

Are bidder-initiated takeovers opportunistic?*

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Abstract

Statistically, bidders initiate the deal process to acquire a US public target only in about half of the time, with the other half initiated by the target itself. By accounting for this endogenous initiation choice, we substantially increase power to test whether bidders time the deal initiation to opportunistically pay for the target with overpriced shares, possibly crowding out more efficient potential buyers. Our alternative hypothesis is that bidders use shares as acquisition currency to hedge against target adverse selection (provided the target does not substantially undervalue those shares). Inconsistent with bidder opportunism, and regardless of who initiates the deal, bidders are more (not less) likely to use stock as deal payment for targets that are more (not less) precisely informed about bidder true value. Moreover, structural estimation shows that opportunistic bidders crowd out high-synergy rivals in only 6% of transactions—whether the target or the bidder initiates the deal. Finally, conditional on bidder initiation, firm- and sector-specific market valuations further suggest that the typical deal process is sufficiently informative for targets to unravel bidder opportunism in stock-financed takeovers.

JEL classifications: G3, G34

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“[The AOL TimeWarner deal] was done on terms that were insane ... AOL stock was ridiculously overvalued ... [AOL’s CEO Steve Case] chose the moment, almost to the day, when his stock was most valuable and then used it as currency.”

—Geoffrey Colvin, *Fortune*, February 3, 2003.¹

1 Introduction

In principle, a potential acquirer may use private information to initiate the deal process and offer to pay for the target with temporarily overpriced shares. Analogous to insider trading in secondary equity markets, and irrespective of how the subsequent deal process plays out, self-selecting the timing of the deal increases the chance of succeeding with this opportunistic bidding strategy. Successful bidder opportunism raises a social welfare concern since the most overvalued rather than the most efficient bidder may win in the competition for the target. If unsuccessful, opportunistic bidders may still cause a wealth transfer by driving up the winner’s price in second-price auctions. Also, undervalued and financially constrained firms may avoid altogether entering a costly bidding contest for the target, despite having high synergies. All of these information-based effects have the potential for distorting the important disciplinary role of what Manne (1965) labels the market for corporate control.

In this paper, we perform an empirical analysis with unprecedented power to identify whether bidder opportunism is important in takeovers. Our incremental test-power comes from conditioning the analysis on whether the bidder was in fact the party that initiated the takeover process. Recognition of the importance of endogenous trade-initiation decisions in markets with asymmetric information goes back to the seminal work of Akerlof (1970) on adverse selection in markets where used cars (“lemons”) are exchanged for cash. Adverse selection as a basic economic primitive since influenced analyses of deal initiations in studies of anonymous insider trades (beginning with Jaffe, 1974), seasoned equity offerings (Myers and Majluf, 1984), dealer markets (Glosten and Milgrom, 1985), and in negotiated takeovers settings where the bidder pays for the target with its own shares, effectively swapping “lemons” (Hansen, 1987; Fishman, 1989; Eckbo, Giammarino, and Heinkel, 1990a).

Shleifer and Vishny (2003) brought early attention to the potential for bidder opportunism in takeovers

¹In January 2000, AOL announced a stock-swap merger for Time Warner valued at \$165 billion, the largest merger in U.S. history at the time. Three months later, in March of 2000, the stock market “technology bubble” burst and lowered the market value of AOL-TimeWarner by more than \$100 billion. Shleifer and Vishny (2003) also characterizes the AOL takeover bid as opportunistic: “[T]he central feature of [the AOL TimeWarner] acquisition is not technological synergies, but rather the attempt by the management of the overvalued AOL to buy the hard assets of Time Warner to avoid even worse returns in the long run.” (p. 308).

by suggesting that agency frictions on the target side of the deal may allow bidder opportunism to succeed: target managers may find it in their personal interest to knowingly accept overpriced bidder shares. Empirical research has examined one such potential agency channel—the incentive effect of the fact that a takeover causes immediate vesting of the target management’s unvested compensation—without finding supporting evidence (Fidrmuc and Xia, 2019; Eckbo, Norli, and Thorburn, 2023; Barger and Denis, 2025). While agency frictions remain an interesting avenue in the context of opportunism, we instead focus in this paper on a more primitive and pervasive friction in takeover transactions: Information asymmetries between the transacting parties that remain unresolved throughout the deal completion process.

The type of informational friction that motivate the empirical approach of this paper also highlight a major empirical inference problem in all tests of bidder opportunism. While opportunism presumes bidder mispricing, the major alternative hypothesis does not: bidders prefer payment in shares to hedge against adverse selection by the target. This hedge-property reflects that value of a stock-financed offer to the target depends on the ex-post realized value of the merged firm, which payment in cash does not. The unique contingent-value property means that some rational but low-value targets will reject a stock offer that they otherwise would have accepted if paid in cash. It is only when the target substantially undervalues the bidder shares that the bidder will optimally substitute cash for stock in the deal payment.²

A main contribution of this paper is to integrate existing theory on bidder adverse selection with the bidder incentive to use its private information to use its temporarily overpriced shares to the target. In settings with two-sided adverse selection, which we describe in more detail in Section 3 below, bidder opportunism is best understood as rational side-bets on otherwise valuable (synergistic) takeover opportunities.³ Unlike equilibrium models where the payment method fully reveals the bidder’s true value (Eckbo, Giammarino, and Heinkel, 1990a; Liu and Bernhardt, 2021), the bet is that the target will remain sufficiently confused about this value throughout the deal process to (accidentally) accept overpriced bidder shares (Rhodes-Kropf and Viswanathan, 2004; Li, Taylor, and Wang, 2018). This raises the main challenge that we address: How to empirically identify whether a bidder uses stock-financing

²This intuition began with the theoretical developments of Hansen (1985, 1987), Fishman (1989), Eckbo, Giammarino, and Heinkel (1990a), and Berkovitch and Narayanan (1990). It also plays an important role in more recent takeover models such as Rhodes-Kropf and Viswanathan (2004), DeMarzo, Kremer, and Skrzypacz (2005), Gorbenko and Malenko (2014), Gorbenko and Malenko (2018), Liu and Bernhardt (2021). See also Dasgupta and Hansen (2007), Skrzypacz (2013), and Eckbo, Malenko, and Thorburn (2025) for reviews.

³Positive deal synergies rule out stock-swaps as pure zero-sum games, which violate the classical no-trade theorem in economics (Milgrom and Stokey, 1982).

opportunistically, to hedge against target adverse selection, or as a combination of the two alternatives.

In general, beyond the deal parameters that are observable to the target, the likelihood that a bidder will succeed in paying for the target with overpriced shares also depends on the target-specific skill in reverse-engineering the overvaluation. As in Eckbo, Makaew, and Thorburn (2018), a major determinant for this skill is to what extent the two firms operate in related product and labor markets. They find that the likelihood of observing bidder stock in the deal payment *increases* rather than decreases with this and other information proxies. Kim, Luu, and Xu (2025) reach a similar conclusions after introducing institutional ownership concentration in the target firm as an additional information channel. Since it is more difficult to sell overpriced bidder shares to relatively precisely informed targets, this evidence contradicts bidder opportunism as a major rationale for the stock-financed bids.

Li, Taylor, and Wang (2018) take a different approach to the empirical challenge of identifying bidder opportunism. They develop and structurally estimate the likelihood of opportunistic outcomes in a takeover model where the stock-financed bids (in equilibrium) leave the target with a positive chance of accepting overpriced shares. This risk exists because observable deal parameters are insufficient for the target to infer the true bidder value. As a result, an opportunistic low-synergy bidder may crowd out a more efficient (higher-synergy) rival. As their structural estimation produces inefficient outcomes in only 7% of their sample of takeovers, they conclude that “synergies swamp misvaluation” (p.267).

