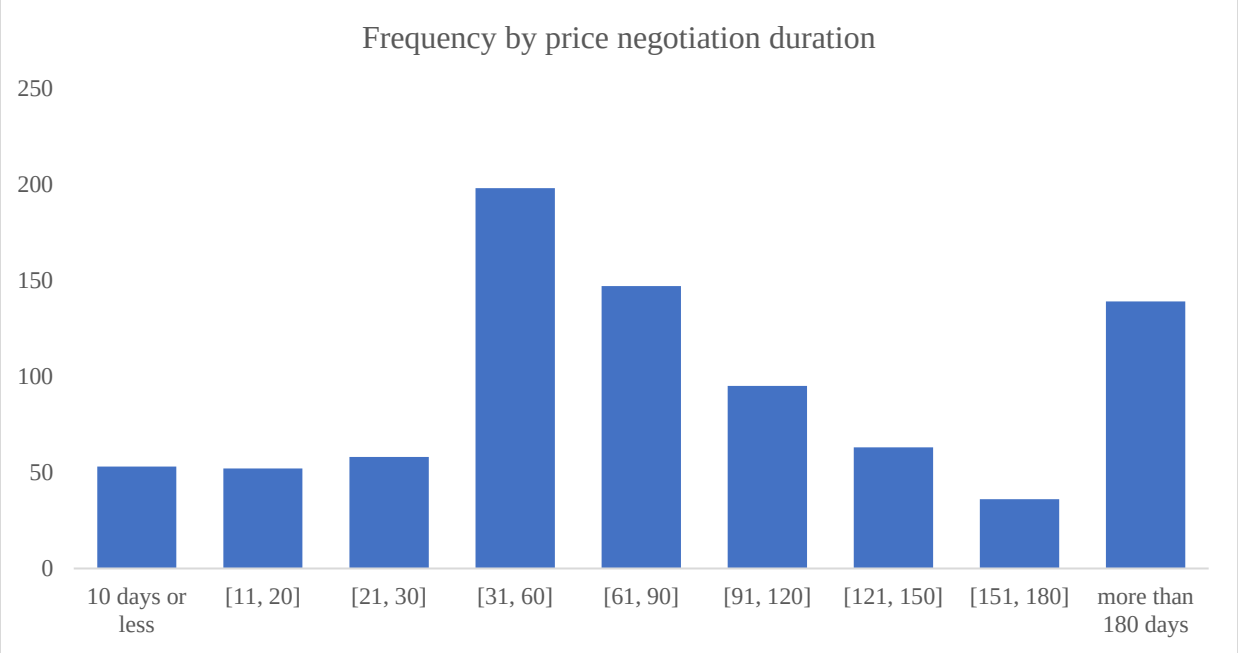

Figure 3. The deal-making process

This figure presents how the deal process evolves from deal initiation to reaching a merger agreement with the final winning bidder. We define "negotiation," "negotiauction," and "auction" based on different stages of the sale process. At the beginning stage, we define the process as an "auction" if 8 or more bidders are contacted (or contact the target firm). We define the process as a "negotiauction" if there are 2 to 7 bidders are contacted (or contact the target firm). We define the process as a "negotiation" if only one bidder is contacted (or contacts the target firm). Finally, during the last negotiation stage, we measure whether there is an active competing bidder, defined as whether a bid is submitted within a month surrounding the last bid submitted by the winning bidder. The sample includes 841 deals announced between 2005 and 2019.

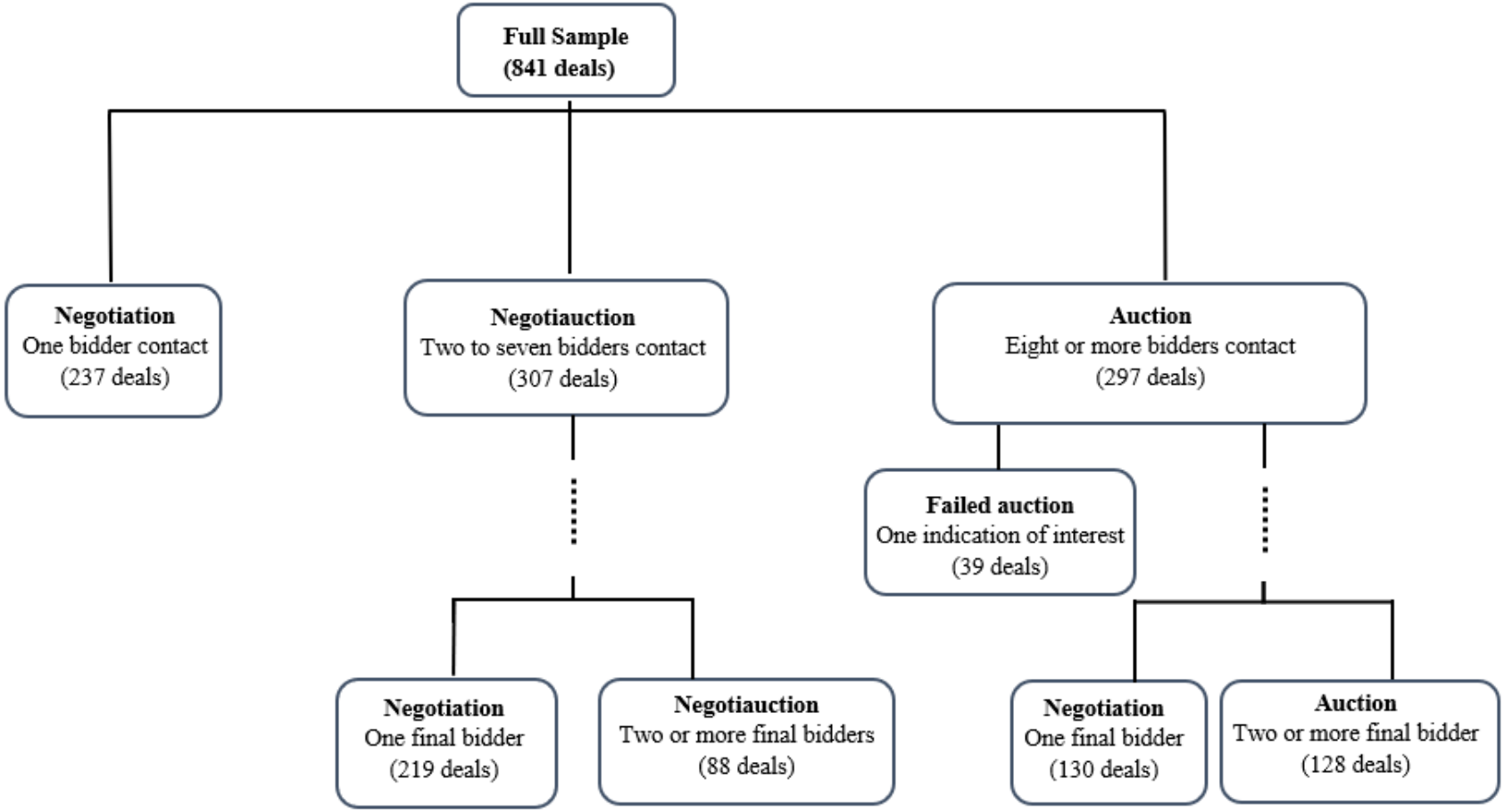

Figure 4. Frequency distribution: Number of offers made by the winning bidder

This figure plots the frequency distribution of number of offers made by winning bidders. We group deals and plot the frequency based on the number of bids submitted during the negotiation process. The "1 bid" group includes the number of deals where the winning bidder only submits one offer before reaching the merger agreement. The "2 bids" group includes the number of deals where the winning bidder submits two offers before reaching the merger agreement. The "3 bids" group includes the number of deals where the winning bidder submits three offers before reaching the merger agreement. The "4 bids" group includes the number of deals where the winning bidder submits four offers before reaching the merger agreement. The "5 bids" group includes the number of deals where the winning bidder submits five offers before reaching the merger agreement. The "6 bids" group includes the number of deals where the winning bidder submits six offers before reaching the merger agreement. The "7 or more bids" group includes the number of deals where the winning bidder submits seven or more offers before reaching the merger agreement. The sample includes 841 deals announced between 2005 and 2019.