Our main contribution to the above debate is to explicitly condition tests of bidder opportunism on whether the bidder or the target initiates the deal. Endogenous self-selection necessarily implies increases the a bidder-initiated and stock-financed deal has a greater likelihood of containing overpriced bidder shares than does a target-initiated deal. It also increases test power relative the extant empirical literature that up to this point has essentially treated the initiation decision as a random assignment. With Gorbenko and Malenko (2024), the theoretical literature on takeovers has also just started to endogenize the initiation decision (without also considering opportunism). Hence, by conditioning on the party that self-selects to initiate the trade, our empirical analysis helps to fill an important void in our economic understanding of the takeover process.

We analyze 2,968 acquisitions of public US-domiciled targets from 2000 through 2020, all sorted by deal initiation. As explained further in Section 2, public targets file extensive information on the background of the merger with the Securities and Exchange Commission (SEC). Manual reading of this background information in most cases identifies the initiating party to the deal. Our sample is the

hitherto largest sample in the growing literature documenting takeover initiations,⁴ and it is the first to use this information in tests of bidder opportunism. In the process, we provide granular information on the private part of the bidding process, which extends from the time of the deal initiation to the announcement of the first public bid. Surprisingly, while it is common to associate auctions with target-initiations (Boone and Mulherin, 2007a), we find that the number of (largely non-binding) bids during the private deal process prior to the first public bid announcement is, if anything, higher in bidder- than target-initiated deals. On the other hand, we confirm earlier findings that target-initiated deals are associated with lower average offer premiums (Masulis and Simsir, 2018), and that deals involving strategic buyers tend to use stock in the deal payment more often than financial buyers (Gorbenko and Malenko, 2018).

We perform our main tests of bidder opportunism in three distinct but complementary steps. In the first step, we estimate the likelihood of observing bidder shares in the deal payment as a function of both target information proxies and the identity of the initiating party. For both bidder- and target-initiations, we find that this likelihood is significantly *higher* the more precise is the target’s information about the bidder—not lower as predicted by bidder opportunism. To illustrate, we find that bidders are *more* (not less) likely to use their shares as acquisition currency when the two firms operate in similar product and labor markets, are physically located in geographically close areas, and when the target has access to public disclosure documents from recent acquisitions and seasoned equity offerings undertaken by the bidder.

Most important, we show that this impact of the target information proxies, which itself fail to support bidder opportunism, is also indistinguishable across bidder- and target-initiated transactions. This finding, which is robust to the inclusion of a large number of firm- and deal characteristics, suggests that bidder private information about market mispricing is largely irrelevant to a decision to initiate the takeover process and pay for the target in shares. The same evidence is, however, consistent with rational payment design, where bidders have an incentive to pay with shares as a partial hedge against target adverse selection (which occurs when the target’s shares are overvalued by the bidder). Under this alternative hypothesis, bidders who face relatively precisely informed targets are more likely to exploit their shares as an effective hedge instrument since those targets are also less likely to undervalue the

⁴See, e.g., Aktas, de Bodt, and Roll (2010), Masulis and Simsir (2018), Liu and Mulherin (2018), Fidrmuc and Xia (2019), and Brown Jr., Liu, and Mulherin (2023).

bidder shares.

In the second step of our empirical analysis, we structurally estimate the takeover model of Li, Taylor, and Wang (2018) after conditioning on the initiating party to the deal. Their model is particularly attractive in our context for three reasons: First, while the authors do not consider the initiation decision, their model proves the existence of a pooling equilibrium that in principle allows for rational opportunistic side-bets to otherwise synergistic takeover attempts. Second, it permits quantification of the difference (if any) in the potential inefficiency that arises from opportunism. Third, since all events in the model take place after the deal is initiated, our structural estimation does not rely on specific assumptions about the initiation process.

Our contribution in this second step is therefore to estimate the model of Li, Taylor, and Wang (2018) separately for bidder- and target-initiated subsamples and compare the resulting parameters. Differences in these deep parameters necessarily reflect the endogenous initiation decision that occurs prior to the start of the events in the model. For example, if bidder-initiated deals are truly driven by opportunism and overvaluation, the model’s misvaluation parameters should be higher in the bidder-initiated than in target-initiated deals. Moreover, because inefficiency losses are derived from the model parameters, our conditional inefficiency estimates inherently account for the endogenous initiation decision. Interestingly, we find that conditioning on deal initiations does *not* increase the fraction of the cases where opportunistic bidders crowd out higher-synergy bidders. Rather, this fraction is about 7% for both bidder- and target-initiations, and results in a synergy loss of only about 0.7% when averaged across the total sample. These quantities are almost identical to the findings Li, Taylor, and Wang (2018), who study 2,503 bids for public targets between 1980 and 2013.

In the third step, we provide new and substantial valuation-based evidence of relevance for the opportunism debate. Most important, after confirming the model assumption of positive deal synergies, we find that bidder-initiated takeovers are associated with a *positive* announcement-induced valuation effect for the bidder’s close industry peers—not negative as suggested by both the model of Rhodes-Kropf and Viswanathan (2004) and the valuation evidence in Rhodes-Kropf, Robinson, and Viswanathan (2005).⁵ Regardless of the party initiating the takeover, the peer-firm abnormal return averages a statistically significant 0.7%. Hence, rather than signaling overvaluation, the information in the deal announcements appears instead to reveal increased demand for an industry-specific resource (possibly driving expect-

⁵The industry peers are identified using the TNIC-3 industry relatedness scores from Hoberg and Phillips (2016).

tations of future takeover activity). Finally, we reject that the abnormal stock return (alpha) from a long-short trading strategy (long in bidder-initiated and short in target-initiated deals) is different from zero, which also fails to support bidder opportunism.

In sum, after endogenizing the deal initiation decision into our empirical tests, which include reduced-form regression analyses, structural estimation, and market revaluations, we conclude that successful bidder opportunism rarely exists (if at all), most likely because this type of bidder market timing is effectively unraveled by the target during the deal process itself. In other words, bidder opportunism is unlikely to distort the efficiency of the important resource allocation that regularly takes place in the US market for corporate control.

2 Takeover-initiation characteristics

2.1 Identification of the deal-initiating party

We start our sampling by selecting completed takeovers of US public targets from the SDC Platinum database from 2000–2020 to identify the initiating party. Of these, we can locate an SEC takeover filing, such as DEFM14A, PREM14A, and S4, for 3,353 targets. For each transaction, we carefully read the “background of the merger” section and classify the initiating party and other aspects of the sales process. This allows us to identify the initiating party for 2,968 public targets. The bidder is also a publicly listed firm in 1,845 of these deals. Much of the analysis requires bidder characteristics and will therefore be limited to our subset of public-to-public deals.

Our initiation classification is as follows: The takeover is classified as *target initiated* if the SEC documents reveal that the target board began the sales process by directly contacting a potential buyer or hiring an investment bank to find possible acquirers (sometimes after pressure from its shareholders). Even if an acquirer subsequently approaches the target, we classify the deal as target-initiated as long as the target board has previously started a sales process that puts the target firm in play (which, as mentioned above, also triggers the target director’s “Revlon duty” to sell to the highest bid).