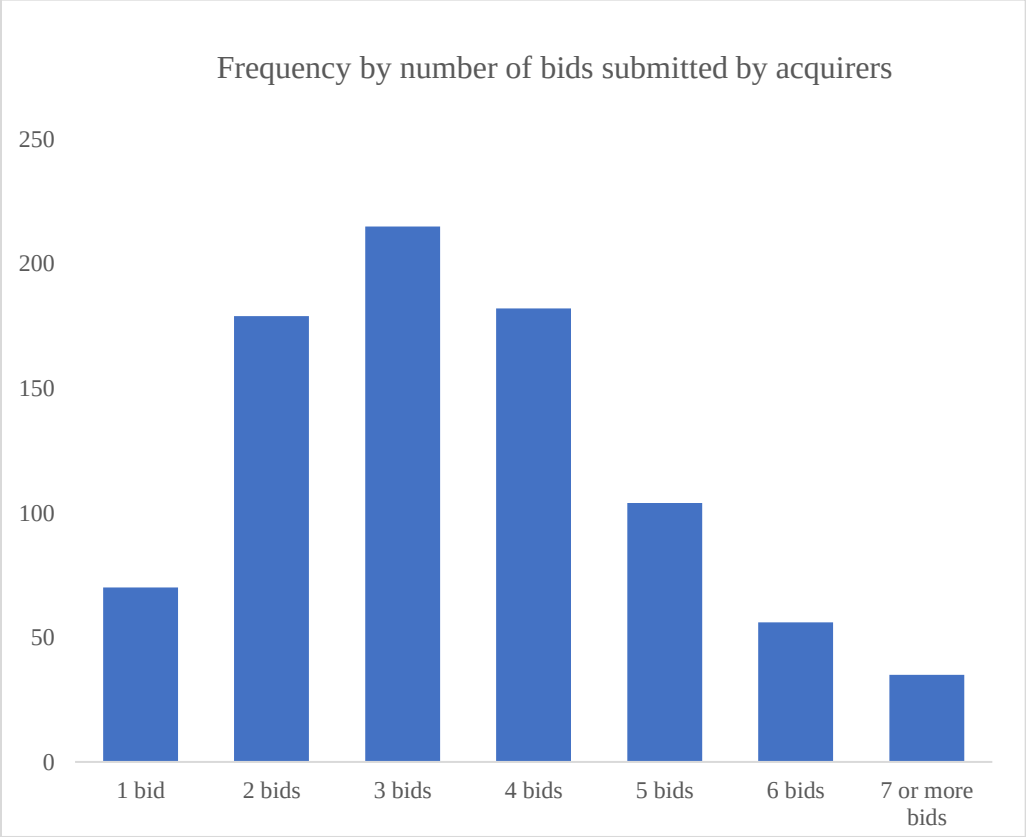

Figure 5. Median offer premiums over the duration of bargaining

This figure displays the median premiums for bidders who make 2 to 6 offers during merger negotiations. We plot the first and the second median premiums for the 179 deals where the winning bidders make two offers. We plot the first, the second, and the third median premiums for the 215 deals where bidders make three offers. We plot the first, the second, the third, and the fourth median premiums for the 182 deals where bidders make four offers. We plot the first, the second, the third, the fourth, and the fifth median premiums for the 104 deals where bidders make five offers. We plot the first, the second, the third, the fourth, the fifth, and the sixth median premiums for the 56 deals where bidders make six offers.

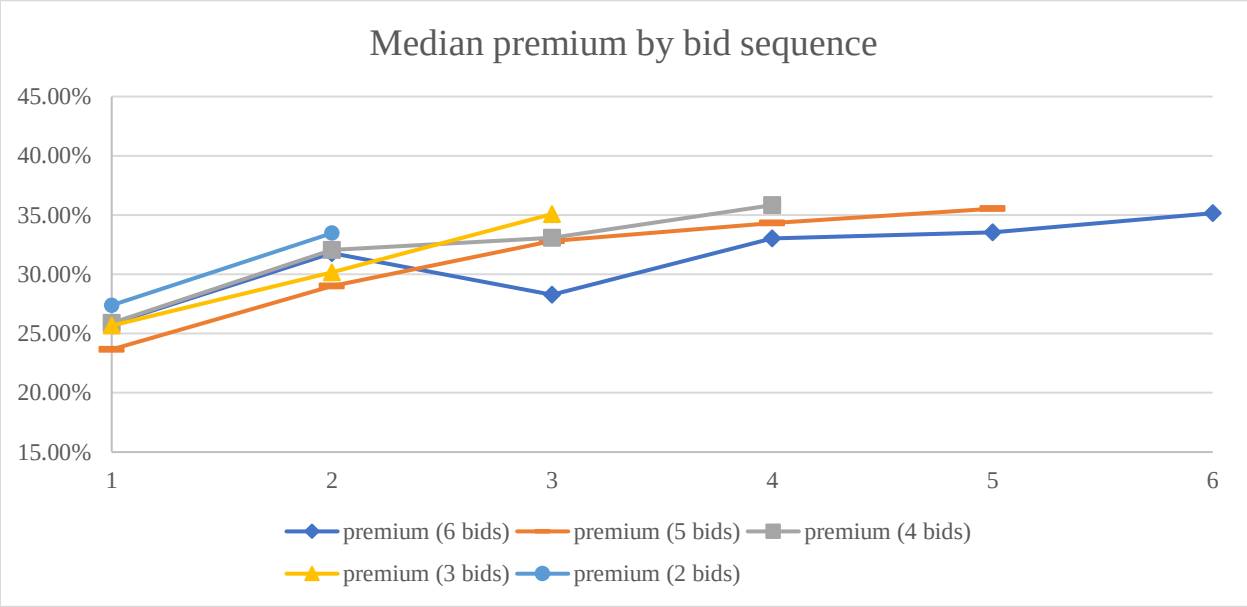

Figure 6. Offer price bargaining between the acquirer and the target firm

This figure displays how the final negotiated price is reached for 373 deals where the target firm makes at least one counteroffer. The "Acquiror declines the counteroffer" group includes 30 deals where the winning bidder does not increase the bid made before the target's counteroffer. The "Acquiror accepts the counteroffer" group includes 99 deals where the winning bidder increases the bid to accept the target's counteroffer. The "Reach agreement somewhere between the bid and counter" group includes 244 deals where the final negotiated price is in between the bid price and the target's counteroffer price.