Second, the takeover is classified as *bidder initiated* if it is started by a potential acquirer approaching the target. Note that the initiating bidder need not be successful: the initiation may be followed by a rival bidder that ends up acquiring the target. For our purposes, the important fact is that regardless of who eventually wins the target, the deal is initiated by a bidder with the potential for being opportunistic.

Third, the takeover is classified as *jointly initiated* if the initiation occurs through joint discussions between a bidder and the target, and there is no indication that either party initiated or was a driving force behind the transaction. About ten percent of the jointly initiated transactions are described as a “merger of equals”, where the acquirer and the target firm are of similar size and market value. Merger of equals are typically structured as stock swaps and leadership roles (board seats and executive positions) are often divided between the two firms to maintain a balance of power.

Figure 1 illustrates the time-series distribution of the sample deals and their three main categories of initiation: bidder, target, and jointly. Figure 2 shows the sample proportions of each initiation type, where we also separate out the two bidder-initiation categories (winning or rival bidder). In Panel A shows that, which uses the full sample of deals by both public and private bidders, 57% are bidder-initiated (45% by the winning bidder and 12% by a rival bidder), while 34% are target-initiated. The remaining 8% are jointly initiated. Panel B, which limits the sample to public bidders, shows that the sample initiation proportions are about the same also after considering public-to-public takeovers only.⁶

2.2 Firm and auction characteristics conditional on deal initiation

Table 1 shows bidder and target characteristics for the subsample of deals where both parties are publicly listed and compares them across initiation types. Acquirers in bidder-initiated deals tend to be larger, with total assets averaging \$14.4 billion vs. \$ 9.1 billion in target-initiated transactions, and a larger fraction pay dividends. However, the average acquirer has similar cash holdings, R&D levels, and M/B ratios across initiation types, undermining the notion that bidder-initiated deals are systematically driven by overvalued equity. As shown in Panel B, the targets, on average, are substantially smaller than their public acquirers (\$1.9bn vs. \$13.2bn), have lower M/B (2.86 vs. 4.23), and are less levered. However, there is no statistically significant difference in these target characteristics across bidder- and target-initiated deals. Interestingly, this observation also holds for the relative M/B of bidder and target firms,

⁶While this paper is the first to use initiation data to address bidder opportunism, our finding that about 40% of the deals are target initiated (directly or jointly) is consistent with a growing literature documenting initiation frequencies, albeit it in generally smaller samples of takeovers than what is used in this paper. Without identifying the initiating party, Boone and Mulherin (2007b) provide details on the private part of the sales process. In subsequent research, Atkas, de Bodt, and Roll (2010) use the identity of the initiating party in a sample 1,774 takeovers (1994–2007) to estimate bidding costs, while Masulis and Simsir (2018) and Liu and Mulherin (2018) condition on the initiating party in samples of 1,268 (1997–2012) and 388 (1981–2014), respectively, to study potential effects on final offer premiums. Fidrmuc and Xia (2019) sample 1,098 takeovers (2005–2020) and link initiations to executive incentives and compensation, while Brown Jr., Liu, and Mulherin (2023) show an increasing rate of target initiations in 1,821 deals from 1981 through 2020. The hitherto largest sample, with 4,787 cases from 1996–2014, is found in Eckbo, Norli, and Thorburn (2023), in which 47% are target initiated.

which has been a focus in much of the extant empirical debate over whether market misvaluation drives merger activity. We expand on the issue of relative M/B in Section 2.3 below.

The auction data presented in Table 2 confirms and extends earlier evidence on the “private” part of the sales process that typically takes place prior to the first public bid announcement. We record the dates and prices of all bids reported with a bid price (cash value or exchange ratio in stock swaps) or as an offer premium. The bid prices may be an exact value (e.g., \$80.00) or a price range (\$80.00-\$82.00). We also record the payment method (all-cash, all-stock, or mixed cash-stock offers) and whether the bid is binding or non-binding, verbal, written, or a tender offer, and note the date of the signed merger agreement (if any). The table also summarizes key features of the auction process conditional on initiation type. Focusing on the subsample of public bidders in Panel B, the private phase of the auction features on average 3.5 bids, with multiple bids in 74% and multiple bidders in 31% of the deals. This evidence is consistent with Boone and Mulherin (2007a), who find that about half of all deals involve some form of private competition, even when rival bids do not materialize.⁷

Table 2 also reports an average bid-jump (incremental increase in the bid) of 4.7%. This is somewhat lower than Boone, Maeseneire, Dereeper, Luybaert, and Thuy (2024), who document an average increase of 9.6% between the first and second bids in the private phase of the auction. The difference is consistent with bidders making increasingly smaller bid jumps as the auction progresses. Interestingly, the average bid-jump of 9.6% is very similar to that reported by Betton and Eckbo (2000) for the public phase of the auction process. In their sample of 1,353 public tender offers for US listed targets from 1971–1990, where the targets receive a total of 2,335 publicly announced bids, the bid-jump from the first to the second public bid averages 10% (their Table 3).

Moreover, consistent with the evidence in Masulis and Simsir (2018), the average offer premium (measured here as the offer price divided the target stock price one month prior to the offer date) is significantly lower for target-initiated than for bidder-initiated deals, with a difference of 18.42% when both firms are listed. This difference likely reflects that target who initiates also tend to have a relatively low pre-takeover return on assets (ROA) (Masulis and Simsir, 2018; Eckbo, Norli, and Thorburn, 2023).

Surprisingly, bidder-initiated deals tend to involve a somewhat more competitive bidding process than do target-initiated deals: the mean number of bids and fraction of auctions with multiple bids are

⁷For details of the private period, see also Liu and Mulherin (2018), Badawi and de Fontenay (2019), and Boone, Maeseneire, Dereeper, Luybaert, and Thuy (2024).

3.7 and 0.80, respectively, for bidder-initiated transactions and 3.1 and 0.65, for target-initiated deals. The differences, which are statistically significant, challenge the notion that target-initiated processes are systematically more competitive. Moreover, the percentage of stock payment and the fraction of all-stock deals are consistently *lower* for bidder-initiated deals, with 36% vs. 49% of the offer paid in stock and 19% vs. 30% of the offers paid in stock only. This pattern resurfaces repeatedly in our regressions below.

2.3 Deal initiation and relative M/B

The extant literature documents that merger activity exhibits a wave-like pattern, which are at least in part driven by regulatory and technological changes as well as time-series changes in firms' cost of capital (Holmstrom and Kaplan, 2001; Harford, 2005). Shleifer and Vishny (2003) further notice that periods with high merger activity are also periods with relatively high market valuations in terms of M/B. Moreover, since bidders that are temporarily overpriced by the market are more likely to use their shares as acquisition currency than are undervalued bidders, they point out that opportunism is also more likely in periods with M/B at peak values.

Rhodes-Kropf, Robinson, and Viswanathan (2005) address this issue further by decomposing M/B into firm- and sector-specific components. They infer that high M/B firms tend to buy relatively low M/B firms, and that this difference in M/B is driven by relative firm- and sector-specific misvaluations, not by fundamental or long-run differences. On the other hand, Harford (2005) find that the level of the short interest rate (a measure of market-wide liquidity) drives out the positive association between merger activity and bidder M/B. Eckbo, Makaew, and Thorburn (2018) further show that the association becomes statistically insignificant after instrumenting M/B with exogenous price shocks caused by substantial ($\geq 5\%$) aggregate mutual fund outflows.⁸ Also, Fu, Lin, and Officer (2013) conclude that a high relative bidder M/B before the merger announcement tends to disappear by the deal completion date. It is as if targets of bidders with exceptionally high M/B are particularly concerned with bidder adverse selection (opportunism) and reverse engineer this information during the price-discovery process.