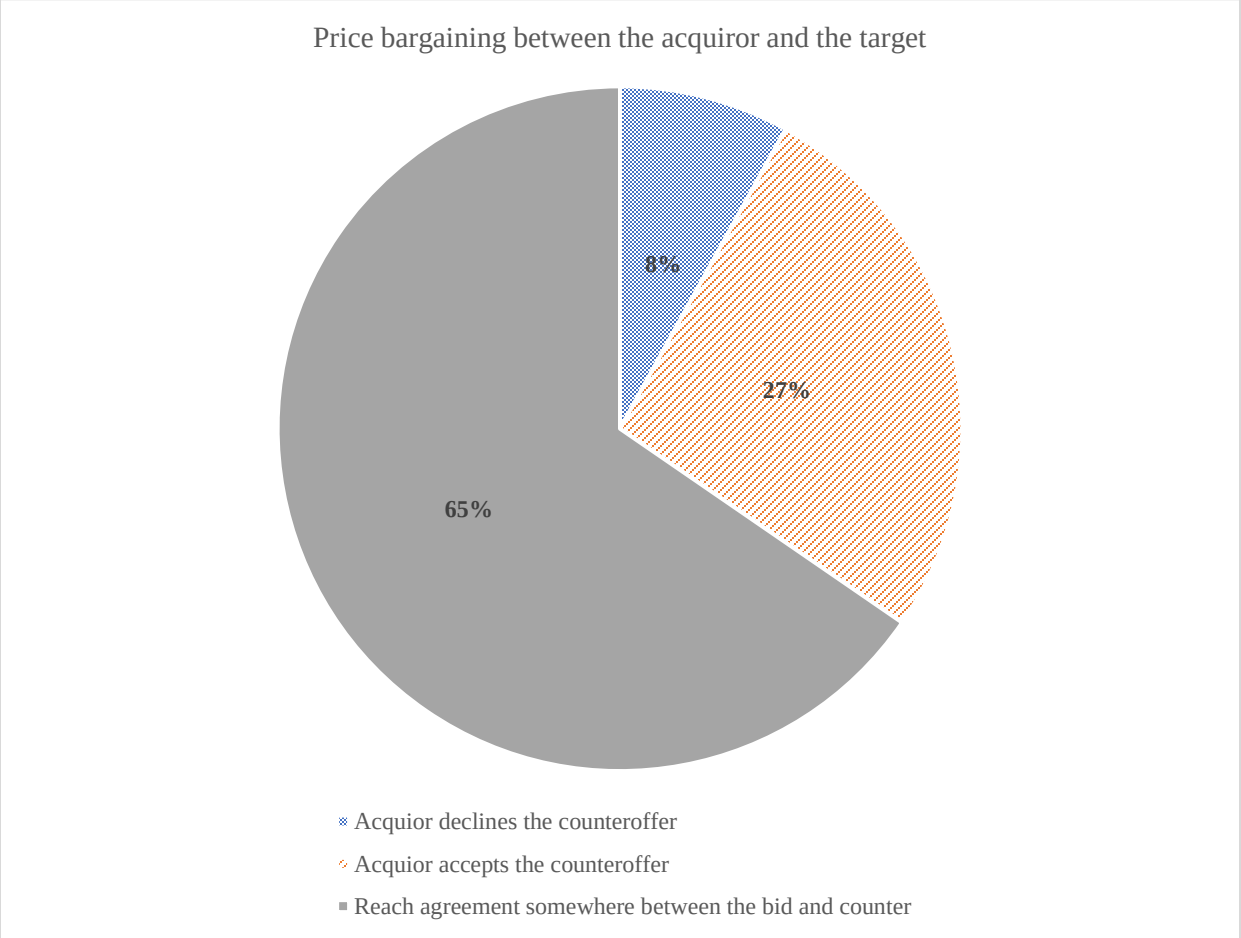

Table 1. Sample distribution and summary statistics

This table presents sample distribution by year and summary statistics. We draw a sample of completed deals from the 2005 to 2019 time period, and we require that the form of the deal is coded as "merger". We require the targets to be public firms and the deal value reported by SDC to be greater than $1 million. We further require that bidders seek to purchase 50% or more of ownership of the target. We restrict target firms to be S&P1500 firms to manage the extensive manual data collection. We merge these SDC data with CRSP to obtain target price data prior to deal initiation. Panel A presents the temporal distribution for the full sample of 841 M&A deals. Percent of deals in each year is calculated using number of deals announced during that year divided by total number of deals over the sample period. Panel B presents the temporal distribution for number of offers and counter offers over the sample period. For each year, we report total number of offers and the average number of offers per deal in that year. Panel C presents summary statistics for deal and firm characteristics. Definitions of all variables are in Appendix A.

Panel A: Sample distribution (deal level)

Year	Number of deals	% deals	% deals initiated by target	% deals initiated by bidders
2005	69	8.20%	40.58%	42.03%
2006	81	9.63%	29.63%	59.26%
2007	93	11.06%	23.66%	65.59%
2008	40	4.76%	35.00%	57.50%
2009	33	3.92%	18.18%	66.67%
2010	54	6.42%	18.52%	77.78%
2011	50	5.95%	16.00%	74.00%
2012	46	5.47%	26.09%	67.39%
2013	40	4.76%	27.50%	65.00%
2014	53	6.30%	20.75%	69.81%
2015	67	7.97%	20.90%	70.15%
2016	65	7.73%	30.77%	58.46%
2017	49	5.83%	26.53%	63.27%
2018	49	5.83%	20.41%	73.47%
2019	52	6.18%	28.85%	53.85%
Total	841	100.00%	25.56%	64.28%

Panel B. Sample distribution (bid level)

Year	Number of offers by any bidder	No. of offers by any bidder per deal	Number of offers by winning bidder	Number of offers by winning bidder per deal	Number of counter offers	Number of counter offers per deal
2005	317	4.59	201	2.91	41	0.59
2006	396	4.89	255	3.15	26	0.32
2007	487	5.24	290	3.12	36	0.39
2008	211	5.28	126	3.15	27	0.68
2009	152	4.61	121	3.67	35	1.06
2010	304	5.63	182	3.37	42	0.78
2011	382	7.64	186	3.72	32	0.64
2012	219	4.76	141	3.07	32	0.70
2013	282	7.05	141	3.53	12	0.30
2014	287	5.42	200	3.77	52	0.98
2015	376	5.61	232	3.46	44	0.66
2016	415	6.38	278	4.28	77	1.18
2017	285	5.82	182	3.71	28	0.57
2018	266	5.43	177	3.61	47	0.96
2019	317	6.10	220	4.23	54	1.04
Total	4,696		2,932		585	

Panel C. Summary statistics

Variable	N	Mean	St.Dev	Median	p25	p75
Deal value	841	5,652.84	10,099.29	2,197.14	955.12	5,260.68
All cash	841	0.59	0.49	1	0	1
Tender offer	841	0.15	0.36	0	0	0
Same industry	841	0.40	0.49	0	0	1
Winning bidder is a public firm	841	0.67	0.47	1	0	1
Winning bidder is a financial buyer	841	0.21	0.40	0	0	0
Toehold	841	0.03	0.16	0	0	0
Target size	841	3,854.74	6,906.47	1,575.96	676.39	3,537.26
Target age	841	22.53	12.82	19	12	32
Past year return	841	0.05	0.34	0.03	-0.15	0.22
Return volatility	841	1.86	0.79	1.76	1.27	2.25
ROA	841	0.04	0.08	0.04	0.01	0.08
Sales growth	841	0.09	0.19	0.06	-0.01	0.16
Leverage	840	0.23	0.20	0.21	0.04	0.37
Q	819	1.78	0.90	1.49	1.15	2.09
R&D	841	0.03	0.06	0	0	0.05
Illiquidity	841	0.58	1.92	0.11	0.03	0.34