As emphasized by Eckbo, Makaew, and Thorburn (2018) and throughout this paper, since bidders may prefer to stock-finance the takeover also when shares are correctly priced, identifying the presence

⁸As first shown by Coval and Stafford (2007), substantial fund outflows from widely diversified index funds may have tendency to lower market prices (akin to a "fire sales" effect). Edmans, Goldstein, and Jiang (2012b) and Eckbo, Makaew, and Thorburn (2018) exploit this exogenous price decline to identify, respectively, a higher probability of becoming a target (the lower target price may attract bidders) and a lower bidder incentive to use shares as acquisition currency.

of bidder opportunism requires going beyond correlating the frequency of stock-financed mergers with bidder valuation measures. While this identification is the main objective of sections 3 and 4.1 below, in Section 5 we also find that stock-financed mergers cause positive sector-specific valuation effects, which is in the opposite direction of that suggested by Rhodes-Kropf, Robinson, and Viswanathan (2005).

Given the wide-spread interest in the relation between M/B and merger activity, Figure 3 illustrate the average annual level of M/B across all Compustat firms during our sample period. As shown, public bidders have a higher mean M/B than all Compustat firms: 3.9 and 2.4, respectively. High-tech bidders tend to have the highest M/B with a value of 5.1 across the entire twenty-year period. Figure 4 shows the median ratio of bidder-to-target M/B for our sample of public acquirers only and sorted by bidder- and target-initiated deals. Interestingly, bidders typically have higher M/B than targets whether the deal is bidder- or target-initiated, with median relative values of 1.19 and 1.23, respectively measured over the full sample period. Importantly, the high persistence of and correlation between the two time series in Figure 4 suggest that neither merger waves nor which party initiates the deal matters much for the relative M/B over time.

The time-series pattern in Figure 4 is what one would expect if the bidder’s private information about market misvaluation at best plays a minor role in these takeovers. We next turn to formal tests of whether bidder opportunism exists and, if so, to what extent there is evidence of inefficient takeover outcomes in our data.

3 Do relatively uninformed targets attract opportunistic bids?

In this section, we first motivate and then use Proposition 1 below in an attempt to empirically separate bidder opportunism from the main alternative hypothesis—here labeled rational payment design. Under both hypotheses, the focus on how core information asymmetries between the bidder and target firms drive the bidder’s payment method choice and, hence, the market reaction to the deal announcement.⁹ We use standard regression controls for the potential relevance of more traditional capital structure tradeoffs. For example, as a stock payment may lower the leverage ratio of the combined firm relative to that of a cash bid, this particular payment choice may have its own valuation effect. To account for this

⁹There is substantial evidence that takeover premia and merger-induced abnormal stock returns are systematically related to the payment method. This evidence, which began with Huang and Walkling (1987), Travlos (1987), Franks, Harris, and Mayer (1988), and Eckbo and Langohr (1989), has since been systematically confirmed in large samples (Alexandridis, Antypas, and Travlos, 2017; Eckbo, Makaew, and Thorburn, 2018; Dessaint, Eckbo, and Golubov, 2025).

possibility, the cross-sectional choice model below includes the acquirer’s pre-offer leverage ratio and cash holdings as regression controls.

3.1 Key model primitive: The target’s information precision about the bidder

An important result of the early theoretical literature on takeovers is that information asymmetries between the bidder and target firms by itself may drive a strict preference for paying for the target with all-cash, all-stock, or a combination of the two (Hansen, 1987; Fishman, 1989; Eckbo, Giammarino, and Heinkel, 1990a). Below, we first preface the payment-method choice by adding the possibility that the bidder is also able to time deal initiation, which this literature treats as exogenous to their models. Conditional on the deal-initiation decision, We then use the basic result of the extant literature to motivate how a bidder optimally selects the payment method.

Let $\tilde{p}_b$ and p_b^* denote the market value of the bidder shares and the value of those shares conditional on the bidder’s private information, respectively. While the market and the target only knows the distribution over the mean-zero random pricing error $\tilde{\epsilon}_b = \tilde{p}_b - p_b^*$, the bidder knows the value of $\tilde{\epsilon}_b$ itself. Moreover, let σ_ϵ be the standard deviation of ϵ_b , and label a target with a low σ_ϵ as being more precisely informed about the bidder than a target with a high σ_ϵ :

Proposition 1 (opportunism v. rational payment design):

- (i): *With bidder opportunism, bidder-initiation decreases the optimal fraction bidder shares relative to target-initiation, and more so the greater is the target’s information precision σ_ϵ .*
- (ii): *Absent bidder opportunism, bidder-initiation increases the optimal fraction bidder shares relative to target-initiation, and the more so the greater is σ_ϵ .*

To explain Part (i) of Proposition 1, we start with the effect of interacting the deal payment with the party that initiates the deal process. We have that

$$Prob(\tilde{\epsilon}_{bt} > 0 \mid \text{Bidder initiation}) - Prob(\tilde{\epsilon}_{bt} > 0 \mid \text{Target initiation}) > 0. \quad (1)$$

That is, relative to treating the deal initiation as a random assignment, bidder initiation causes the target to update its prior beliefs about the bidder’s true value. This update in turn increases the target’s precision σ_ϵ and lowers the opportunistic bidder’s incentive to try to pay with overpriced shares. On the other hand, if the target initiates, the bidder increases its beliefs that the target shares may be

overvalued. However, as explained next, the optimal reaction for the bidder is then to increase (not reduce) the fraction stock in the deal payment. This explanation requires understanding the concept of *expected overpayment cost* of cash and stock, respectively, which are explained in Lemma 1:

Lemma 1:

*Regardless of who initiates the deal, the bidder prefers to pay for the target with its own shares to hedge against target adverse selection. It will substitute cash for shares only if the target substantially under-values those shares.*¹⁰

Motivation: Let x_b and x_t denote the standalone values of bidder and the target, respectively. Moreover, suppose the bidder generates bidder-specific synergy gains of s and denote the with-synergy value as $\Omega = x_b + s$. Also, let $\hat{\Omega}$ be the target's beliefs given the offer (c, z) , where c is the amount of cash and z is the fraction of the post-merged firm to be held by target shareholders. Suppose the bidder makes an offer that is acceptable to a target worth t^* or less, i.e.

$$z(t^* + \hat{\Omega} - c) + c \geq t^*. \quad (2)$$

Fix target beliefs $\hat{\Omega}$ and use Eq. (2) to solve for the minimum value of z that this target will accept:

$$z = \frac{t^* - c}{t^* + \hat{\Omega} - c}. \quad (3)$$

The bidder wants to maximize the value of its residual claim on the merged firm, $(1 - z)(E[t|a] + \Omega - c)$. Substituting Eq. (3) into this residual claim yields the expected value $E[v|a]$ to the bidder of offering (c, z) :

$$E[v|a] = (1 - z)(\Omega + E[t|a] - c) = \frac{\hat{\Omega}}{\hat{\Omega} + t^* - c}(\Omega + E[t|a] - c). \quad (4)$$

This shows that the value of the bidder's residual claim is a function of both the target's beliefs, $\hat{\Omega}$, and the amount c of cash in the offer. For fixed beliefs, Eq (4) illustrates the tradeoff between z and c . To

¹⁰The role of bidder cash constraints is addressed in Section 4 below.