Table 2. Descriptive statistics for deal initiation and the sale process

This table presents summary statistics for deal initiation, bidder types, and the sale process. The sample includes 841 deals announced between 2005 and 2019. Panel A reports the portion of deals initiated by the target firm or a potential buyer. Among the subsample with bidder initiation, we further separate winning bidder initiation (i.e., the initiating bidder is the final winning bidder), losing bidder initiation (i.e., the initiating bidder is not the final winning bidder), financial buyer initiation (i.e., the initiating bidder is a financial buyer), and strategic buyer initiation (i.e., the initiating bidder is a strategic buyer). Panel B reports deal initiation and the types of winning bidders. We report within each initiation group (i.e., target initiation, financial buyer initiation, and strategic buyer initiation), the number and percent of deals with the winning bidder type (i.e., financial versus strategic). We also report the number and percent of deals where the initiating bidder is the final winning bidder separately for financial buyer-initiated deals and strategic buyer-initiated deals. Panel C presents summary statistics for the sale process. Definitions of all other variables are in Appendix A.

Panel A. Summary statistics for deal initiation

Variable	N	Mean	St. Dev	Median	p5	p25	p75	p95
Target initiation	841	0.26	0.44	0	0	0	1	1
Bidder initiation	841	0.64	0.48	1	0	0	1	1
Winning bidder initiation	841	0.46	0.50	0	0	0	1	1
Losing bidder initiation	841	0.17	0.38	0	0	0	0	1
Financial buyer initiation	841	0.14	0.35	0	0	0	0	1
Strategic buyer initiation	841	0.49	0.50	0	0	0	1	1

Panel B. Deal initiation and types of winning bidders

Deal initiation	Winning bidder					Initiating bidder wins	Initiating bidder loses
	Financial	%	Strategic	%	Total		
Target	64	39%	154	26%	218		
%	29.4%		70.6%		100%		
Financial buyer	87	54%	33	6%	120	58	62
%	73%		28%		100%	48%	52%
Strategic buyer	11	7%	400	68%	411	333	78
%	3%		97%		100%	81%	19%
Total	162	100%	587	100%			

Panel C. Summary statistics for the deal process

Variable	N	Mean	St. Dev	Median	p5	p25	p75	p95
Number of contact	841	11.42	20.63	4	1	1	12	48
Number of confidentiality agreement	841	5.31	8.76	2	1	1	5	23
Number of bidders submitting bids	841	2.20	2.02	1	1	1	3	6
Number of total bids	841	5.58	4.12	4	1	3	7	14
Number of offers per bidder (any bidder)	841	2.94	1.42	2.86	1	2	4	6
Number of offers winning bidder	841	3.49	1.63	3	1	2	4	6
Financial buyers submitting bids	841	0.32	0.47	0	0	0	1	1
Target counteroffer (dummy)	841	0.44	0.50	0	0	0	1	1
Go-shop provision	841	0.09	0.28	0	0	0	0	1
Exclusivity agreement	841	0.20	0.40	0	0	0	0	1
Early events	841	0.35	0.48	0	0	0	1	1

Table 3. Target firm characteristics and deal initiation

This table reports the marginal effects of probit regressions of target pre-merger firm characteristics on deal initiation. The dependent variable in column (1) is *Target initiation*, which is an indicator variable that equals one if the target firm initiates the sale process, and zero otherwise. The dependent variable in column (2) is *Bidder initiation*, which is an indicator variable that equals one if the target firm is approached by either a strategic buyer or a financial buyer, and zero otherwise. The dependent variable in column (3) is *Strategic buyer initiation*, which is an indicator variable that equals one if the target firm is approached by a strategic buyer, and zero otherwise. The dependent variable in column (4) is *Financial buyer initiation*, which is an indicator variable that equals one if the target firm is approached by a financial buyer, and zero otherwise. All other variables are defined in Appendix A. Robust Z-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Dep. Var.	Target initiation	Bidder initiation	Strategic buyer initiation	Financial buyer initiation
	Probit regression (marginal effects)			
No. potential same industry buyer	0.004**	-0.005**	-0.001	-0.005**
	(2.09)	(-2.27)	(-0.47)	(-2.28)
Target product uniqueness	0.165	0.221	-0.194	0.470**
	(0.64)	(0.78)	(-0.65)	(2.23)
Size	-0.014	-0.008	0.014	-0.024*
	(-0.81)	(-0.43)	(0.70)	(-1.79)
Age	-0.000	-0.001	0.000	-0.001
	(-0.36)	(-0.64)	(0.22)	(-1.41)
Past year return	-0.004	0.003	0.073	-0.087**
	(-0.09)	(0.06)	(1.34)	(-2.03)
Return volatility	0.018	-0.037	-0.022	-0.019
	(0.76)	(-1.42)	(-0.79)	(-1.02)
ROA	-0.634***	0.653***	0.416	0.387**
	(-2.91)	(2.61)	(1.53)	(2.17)
Sales growth	0.140*	-0.218**	-0.124	-0.111
	(1.65)	(-2.36)	(-1.25)	(-1.53)
Leverage	-0.077	0.105	0.039	0.060
	(-0.85)	(1.04)	(0.37)	(0.85)
Q	0.044**	-0.016	-0.007	-0.013
	(2.14)	(-0.67)	(-0.28)	(-0.63)
R&D	-0.741**	0.445	0.509	-0.208
	(-2.10)	(1.14)	(1.24)	(-0.72)
Illiquidity	0.012	-0.006	-0.011	-0.003
	(1.25)	(-0.56)	(-0.93)	(-0.32)
Observations	811	811	811	811

Table 4. Target firm characteristics and the early sale process

This table investigates how target firm characteristics are related to the early stage of the sale process. The dependent variable in column (1) is *number of buyer contact*, which is the number of potential buyers that the target firm was in contact during the negotiation process. Columns (1) reports OLS regression results. Columns (2), (3), and (4) report the marginal effects of ordered probit regressions. Specifically, column (2) reports the probability of negotiation, column (3) reports the probability of negotiauction, and column (4) reports the probability of auction. Robust t/Z-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Dep. Var.	Number of buyer contact	Category contact Negotiation	Category contact Negotiauction	Category contact Auction
	OLS	Ordered Probit (Marginal effect)		
No. potential same industry buyer	0.196	-0.003	-0.000	0.004
	(0.83)	(-1.61)	(-1.38)	(1.62)
Target product uniqueness	23.005**	-0.425**	-0.039	0.464**
	(2.27)	(-1.98)	(-1.55)	(1.99)
Size	-2.607***	0.072***	0.007**	-0.079***
	(-3.22)	(5.39)	(2.07)	(-5.25)
Age	-0.012	0.001	0.000	-0.001
	(-0.21)	(0.81)	(0.76)	(-0.81)
Past year return	-3.194	0.038	0.003	-0.042
	(-1.54)	(0.94)	(0.91)	(-0.94)
Return volatility	-1.385	0.010	0.001	-0.011
	(-1.27)	(0.49)	(0.48)	(-0.49)
ROA	6.418	0.064	0.006	-0.070
	(0.58)	(0.34)	(0.34)	(-0.34)
Sales growth	2.414	-0.097	-0.009	0.106
	(0.64)	(-1.34)	(-1.19)	(1.34)
Leverage	6.199	-0.095	-0.009	0.103
	(1.35)	(-1.24)	(-1.09)	(1.23)
Q	-1.295*	0.013	0.001	-0.015
	(-1.78)	(0.79)	(0.75)	(-0.79)
R&D	8.937	-0.838***	-0.076**	0.914***
	(0.66)	(-3.01)	(-2.00)	(3.05)
Illiquidity	2.408	-0.003	-0.000	0.004
	(1.52)	(-0.40)	(-0.40)	(0.40)
Constant	30.301**			
	(1.97)			
Observations	811	811	811	811
R-squared	0.126			