illustrate, the following compares all-cash and all-stock offers:

$$E[v|a] = \begin{cases} \Omega + E[t|a] - c & \text{if } c_j = t^* \text{ (all cash offer)} \\ \frac{\hat{\Omega}}{\hat{\Omega} + t^*}(\Omega + E[t|a]) & \text{if } c_j = 0 \text{ (all stock offer).} \end{cases} \quad (5)$$

The difference between these two offers yields:

$$E[v|a, c = t^*] - E[v|a, c = 0] = \frac{t^*}{\hat{\Omega} + t^*}[(\Omega - \hat{\Omega}) - (t^* - E[t|a])]. \quad (6)$$

Eq. (6) shows that the bidder prefers an all-cash offer only if the target's undervaluation of the bidder exceeds the expected overvaluation cost of paying with cash, i.e., when $(\Omega - \hat{\Omega}) > (t^* - E[t|a])$. Otherwise, the expression in Eq. (6) is negative and the bidder prefers payment in all-stock. Also important, the bidder strictly prefers an all-stock offer even if the target knows the true bidder value ($\hat{\Omega} = \Omega$) as the only relevant cost is now the expected overpayment cost of cash ($t^* - E[t|a] > 0$). Intuitively, while cash precommits the bidder to a payment worth t^* for all target types ex ante, payment in bidder shares conditions the value of the deal payment on the realized value of the target type ex post.¹¹

Note also, in the above framework, opportunism is another term for adverse selection on either side of the deal. Target opportunism causes the positive expected overpayment cost of cash $t^* - E[t|a] > 0$, which pushes the bidder towards using shares in the deal payment. Bidder opportunism occurs when $\Omega - \hat{\Omega} > t^* - E[t|a] > 0$, pushing the bidder to offer stock as deal payment in the hope that the deal payment itself does not fully reveal the overvaluation. Under rational payment design, payment in bidder shares dominate all-cash offers when the expected overpayment cost of cash exceeds that of stock, i.e., when

$$\frac{t^* - E[t|a]}{\Omega - \hat{\Omega}} > 1. \quad (8)$$

That is, the expected overpayment cost of cash ($t^* - E[t|a] > 0$) pushes the target towards paying with shares unless the shares are sufficiently undervalued by the target ($\Omega - \hat{\Omega} > 0$). Hence, the lower is σ_ϵ ,

¹¹While Eq. (6) focuses on the tradeoff between the costs of all-cash and all-stock bids, the same tradeoff reappears when changing the amount of cash at the margin. From Eq. (4):

$$\frac{\partial E[v|a]}{\partial c} = \frac{\hat{\Omega}}{(\hat{\Omega} + t^* - c)^2} \left[(\Omega - \hat{\Omega}) - (t^* - E[t|a]) \right], \quad (7)$$

Again, the two terms inside the large square bracket shows that $\partial E[v|a]/\partial c < 0$ if $t^* - E[t|a] > \Omega - \hat{\Omega}$, and the bidder prefers an incremental reduction in the fraction cash in the deal payment.

the greater the chance that the ratio in Eq. (8) exceeds one, which in turn lowers the optimal c^* . ■

The above analysis assumes that the probability of bid success equals one (target t^* accepts the offer). Lemma 2 below shows that Proposition 1 is robust to allowing for unsuccessful bids as well as rational equilibria in which the target is unable to fully separate bidders with different true values:

Lemma 2:

The efficient payment design in Proposition 1 is (i) exacerbated by allowing for unsuccessful bids and bidder cash constraints, and (ii) holds whether the efficient payment method choice in equilibrium fully or only partially reveal the true bidder value.

Motivation: In Part (i), since bid failure is costly (it means the loss of expected synergy gains), it can be shown that allowing for unsuccessful bids tilts the efficient tradeoff between cash and stock in Proposition 1 toward payment in stock (see, e.g., Eckbo, Malenko, and Thorburn, 2025, for proof). The reason is that, as before, payment in bidder shares leads some high-valued targets accept the offer that they would otherwise have rejected if paid in cash. Since deal completion benefits both parties, this leads to a higher probability of target acceptance of the bid. As to adding a binding bidder cash constraint (see, e.g., Gorbenko and Malenko, 2018; Li, Taylor, and Wang, 2018), it immediately tilts the payment towards bidder shares without changing the basic principle behind the optimal payment design.

Turning to the nature of the equilibrium (Part (ii) of Proposition 2), note first that, since cash is a costly form of payment (it exacerbates the bidder’s adverse selection problem), including cash in the deal payment signals to the target that it undervalues the bidder shares ($\Omega - \hat{\Omega} > t^* - E[t|a]$). In equilibrium, the target’s reaction to this information is taken into account. Let $c^* = c/t^* \in [0, 1]$ denote the fraction of the total deal payment in cash. Several models prove the existence of separating equilibria in which the choice of c^* fully reveals the bidder type (that is, for two bidders j and k , $c_j^* > c_k^*$ reveals that $\Omega_j > \Omega_k$).¹²

Finally, as we discuss further in Section 4.1 below, while bidder opportunism cannot succeed in a fully revealing equilibrium, Rhodes-Kropf and Viswanathan (2004) and Li, Taylor, and Wang (2018) derive pooling equilibria in which rational targets remain unable to infer the true bidder value. Hence,

¹²See Eckbo, Giammarino, and Heinkel (1990a) and Berkovitch and Narayanan (1990). Liu and Bernhardt (2021) assume that deal synergies are increasing in the bidder’s stand-alone value x_b but at a decreasing rate. This means that a low- x_b bidder favors paying in stock (bidder adverse selection) and dislikes paying in cash (due to lower synergies). Conversely, higher bidder types select more cash and less stock, thus supporting a fully separating equilibrium. They also show that this holds for other securities of varying information sensitivity. See also DeMarzo, Kremer, and Skrzypacz (2005) for a general treatment of auction security design.

targets in those models will occasionally and unknowingly accept payment in overpriced bidder shares. Nevertheless, the basic informational tradeoff between cash and stock as payment method explained in this section is also used to support those pooling equilibria. In sum, Proposition 1 holds across a wide variety of auction settings. ■

3.2 Testing opportunism v. rational payment design

We start the empirical analysis of Proposition 1 with the simple, univariate regression in Table 3. It shows the coefficient estimates from probit estimations of the likelihood of an all-stock bid and Tobit estimation for the fraction of stock in the deal payment in the subsample of public bidders. The explanatory variable is a dummy for bidder-initiated deals (the regressions also contain an intercept, which is not tabulated). Interestingly, bidder initiation is associated with a statistically and economically significant *reduction* in the likelihood and extent of stock usage. The probit coefficient is -0.367 ($t=5.66$), and the Tobit coefficient is -0.478 ($t=5.67$). This result is robust to limiting the sample to bidder- and target-initiated deals (columns 2 and 5), and to bidder- and jointly-initiated deals (columns 3 and 6). The negative relationship between bidder initiation and the use of stock payment contradicts Part (i) of Proposition 1, which is the core implication of bidder opportunism. On the other hand, the same evidence is consistent with Part (ii), which is based more generally on rational payment design under asymmetric information.

Adding the firm-level controls and information variables defined in Table 4 to the regressions in Table 3, Table 5 presents our full-blown conditional estimation of the likelihood of stock payment. Columns (1) and (5) in Table 5 list the baseline model coefficients, including acquirer and target-industry characteristics. As shown, larger bidders are less likely to use stock, while a large relative deal size increases stock usage. These relationships are intuitive: larger firms tend to have more internal financing, while large deals may require equity financing. Moreover, in line with several earlier studies, bidders with a relatively high M/B ratio tend to use stock. Note also that increased competition from *private* bidders in the target’s FF49 industry, increases the use of cash in the deal payment. This result is intuitive since unlisted shares are relatively illiquid. As explained in Section 3, targets tend to value a cash-offer higher than the same offer paid in stock. Hence, high competition from private bidders tend to also restrict a listed bidder’s ability to pay with shares, which the data strongly bears out.