Table 5. Target firm characteristics, bidder participation, and merger negotiation

This table examines how target characteristics are related to the likelihood of the target firm making a counteroffer, the likelihood of the target firm signing an exclusivity agreement with bidder, the likelihood of having a go-shop provision, and the price negotiation duration. final offer premiums on the sale process, deal, and firm characteristics. The dependent variable in column (1) is *target counteroffer*, which is an indicator variable that equals one if the target firm makes counteroffer(s) during the negotiation process, and zero otherwise. The dependent variable in column (2) is exclusivity agreement, which is an indicator variable that equals one if the target and the winning bidder signed an exclusivity agreement during the negotiation process, and zero otherwise. The dependent variable in column (3) is *go-shop provision*, which is an indicator variable that equals one if the deal has a go-shop provision, and zero otherwise. Columns (1), (2), and (3) use probit regressions with marginal effects reported. All other variables are defined in Appendix A. Robust Z-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
Dep. Var.	Target counteroffer	Exclusivity agreement	Go-shop provision
	Probit regression (marginal effects)		
Category of contact	-0.111***	-0.057***	0.007
	(-5.10)	(-3.25)	(0.54)
No. of potential industry buyer	-0.001	0.004**	-0.000
	(-0.45)	(2.23)	(-0.07)
Target product uniqueness	0.822***	0.385*	0.300*
	(2.90)	(1.69)	(1.75)
Size	0.018	-0.033**	-0.002
	(0.95)	(-2.11)	(-0.16)
Age	-0.003*	-0.002	-0.002*
	(-1.90)	(-1.53)	(-1.86)
Past year return	0.019	0.108***	0.018
	(0.36)	(2.70)	(0.61)
Return volatility	0.044*	-0.036	0.002
	(1.67)	(-1.59)	(0.16)
ROA	0.138	-0.409**	0.061
	(0.53)	(-2.07)	(0.44)
Sales growth	-0.015	0.141*	-0.077
	(-0.15)	(1.83)	(-1.22)
Leverage	0.041	-0.161*	-0.043
	(0.40)	(-1.93)	(-0.70)
Q	0.017	-0.021	-0.004
	(0.71)	(-1.06)	(-0.32)
R&D	0.824**	0.513*	-0.100
	(2.09)	(1.71)	(-0.43)
Illiquidity	-0.007	-0.008	-0.000
	(-0.58)	(-0.87)	(-0.05)
Observations	811	811	811

Table 6. Target firm characteristics, bidder participation, and offer negotiation duration

This table examines how target characteristics are related to offer negotiation duration. The dependent variable is *Days from first bid to merger agreement date*, which is the total number of calendar days between the first offer received by the target firm and the date of the merger agreement. All other variables are defined in Appendix A. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
Dep. Var.	Days from first bid to merger agreement date		
Category of contact	33.515***	29.188***	22.906***
	(7.67)	(6.41)	(5.07)
No. potential same industry buyer	-0.312	-1.147**	-0.662
	(-0.70)	(-2.43)	(-1.36)
Target product uniqueness	2.305***	2.528***	1.645**
	(4.70)	(4.31)	(2.21)
Size		-7.615*	-6.706*
		(-1.89)	(-1.74)
Age		-0.273	-0.301
		(-0.86)	(-0.87)
Past year return		-35.468***	-28.654***
		(-3.70)	(-2.79)
Return volatility		-3.780	-6.497
		(-0.74)	(-1.17)
ROA		-15.207	-0.668
		(-0.29)	(-0.01)
Sales growth		6.683	3.809
		(0.35)	(0.19)
Leverage		-3.972	-4.801
		(-0.20)	(-0.24)
Q		-10.586**	-14.688***
		(-2.53)	(-3.18)
R&D		105.168	61.359
		(1.46)	(0.67)
Illiquidity		0.441	1.266
		(0.15)	(0.42)
Constant	-116.341***	16.223	81.157
	(-2.95)	(0.19)	(0.84)
Industry/Year FE	No	No	Yes
Observations	832	811	811
R-squared	0.087	0.121	0.178

Table 7. Descriptive statistics for offer prices submitted during the negotiation process

This table presents summary statistics for offer prices and price revisions submitted during the price negotiation process. The sample includes 841 deals with 1835 total bidders and 836 winning bidders. *First bid premium* under all bidders is the bid premium of the first bid submitted by any bidder, measured as the difference between bid price and target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date. We use the midpoint if the offer is a price range. *First bid range (dummy)* is an indicator variable that equals one if the first offer contains a price range instead of a specific price, and zero otherwise. *First bid range (if range dummy=1)* is the offer price range scaled by the target firm's pre-initiation stock price for the subsample of deals where the first offer contains a price range. *Bid revision* measures the change in offer price from the previous offer, scaled by the target firm's pre-initiation stock price. *Downward revision dummy* is an indicator variable that equals one if the offer price is lower than the previous offer price. We recalculate all these variables for the winning bidders only under "*Winning bidders only." First bid before CA date dummy* is an indicator variable that equals one if the winning bidder' first bid is submitted before the confidentiality agreement is signed between the winning bidder and the target firm, and zero otherwise. *Target first counter premium* is the premium of the first counter offer by the target firm, measured as the difference between the first counter offer price and the target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date. *Final offer premium* is the bid premium of the final offer price by the winning bidder, measured as the difference between the final offer price and the target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date. More detailed definitions of the variables are in Appendix A.

Variable	N	Mean	St.Dev	Median	p25	p75
All bidders						
First bid premium	1,835	29.35%	25.51%	26.85%	15.40%	40.52%
First bid range (dummy)	1,835	44.85%	49.75%	0	0	1
First bid range (if range dummy=1)	803	14.79%	12.47%	10.44%	6.26%	17.96%
Bid revision	2,841	3.85%	9.36%	2.94%	0.15%	7.21%
Downward revision dummy	2,841	17.32%	37.85%	0	0	0
Winning bidders only						
First bid premium	836	28.60%	24.80%	25.83%	16.50%	38.94%
First bid range (dummy)	836	29.90%	45.81%	0	0	1
First bid range (if range dummy=1)	244	9.85%	7.29%	8.14%	5.19%	12.19%
Bid revision	2,084	3.80%	8.80%	2.78%	0.45%	6.71%
Downward revision dummy	2,084	15.45%	36.15%	0	0	0
Target counter subsample						
Target first counter premium	373	41.99%	30.11%	38.56%	24.83%	54.73%
All deals						
Final offer premium	841	38.22%	30.30%	33.93%	20.46%	51.95%