To begin testing of Proposition 1, we start with columns (2) and (6), which add target information proxies that are intended to capture how precisely the target is able to estimate the true value of the bidder

shares. Of the four information variables, three enter with a positive and significant sign: *Local Deal* where the target is located geographically close to the bidder (within 5 miles), *H-P Industry Relatedness* where the two firms operate in similar product and labor markets (measured by the Hoberg and Phillips (2010) similarity score), and *Recent SEO* where the bidder recently (within the past 18 months) made a seasoned equity offering to the public. These findings, while rejecting Part (i) of Proposition 2 (that bidders opportunistically pay with stock), are consistent with Part (ii): Facing a relatively well-informed target lowers the bidder’s expected overpayment cost of stock (relative to a cash payment) and, therefore, increases the incentive to pay with shares.

Next, and most important, in the remaining columns in Table 5, we add a dummy for bidder initiation (columns 3 and 7), and the interaction of this dummy with the target information proxies (columns 4 and 8). As stated in Part (i) of Proposition 1, If bidder mispricing indeed drives the decision to pay with stock, this effect should be strongest when the bidder endogenously times the initiation to coincide with market misvaluation. Hence, adding the bidder-initiation dummy increases the power to detect bidder opportunism in the form of showing lower use of bidder shares for better informed targets.

First, in columns (3) and (7) of Table 5, adding the dummy for bidder-initiation confirms the earlier univariate regression result in Table 3 that bidder-initiation lowers (does not increase) the likelihood that the deal payment includes stock. Second, none of the interaction variables in columns (4) and (8) are significant. For example, the interaction variable *Local Deal x Bidder Initiated* takes a value of 0.134 with a t-value of 0.60. The insignificance of the interaction variable indicates that, relative to target-initiation, bidder-initiation does *not* amplify the role of target information about the bidder or the potential misvaluation.¹³

The empirical results in Table 5 (columns 2 and 3 for the all-stock probability and columns 6 and 7 for the fraction stock in the deal payment) suggest that the bidder’s concern with adverse selection on the target’s side of the deal is more important than the target’s concern about bidder opportunism. To further examine this important conclusion, we next turn to a structural analysis of the competitive (two-bidder) auction model of Li, Taylor, and Wang (2018).

¹³This conclusion is also robust to excluding the 8.4% jointly initiated deals from the sample.

4 Are bidder-initiated deals less efficient?

In this section, as summarized in Proposition 2 below, we condition key theoretical implications of the takeover model developed by Li, Taylor, and Wang (2018) (henceforth LTW) on the party initiating the deal. While our Proposition 1 above imposes relatively few theoretical restrictions, Proposition 2 works within LTW’s specific equilibrium framework. The benefit of imposing the additional model restrictions is that they permit a structural estimation of the efficiency loss when overvalued but low-synergy bidders crowd out high-synergy rivals for the target given the model parameters and relative to a counterfactual economy with no misvaluation uncertainty. A second advantage of this model for our purpose is that all events in the model formally take place *after* the initiation decision—the model essentially treats this decision as a random assignment.¹⁴ Hence, our conditioning the fraction inefficient deals on whether the takeover is bidder- or target-initiated directly isolates the differential crowding-out effects (if any) that results from the participants’ endogenous timing decisions.

4.1 Deal initiation and inefficient crowding out

LTW model a sealed-bid, second-price auction with two synergistic bidders with private valuations of the target. While the target value is common knowledge (one-sided information asymmetry), each bidder come with three variables that are unobservable to the target: (1) the market misvaluation of the bidder’s stand-alone value, (2) the synergy gains, and (3) the bidder’s cash constraint. Since the target only observes the bidder market value and the fraction cash in the offer, it cannot infer these three unobservables and is vulnerable to bidder opportunism. For example, an overvalued bidder with a low synergy component may bid the same as a more efficient high synergy bidder. Or, an all-stock bid may reflect a binding cash constraint rather than market overvaluation. As the target remains confused this way, there is some positive probability that it will accept an opportunistic bid that is scored as the most valuable for the wrong reason.¹⁵

In this model, market misvaluation of bidder shares can create both a crowd-out and redistribution effect. Crowding out occurs when an overvalued bidder who pays with shares wins the target after

¹⁴“We take the targets and acquirers as given, and we do not model the choice to participate as a target or acquirer. Therefore, the model’s parameters describe the pool of firms that have already endogenously selected to be acquirers and targets.” (LTW p.269).

¹⁵After scoring the winner, the target computes the payment using the second-price settlement rule: Holding c_j constant, z_j is lowered to the point where the target deems the winning bid to be equal in value to the second-highest (losing) offer. See the Internet Appendix of Li, Taylor, and Wang (2018) for details.

defeating a more efficient (higher synergy) but less overvalued rival bidder. Redistribution occurs when an overvalued bidder loses the target to a more efficient rival bidder after the share offer forces the rival to pay a higher premium.

Proposition 2 (inefficient crowding out):

Suppose one of the two bidders in the model of LTW selects the time of the deal initiation to coincide with private information that its shares are overpriced by the market. Then, the structurally estimated frequency of cases where the overpriced bidder crowds out a more efficient one will be higher when conditioning on the takeover being bidder-initiated.

Motivation: The argument is straightforward since, in this model, all events take place *after* the initiation decision itself. Hence, different crowding-out effects (if any) across the two subsamples of bidder- and target-initiated that are driven by the model must come from the endogenous initiation-decision. Hence, a test based on the difference in the estimated fraction of inefficient takeovers across bidder- and target-initiated deals necessarily increases power to reject the putative bidder opportunism in the data. ■

4.2 Structural estimation procedure

The basic structure of the LTW model is as follows:

- (1) Two strategic bidders compete for one target in a sealed-bid second price auction with private and independent synergy valuations.
- (2) The following three moments, while privately observable to each bidder, are unobservable to the target: The market's misvaluation (ϵ_i) of the bidder, the synergy gain ($s > 0$), and the bidder's cash capacity (k).
- (3) The target's value (standardized without loss of generality to 1) is commonly known (one-sided information asymmetry). The target only observes the bidder's relative size (market value M) and the mix of cash and stock in the bid.
- (4) In equilibrium, given the auction format, bidders optimally bid their true valuation of the target, while the target scores bids using a Bayes rational rule that discounts equity when it infers equity is more likely to be overvalued (bidder adverse selection).

LTW demonstrate in their online Internet Appendix A.1 that the equilibrium in this sealed bid second-price auction is equivalent to the open ascending (English) auction more commonly used in the literature (see, e.g., Fishman, 1989; Gorbenko and Malenko, 2014, 2018; Dimopoulos and Sacchetto, 2014). Hence, the auction setting is as if the two bidders make repeated offers with ascending values until one bidder drops out, then the remaining bidder pays the last value offered, evaluated at the expectation of the target.¹⁶

Since the target cannot infer the three unobservable characteristics (s, ϵ, k) from only two observables (M and the mix of cash and equity in the bid), the model produces a (Nash) pooling equilibrium in which the target may (unknowingly) accept overpriced bidder shares in the offer. That is, since the target and market only adjust for the *average* misvaluation in the group of bidders who make the same type of bids, a bid made by an acquirer with above-average over-valuation relative to its group is still inflated after the target's (and market's) adjustment. In this setting, the equity bid looks more attractive than it really is, allowing the bidder to profit from paying with overvalued equity. Fundamentally, the target may confuse such as opportunistic stock-financed offer with one that is correctly priced and where the bidder pays for the deal with shares due to a lack of access to cash (an unobservable liquidity constraint).