Table 8. Target firm characteristics and bidders' bidding behavior

This table reports how target firm characteristics are related to bidders' bidding behavior. The sample includes all bidders that submitted at least one bid. The dependent variable in column (1) is *first bid premium*, calculated as the difference between a bidder's first offer price and the target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date. The dependent variable in column (2) is *First bid range (dummy)*, which is an indicator variable that equals one if the first offer contains a price range instead of a specific price, and zero otherwise. The dependent variable in column (3) is *First bid range (if range dummy=1)*, calculated as the offer price range scaled by the target firm's pre-initiation stock price for the subsample of deals where the first offer contains a price range. The dependent variable in column (4) is *Bid revision*, measured as the change in offer price from the previous offer, scaled by the target firm's pre-initiation stock price. The dependent variable in column (5) is *Downward revision dummy*, which is an indicator variable that equals one if the offer price is lower than the previous offer price. The dependent variable in column (6) is *Rounds per bidder*, which is the number of offers submitted by a particular bidder, regardless of whether this bidder is the final winning bidder or not. All other variables are defined in Appendix A. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	First bid premium	First bid range (dummy)	First bid range (if range dummy=1)	Bid revision	Downward revision (dummy)	Rounds per bidder
Size	0.009	-0.035***	-0.019***	-0.001	-0.009	0.039
	(1.49)	(-2.77)	(-4.98)	(-0.60)	(-1.17)	(0.82)
Age	-0.002***	-0.001	-0.001*	0.000**	-0.002**	0.006
	(-2.89)	(-1.00)	(-1.88)	(2.32)	(-2.42)	(1.54)
Past year return	-0.151***	-0.004	-0.048***	-0.001	-0.056**	0.192
	(-6.60)	(-0.10)	(-4.34)	(-0.09)	(-2.35)	(1.42)
Return volatility	0.032**	0.033	0.032***	0.003	0.028**	-0.019
	(2.35)	(1.50)	(4.47)	(0.84)	(2.12)	(-0.24)
ROA	-0.262**	-0.036	0.121*	-0.023	-0.051	0.293
	(-2.23)	(-0.21)	(1.82)	(-0.68)	(-0.47)	(0.48)
Sales growth	0.008	-0.011	-0.013	-0.007	0.053	-0.447*
	(0.22)	(-0.16)	(-0.54)	(-0.57)	(1.03)	(-1.89)
Leverage	0.075**	0.063	-0.020	0.004	0.041	0.055
	(1.97)	(0.82)	(-0.82)	(0.33)	(0.87)	(0.22)
Q	0.003	0.006	-0.035***	-0.001	-0.010	0.142**
	(0.34)	(0.32)	(-5.52)	(-0.49)	(-0.98)	(2.17)
R&D	0.477***	-0.378	0.496***	0.187***	-0.184	0.342
	(3.15)	(-1.14)	(4.60)	(3.66)	(-0.97)	(0.31)
Illiquidity	0.001	-0.004	-0.001	-0.002	0.005	-0.014
	(0.17)	(-0.53)	(-0.30)	(-1.20)	(1.07)	(-0.59)
Constant	0.159	0.587***	0.406***	0.048	0.212*	1.852**
	(1.49)	(2.91)	(6.18)	(1.56)	(1.69)	(2.47)
Industry/Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,790	1,790	788	2,779	2,779	1,803
R-squared	0.156	0.112	0.372	0.037	0.031	0.046

Table 9. The deal process and final offer premiums

This table examines how the sale process, deal, and firm characteristics are related to final offer premiums. The dependent variable is *final offer premium*, measured as the difference between the final offer price and the target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date. We classify the deal process into six different types and use indicator variables to represent each of them. *Negotiauction to negotiation* is an indicator variable that equals one if a sale process starts as a negotiauction but there is no active bidder (expect the winning bidder) in the last negotiation stage. *Remain negotiauction* is an indicator variable that equals one if a sale process starts as a negotiauction and there is at least one active bidder (except the winning bidder) in the last negotiation stage. *Failed auction* is an indicator variable that equals one if a sale process starts as an auction but only the winning bidder submits offers. *Auction to negotiation* is an indicator variable that equals one if a sale process starts as an auction, and there are more than one bidder submitting offers, but there is no competing bidder in the final stage. *Remain auction* is an indicator variable that equals one if a sale process starts as an auction and there is at least one bidder submitting offers and competing with the winning bidder in the last stage. The omitted group in the regression is *pure negotiation* where a sale process starts a negotiation. All other variables are defined in Appendix A. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
Dep. Var.		Final offer premium	
Negotiauction to negotiation	0.026	0.018	0.014
	(0.98)	(0.70)	(0.56)
Remain negotiauction	0.069*	0.051	0.049
	(1.92)	(1.43)	(1.34)
Failed auction	-0.075*	-0.106**	-0.091**
	(-1.77)	(-2.57)	(-2.16)
Auction to negotiation	-0.038	-0.061*	-0.060*
	(-1.11)	(-1.76)	(-1.71)
Remain auction	0.065*	0.040	0.040
	(1.82)	(1.11)	(1.10)
Counteroffer	0.010	0.011	0.006
	(0.46)	(0.54)	(0.30)
Exclusivity agreement	-0.016	-0.039	-0.036
	(-0.64)	(-1.57)	(-1.42)
Go shop	-0.048*	-0.022	-0.026
	(-1.76)	(-0.72)	(-0.87)
Offer negotiation duration	0.043***	0.034***	0.031**
	(3.68)	(2.94)	(2.55)
Size		-0.025**	-0.016*
		(-2.57)	(-1.72)
Financial acquiror		-0.087***	-0.097***
		(-2.80)	(-3.17)
Cash deal		0.086***	0.070***
		(3.75)	(3.04)
Tender offer		0.057*	0.019
		(1.76)	(0.60)
Same industry		0.005	0.005
		(0.23)	(0.23)
Toehold		-0.014	-0.027
		(-0.21)	(-0.40)
Constant	0.191***	0.550***	0.442**
	(4.04)	(3.46)	(2.49)
Industry/Year FE	No	No	Yes
Observations	841	841	841
R-squared	0.039	0.093	0.156

Table 10. Target initiation, the deal process, and final offer premiums

This table examines how target initiation and the sale process are related to final offer premiums. In this table, we further classify each of the sale processes described in the previous table into target-initiated and non-target-initiated based on whether the target firm initiates the sale process. The omitted group is non-target-initiated pure negotiation. All other variables are defined in Appendix A. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
Dep. Var.		Final offer premium	
Target-initiated pure negotiation	0.040	0.061	0.063
	(0.73)	(1.07)	(0.96)
Target-initiated negotiauction to negotiation	-0.003	-0.014	-0.022
	(-0.05)	(-0.28)	(-0.47)
Nontarget-initiated negotiauction to negotiation	0.040	0.034	0.033
	(1.37)	(1.19)	(1.17)
Target-initiated remain negotiauction	-0.016	-0.022	0.012
	(-0.18)	(-0.25)	(0.12)
Nontarget-initiated remain negotiauction	0.092**	0.073*	0.063*
	(2.46)	(1.96)	(1.67)
Target-initiated failed auction	-0.171***	-0.190***	-0.151***
	(-3.57)	(-3.77)	(-2.91)
Nontarget-initiated failed auction	0.016	-0.026	-0.027
	(0.27)	(-0.47)	(-0.47)
Target-initiated auction to negotiation	-0.054	-0.095*	-0.090*
	(-1.06)	(-1.86)	(-1.69)
Nontarget-initiated auction to negotiation	-0.018	-0.029	-0.028
	(-0.44)	(-0.70)	(-0.71)
Target-initiated remain auction	0.075	0.047	0.054
	(1.36)	(0.87)	(0.98)
Nontarget-initiated remain auction	0.063	0.037	0.035
	(1.60)	(0.93)	(0.91)
Counteroffer	0.009	0.010	0.005
	(0.41)	(0.49)	(0.24)
Exclusivity agreement	-0.015	-0.040	-0.037
	(-0.60)	(-1.59)	(-1.47)
Go shop	-0.045*	-0.023	-0.027
	(-1.68)	(-0.78)	(-0.90)
Offer negotiation duration	0.040***	0.030**	0.027**
	(3.32)	(2.50)	(2.16)
Size		-0.026***	-0.017*
		(-2.71)	(-1.82)

Financial acquiror		-0.080**	-0.091***
		(-2.55)	(-2.90)
Cash deal		0.087***	0.072***
		(3.81)	(3.11)
Tender offer		0.058*	0.023
		(1.79)	(0.71)
Same industry		0.003	0.004
		(0.15)	(0.17)
Toehold		-0.022	-0.034
		(-0.35)	(-0.49)
Constant	0.199***	0.582***	0.472***
	(4.08)	(3.59)	(2.61)
Industry/Year FE	No	No	Yes
Observations	841	841	841
R-squared	0.047	0.101	0.162

Appendix A. Variable definitions

Variable	Definition	Data Source
A.1. Sale process variables		
Target initiation	An indicator variable that equals one if the target firm initiates the sale process, and zero otherwise.	Merger documents
Bidder initiation	An indicator variable that equals one if a bidder initiates the sale process, and zero otherwise.	Merger documents
Financial buyer initiation	An indicator variable that equals one if a financial buyer initiates the sale process, and zero otherwise.	Merger documents
Strategic buyer initiation	An indicator variable that equals one if a strategic buyer initiates the sale process, and zero otherwise.	Merger documents
Number of contact	The number of potential buyers that the target firm was in contact during the negotiation process.	Merger documents
Number of confidentiality agreement	The number of potential buyers that signed a confidentiality/standstill agreement with the target firm.	Merger documents
Number of bidders submitting bids	The number of potential buyers that submitted a written proposal with a price range proposed to buy target shares.	Merger documents
Negotiation	An indicator variable that equals one if only one bidder is contacted (or contacts the target firm), and zero otherwise.	Merger documents
Auction	An indicator variable that equals one if 8 or more bidders are contacted (or contact the target firm), and zero otherwise.	Merger documents
Negotiauction	An indicator variable that equals one if there are 2 to 7 bidders are contacted (or contact the target firm), and zero otherwise.	Merger documents
Number of offers per bidder (any bidder)	The number of offers submitted by a particular bidder, regardless of whether this bidder is the final winning bidder or not.	Merger documents
Number of offers per winning bidder	The number of offers submitted by the final winning bidder.	Merger documents
Financial buyers submitting bids (dummy)	An indicator variable that equals one if there is a financial buyer who submits at least one offer during the process, and zero otherwise.	Merger documents
Target counteroffer (dummy)	An indicator variable that equals one if the target firm makes counteroffer(s) during the negotiation process, and zero otherwise.	Merger documents
Go-shop provision	An indicator variable that equals one if the deal has a go-shop provision, and zero otherwise.	Merger documents
Exclusivity agreement	An indicator variable that equals one if the target and the winning bidder signed an exclusivity agreement during the negotiation process, and zero otherwise.	Merger documents
Early events	An indicator variable that equals one if there is takeover speculation (i.e., news article, 13D filing,	Merger documents

	and market rumor etc.) prior to the deal announcement, and zero otherwise.	
Offer negotiation duration	The natural logarithm of the total number of calendar days between the first offer received by the target firm and the date of the merger agreement.	Merger documents
A.2. Premium variables		
First bid premium	Bid premium of the first bid submitted, calculated as the difference between bid price and target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date.	CRSP, merger documents
First bid range (dummy)	An indicator variable that equals one if the first offer contains a price range instead of a specific price, and zero otherwise.	Merger documents
First bid range (if range dummy=1)	The offer price range scaled by the target firm's pre-initiation stock price for the subsample of deals where the first offer contains a price range.	CRSP, merger documents
Bid revision	The change in bid price from the previous bid price, calculated as the difference in bid price between the current and the previous bid, scaled by the stock price at day -1 relative to the deal initiate date.	CRSP, merger documents
Downward revision dummy	An indicator variable that equals one if the current bid price is less than the previous bid price, and zero otherwise.	Merger documents
First bid before CA date dummy (winning bidder)	An indicator variable that equals one if the winning bidder' first bid is submitted before the confidentiality agreement is signed between the winning bidder and the target firm, and zero otherwise.	Merger documents
Target first counter premium	The premium of the first counteroffer by the target firm, measured as the difference between the first counteroffer price and the target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date.	CRSP, merger documents
Final offer premium	Bid premium of the final offer price by the winning bidder, measured as the difference between the final offer price and the target stock price at day -1 relative to the deal initiate date, scaled by the stock price at day -1 relative to the deal initiate date.	CRSP, merger documents
A.3. Deal/firm characteristics		
Size	Target firm's most recent month-end market capitalization prior to the deal initiate date.	CRSP
Age	The time in years since the first date of the target firm's total assets data in Compustat.	Compustat
Past year return	Buy-and-hold stock return from month -12 to month -1 relative to the deal initiate month.	CRSP

Return volatility	Idiosyncratic volatility, calculated as the standard deviation of residual returns from regressing daily excess stock returns onto contemporaneous Fama-French three factors. The regression is performed using daily returns over 252 days prior to the deal initiate date.	CRSP
ROA	Net income, scaled by total assets.	Compustat
Sales growth	Growth rate of sales.	Compustat
Leverage	Book value of debt divided by the book value of assets.	Compustat
Q	Tobin's Q, defined as the ratio between the market value of the firm over the replacement cost of its assets.	Compustat
R&D	R&D expenditures, scaled by total assets.	Compustat
Illiquidity	Amihud's illiquidity ratio over 252 days prior to the deal initiate date.	CRSP
No. of potential industry buyer	The number of firms that have the same two-digit SIC code but with a larger market capitalization than the target firm measured at the most recent month-end prior to the deal initiate date.	CRSP
Target product uniqueness	One minus the average of the product similarity scores between the target firm and each of its ten closest rivals. The closest rivals are the ten firms having the highest product similarity scores with the target firm.	Hoberg and Phillips (2010)
Deal value	Value of the deal, measured in millions.	SDC
All cash	An indicator variable that equals 1 if the method of payment is cash only, and zero otherwise.	SDC
Tender offer	An indicator variable that equals 1 if the deal is a tender offer, and zero otherwise.	SDC
Same industry	An indicator variable that equals one if the acquirer and the target share the same three-digit Standard Industrial Classification Code (SIC), and zero otherwise.	SDC
Financial acquirer	An indicator variable that equals 1 if the acquirer is a financial buyer, and zero otherwise.	Merger documents
Public acquirer	An indicator variable that equals 1 if the acquirer's public status is 'Public', and zero otherwise.	SDC
Toehold	An indicator variable that equals 1 if the acquirer has an ownership stake of 5% or more in the target, and zero otherwise.	SDC

Appendix B. Our data collection process

B.1. Data sources

We obtain merger documents from the Securities and Exchange Commission's (SEC's) EDGAR website. The SEC requires that firms publicly listed on US stock exchanges disclose all material information when they issue proxy statements soliciting shareholder votes. Since almost all mergers require a shareholder vote from target shareholders, we are able to collect the relevant information for our analysis. For tender offers (where the target shareholders do not vote), the target firm is still required to file form SC14D9 and to make a recommendation statement to their shareholders with respect to the tender offer, which is pursuant to Section 14(d)(4) of the 1934 Securities Exchange Act.