Table 6 summarizes key steps in the structural SMM (Simulated Method of Moments) estimation procedure. To make our results directly comparable to those of LTW, we employ their computer routines (generously supplied to us). The estimation uses eight data moments to exactly identify the eight unobservable model parameters $\Theta = (\mu_s, \sigma_s, \mu_e, \sigma_e, \mu_k, \sigma_k, \rho_{sM}, \rho_{kM})$, and the acquirer characteristics are treated as an independent realization from the joint Normal distribution:

$$(s, \epsilon, k, M) \sim F(N_s(\mu_s, \sigma_s), N_e(\mu_e, \sigma_e), N_k(\mu_k, \sigma_k), M(.); \rho_{sM}, \rho_{kM}). \quad (9)$$

The three *synergy-parameters* $(\mu_s, \sigma_s, \rho_{sM})$ are identified from the mean and variance of the offer premium (OP) and the correlation between s and M . The latter is identified as a_1 in the cross-sectional regression specified under part I.(1) of Table 6. This correlation is empirically motivated by evidence that larger acquirers often pay higher premiums (e.g., Alexandridis, Fuller, Terhaar, and Travlos, 2013), which suggests a possible positive correlation between the acquirer's size and deal synergies (also borne out by our data). The three bidder *cash-constraint* parameters $(\mu_k, \sigma_k, \rho_{kM})$ are identified from the mean and

¹⁶See LTW for the exact scoring rule used by the target to rank the two competing bidders.

variance of fraction bidder’s cash holding (*Cash*) and the regression parameter c_1 .

Moreover, of the two *bidder misvaluation* parameters $(\mu_\epsilon, \sigma_\epsilon)$, the first is identified from the average bidder announcement return $CAR(-1, 3)$ (assumed also to be unobservable to the target). The second—the signaling effect σ_ϵ of the fraction cash in the bid—is the regression parameter b_1 estimated using b_1 in the *CAR* regression also shown in part I.(1) of Table 6. Note that, since the target and market share similar beliefs about the acquirer’s equity value, the market’s revaluation $CAR(-1, 3)$ is internally consistent with target’s own expected revaluation effect. Hence, the target need not wait to observe the market reaction before rationally scoring the bids as a function of the fraction cash.¹⁷

Table 7 and Figure 5 provide information on the empirical distributions of the observed data moments and the associated fit of the structural model for our total sample. Figure 5 shows that, based on our total sample, the empirical distributions of the offer premium, cash fraction in the bid, and acquirer announcement returns are quite similar in the data and in the simulated model.¹⁸

Panel A of Table 7 shows that the offer premium averages 46.3%, with a model prediction of 49.9%. Moreover, the offer premium exhibits a strong positive correlation with the relative size of the acquirer (a slope coefficient of 0.033 with a model prediction of 0.023). In Panel B, the average fraction of the deal paid in cash is 30.6%, with a model-predicted fraction of 30.8%. Note that Panel B also shows that bidder-initiated deals have a *higher* fraction of cash in the deal payment than do target-initiated transactions: 69.9% versus 56.4%, respectively. As for the acquirer announcement returns in Panel C, $CAR(-1, 3)$, which is estimated as in Table 11 in Section 5 below, averages -1.5%. Interestingly, the average $CAR(-1, 3)$ is *lower* (-1.1%) for bidder-initiated deals than for target-initiated transactions (-2.1%). As discussed further in Section 5 below, with successful bidder opportunism one expects the opposite result.

4.3 The conditional fraction of inefficient auction outcomes

We are now in a position to address (1) *the fraction inefficient outcomes* (when the low-synergy but overpriced bidder wins the auction) and (2) *the redistribution effect* (as an overpriced loser forces the

¹⁷While the three cross-sectional regressions shown under I.(1) in Table 6 all use the same vector *Controls*, this vector is excluded in the simulations since they do not belong to the theoretical model. *Controls* includes year indicators, targets’ Fama–French 48 industry indicators, and five target characteristics: logarithm of market capitalization, market leverage, market-to-book ratio of equity, return on assets, and cash-to-assets ratio. As LTW, we reach similar conclusions without including *Controls* when measuring the moments. As also pointed out by LTW, the primary advantage of dealing with heterogeneity this way is that it is computationally feasible (since the model does not have a closed-form solution).

¹⁸Figure 5 confirms a similar property that is shown in LTW’s Figure 3 using their sample of M&As.

winner to pay a higher second-price). Table 8 shows the fraction inefficient outcomes and average synergy loss for the total sample. The synergy loss is computed as the difference in simulated synergy gains between the inefficient winner and the more efficient loser. Note also that the computation of this synergy loss does not require simulation of a separate counterfactual economy: the inefficiency computation just reuses the baseline simulations.

In Panel A of Table 8, inefficient deal outcomes on average occur in only 6.10% of the simulations. The table also quantifies the average efficiency loss due to opportunism, either as a percent of the target's pretakeover (standalone) market value (Panel B) or the losing bidder's higher synergy (Panel C). In Panel B, the simulated synergy loss in efficient deals averages 10.10% of the target size and 19.20% of the highest synergy. In Panel C, where the loss is computed as a percent of all deals, the average loss is only 0.62% of the target size and 1.17% of the highest synergy.¹⁹

Turning to Proposition 2, recall that, due to the self-selection, inefficient outcomes are more likely among takeovers initiated by a bidder than by the target. Since endogenous self-selection occurs prior to the start of the deal process, the proposition holds across a wide variety of specific sales processes (including the one modeled by LTW). This is because the sales process itself only affects the extent to which the target detects the putative bidder mispricing (if any). We therefore benchmark the risk of accepting overpriced bidder shares with the deal outcome in target-initiated deals. This benchmark provides a lower bound on the likelihood of opportunism in bidder-initiated deals.

In addition to reporting statistics for the full sample (columns 1-2), Table 9 splits the total sample into bidder- and target-initiated deals, respectively, (columns 3-6). Notice first that, while the subsample results are all close to the full-sample, the average percent of inefficient deals in Panel A is, if anything, *lower* in bidder-initiated transactions than in target-initiated ones: 6.27% versus 7.37%, respectively. Moreover, the average simulated loss in inefficient deals is also somewhat lower (and never higher) for bidder-initiated transactions than in target-initiated ones. These estimates suggest that bidders use stock as acquisition currency primarily for efficiency reasons rather than to get away with selling overpriced shares to the target.

¹⁹Notwithstanding the different sample periods, the total sample results in Table 8 correspond closely to those reported by LTW. For example, our 6.10% inefficient deals correspond to 7.01% reported by LTW in their Table 5. Moreover, our 0.62% average synergy loss across all deals correspond to LTW's 0.63% in the same table.