SEC filings we use to obtain the detailed information on price revisions and the sale process include S-4, S-4/A, DEFM 14, DEFM 14/A, SC14D9, DEF 14A, DEFS 14A, PRES14A, SC 13E3, and PRER14A. Most of the time, detailed information on private negotiation is available in the section titled "Background of the Merger." Occasionally, it also appears in the section titled "Board Deliberations."

B.2. Variables collected

To capture the detailed negotiation process and the dynamics of offer price negotiation, we manually collect the following information from merger documents at the *deal* level: (1) the date on which the deal was initiated, (2) the party who initiated the deal, (3) whether the initiating bidder is a financial or strategic buyer, (4) the number of participants in contact with the target firm during the private sales process, (5) the number of participants who signed a confidentiality agreement with the target firm, (6) the number of indications of interest submitted, (7) any pre-event activities of 13d filings and merger rumors prior to the public merger announcement, (8) the target and the winning bidder signed an exclusivity agreement during the negotiation process, (9) whether a go-shop provision is included in the merger agreement.

At the *bidder/offer* level, we collect the following: (1) all bids submitted by all potential bidders, including bidders that did not win the competition. Sometimes, a proposal contains a price range instead of a specific number. In those cases, we record the low and high of the price range. (2) Whenever possible, we identify weather each potential bidder is a financial buyer or strategic buyer. (3) We collect the dates each bid is submitted. If a target makes a counteroffer, we collect (4) the counteroffer price and (5) the date of the counteroffer.

B.3. An illustration of collecting deal initiation and initiation dates

For each transaction, we obtain detailed information on deal initiation and the initiation date from the Background section of merger documents. The specifics of deal initiation and initiation dates follow Eaton, Liu and Officer (2021).[1]

A deal is classified as "target initiation" if the sale process is initiated by the target firm. A deal is classified as "bidder initiation" if the target is approached by a potential bidder, regardless if the initiating bidder is the final winning bidder. These two types of initiation account for 90% of all deals in our sample. The rest 10% include "mutually initiation", "major target shareholder initiation", and "investment bank initiation."

B.4. An illustration of collecting bids and bid dates

[1] See their Internet Appendix IA.1 for examples and more details on deal initiation and initiation dates.

The background section of the merger document discloses the dates and indicated offer price or price range to purchase the target firm. For example, in the merger between Calamos Asset Management Inc (the target) and Calamos Partners LLC (the acquirer), the Background section state the following (simplified):[2]

- On the evening of November 22, 2016, the Special Committee received a letter from Mr. Calamos on behalf of the Purchaser Group proposing an acquisition by the Purchaser Group of all Shares not already owned by them for $7.75 per share.
- On December 6, 2016, the Special Committee held a telephonic meeting…Following discussion, the Special Committee made a preliminary determination to counter the Purchaser Group's initial proposal with a proposal of $8.75 per Share.
- On December 7, 2016, representatives of BofA Merrill Lynch, on behalf of the Purchaser Group, conveyed to representatives of Duff & Phelps a counterproposal of $8.00 per share.
- On December 12, 2016 the Special Committee held a telephonic meeting at which all members of the Special Committee and representatives of Morris Nichols and Duff & Phelps were present and at which the Purchaser Group's $8.00 per share counterproposal was discussed…Following discussion, the Special Committee directed Duff & Phelps to communicate a counterproposal of $8.35 per share.
- On December 15, 2016, the Purchaser Group, acting through BofA Merrill Lynch, communicated to representatives of Duff & Phelps a revised proposal of $8.13 per share.
- On December 16, 2016, the Special Committee held a telephonic meeting at which all members of the Special Committee and representatives of Duff & Phelps attended. During this meeting, the Special Committee discussed the $8.13 proposal…Following this discussion, the Special Committee directed representatives from Duff & Phelps to communicate a counterproposal at $8.25 per share, which the Special Committee noted was half way between the initial offer of $7.75 per share and the Special Committee's initial counterproposal of $8.75 per share.
- Later in the evening of December 16, 2016, the Purchaser Group made an additional counterproposal of $8.20 per share.
- On the morning of December 18, 2016, representatives of Kramer Levin and representatives of Morris Nichols discussed several items…These negotiations resulted an increase in the offer price to $8.25 per share.

B.5. An illustration of identifying financial versus strategic buyers

The background section only refers the name of the bidder if later the deal is announced and the identity of the bidder is publicly disclosed. For other bidders who do not win the takeover competition, the merger document usually refers them as "Company A," "Party A," "Bidder A", "Partner A", "Firm A", or "Sponsor A". Although we do not know the identity of the losing bidders, we are able to identify their types in most cases.

For example, in the acquisition of TIBCO Software Inc, the merger document states the following:[3]

> "During the weeks of August 4, 2014, and August 11, 2014, each of the four financial sponsors held a meeting with TIBCO management so that each financial sponsor could gain a better understanding of TIBCO and its strategy. Each of the financial sponsors was subsequently asked to provide a preliminary indication of its interest in an acquisition of TIBCO by August 15, 2014. The third financial sponsor, which we refer to as "Sponsor A," provided a preliminary, non-binding

[2] The full merger document is available at https://www.sec.gov/Archives/edgar/data/1299033/000119312517013269/d306918dsc14d9.htm

[3] The full merger document is available at https://www.sec.gov/Archives/edgar/data/1085280/000119312514385947/d802367ddefm14a.htm

> indication of interest in pursuing an acquisition of TIBCO for a value of between $20.00 and $21.00 per share, and also indicated its interest in making a capital injection. The fourth financial sponsor, which we refer to as "Sponsor B," provided a preliminary, non-binding indication of interest in pursuing an acquisition of TIBCO for a value of between $24.00 and $25.00 per share."

In this example, we are able to collect bid ranges of both "Sponsor A" and "Sponsor B" and identify both of them as financial buyers.

Below we provide another example that involves strategic buyers submitting bids to buy Pepco Holdings Inc. The merger document states the following: [4]

> The Board directed management and its advisors to contact six additional potential strategic counterparties from the list that had been identified by Lazard and discussed with the Board (in addition to Exelon and Bidder A), each of which was a utility holding company, enter into non-disclosure agreements with each of those eight potential counterparties that were interested in doing so (referred to as the counterparties).
>
> On March 27, 2014, PHI received indications of interest from Bidder D, who provided for an acquisition of PHI in an all cash transaction for $26.00 per share.

In this example, we record "Bidder D" as a strategic buyer with a bid price of "$26" submitted on "03/27/2014".

[4] Full merger document is available at https://www.sec.gov/Archives/edgar/data/1135971/000157104914003924/t1401350-defm14a.htm