4.4 The conditional redistribution effect of inefficient deals

Figure 6 shows the redistribution effect (the effect of misvaluation on a bidder’s takeover gains), defined as the difference in bidder gains between the estimated (with misvaluation, $\sigma_\epsilon > 0$) and counterfactual (without misvaluation, $\sigma_\epsilon = 0$) economy. The sample is split by deals initiated by the bidder (Panel A) and the target (Panel B), and by low-synergy (left graph, $s = 0.4$) and high-synergy (right graph, $s = 0.8$) bidders. Thus, the simulations in Figure 6 assumes a fixed synergy level, while the earlier simulations treated synergy as a random variable, $s \sim N_s(\mu_s, \sigma_s)$, truncated at zero. Moreover, each graph also shows the effect for bidders with zero, intermediate, and sufficient cash holdings, who can pay, respectively, 0%, 50% and 100% of the offer price in cash. Each curve describes how the redistribution effect varies with bidder i ’s misvaluation, *ceteris paribus*. A bidder’s misvaluation ϵ_1 (x-axis) is measured as the number of standard deviations from the sample mean.

As expected, the wealth redistribution is increasing in bidder misvaluation. Moreover, cash capacity helps undervalued and fairly valued bidders to avoid the adverse effects of opportunistic bidders. For example, relative to the benchmark economy, in the two right panels, high synergy bidders with either a zero intermediate cash capacity has substantial more to gain the lower is the degree of misvaluation. Also, misvaluation causes a substantial redistribution of merger gains from undervalued to overvalued acquirers. The most important message from Figure 6, however, is that the simulated wealth redistribution is nearly identical whether the deal is bidder-initiated or target-initiated. According to our Proposition 2, this outcome is inconsistent with the bidders selecting the time of the deal initiation to coincide with private information that the shares are overpriced by the market.²⁰

4.5 Bidder initiation, stock financing and cash constraints

In the theoretical analyses in both sections 3 and 4 above, cash holdings is particularly valuable to undervalued bidders because they can signal their undervaluation by offering cash instead of shares. In Section 3, acquirers by assumption have unlimited cash capacity, which implies that relatively undervalued acquirers are always able to fully separate from overvalued ones by making all-cash offers and there is

²⁰LTW find that their main simulation results are highly robust to several alternative assumptions about the model or empirical implementation (see their Internet Appendix). For example, they distinguish between high and low degree of acquirer managerial entrenchment, number of bidders, blockholder ownership, CEO overconfidence, merger type (horizontal versus diversifying), excluding high-intangibility targets, and focusing on bids with no M&A or SEO occurred surrounding the deal. Since the initiation decision studied here is exogenous to their model, these interesting robustness tests, which help motivate our use of their basic model framework, need not be repeated in this paper.

no scope for opportunistic behavior. However, in Section 4, financing constraints limit bidders’ access to cash, which by itself forces some bidders to finance part of the deal using shares even if undervalued. Since this cash constraint is not perfectly observable by the target, it also limits undervalued acquirers’ ability to perfectly separate themselves from overvalued acquirers. This in turn produces a pooling equilibrium in which targets are unable to accurately value the bidder shares that are offered as payment in the deal.²¹

Figure 7 provides evidence on whether the acquirer’s cash capacity tends to differ across bidder- and target-initiated takeovers. The figure lists the annual median cash-to-total-asset ratios for the two groups, which average 8.6% and 8.5%, respectively, over the total sample period. Statistically, the median cash ratios are similar across the two groups, leaving no evidence that the endogenous selection of the decision to initiate the deal is related to the observable cash ratios. Table 10 examines this question further by decomposing the cash holding into two components—(1) the cash target and (2) the deviation from cash-target—and adding these two variables to the cross-sectional estimation of the probability of observing stock in the deal payment. Otherwise, Table 10 has the same structure as Table 5, which we already discussed in Section 3 above.

The idea behind this decomposition is to empirically implement the notion that the bidder’s cash constraint may be unobservable to the target. Specifically, while the bidder’s total cash holding is indeed observable, the fraction of this holding that the bidder is willing to dedicate to the financing of the takeover—and which depends on bidder’s concurrent commitments to other investment projects—likely is not. Thus, we treat the fraction potentially dedicated to this takeover as the deviation from a firm-specific cash-target, where the cash-target itself is used to finance ongoing needs for working-capital and other investment options. The Cash-target is estimated as the fitted value of the following ordinary least squares (OLS) year-by-year regression across the universe of industrial Compustat firms in a given acquisition-year t :

$$\left(\frac{Cash}{TA}\right)_t = f(X_{t-1}) + g_t, \quad (10)$$

²¹In the above structural estimation, the acquirer’s misvaluation (ϵ) and cash capacity (k) are assumed to be uncorrelated. Alternatively, this correlation might be positive if overvalued firms can more easily raise cash by issuing equity or debt prior to the M&A transaction and presuming such fundraising activity does not itself eliminate the mispricing by the market. This may in turn increase the inefficiency because the positive correlation makes undervalued bidders, who want to pay with cash, more cash constrained. It is then easier for overvalued acquirers to mimic undervalued acquirers by paying equity. With this in mind, LTW re-estimates their model assuming the correlation is large (+20% or -20%) and find that the estimated percent of the deals that are inefficient increases only slightly (less than 0.1% in each direction). Hence, they conclude that “even if misvaluation and cash capacity were highly correlated, we would still conclude that the inefficiency is quite small.” (p.287).

where *Cash* is the firm’s cash holding, *TA* is total assets and the vector X_{t-1} of lagged firm characteristics contains Firm Size, Operating Efficiency, M/B, R&D, Missing R&D Dummy, Asset Tangibility, Leverage, and a dummy for the acquirer’s FF49 industry. Missing R&D Dummy indicates a missing Compustat value. The fitted residual from this regression defines the variable Deviation from Cash-target.

In Table 5 above, Cash Holding (the total cash variable) receives a statistically insignificant regression coefficient in all of the regression specifications. In Table 10, however, increasing values of the Cash-target component of this total cash holding significantly reduces the estimated probability of using bidder shares as deal payment. At the same time, the estimated Deviation from the Cash-target has no statistically significant relation to the payment method choice. Most important, while bidders are more likely to favor an all-cash payment the greater the cash-target, this tendency disappears after conditioning on the takeover being bidder-initiated. In sum, while bidder-initiated deals at least in principle are more likely to involve overvalued acquirers, our decomposition of the bidder’s cash holding fail to identify a systematic association between the likelihood of bidder opportunism and its access to cash.

5 Firm- and sector-specific valuation effects by deal initiation

Having examined determinants of the payment method choice as a function of the target’s level of information about the acquirer (Section 3), and structurally estimated the potential for inefficient deal outcomes (Section 4), we next examine the market reaction to bidder-initiated deal announcements.

5.1 Empirical proposition

Proposition 3 (valuation effects):

- (i):** *In a bidder-initiated and stock-financed takeover, the market reacts by decreasing the value of the bidder’s assets in place (adverse selection effect) while adding the value of the bidder’s share of expected synergy gains. The negative adverse selection effect is decreasing in the fraction cash in the deal payment.*
- (ii):** *Under bidder opportunism, a portfolio long in bidder-initiated and stock-financed merged firms and short i target-initiated ones will earn negative Jensen’s alpha as the market corrects the putative bidder overvaluation.*
- (iii):** *In industries where takeover synergies are sector-specific, the takeover announcements under (i)*

cause a positive revaluation also of the industry peers unless more than offset by a signal that the peer-firm assets are also overvalued.

Motivation: Part (i) follows from the adverse selection effect of bidder-initiations discussed above, and the assumption of positive takeover synergies underlying all rational takeover models under asymmetric information. Moreover, as first theorized by Eckbo, Giammarino, and Heinkel (1990a), when cash is a costly medium of exchange relative to bidder stock, a greater proportion of the deal payment paid in cash signals (in equilibrium) greater prebid market undervaluation of the bidder. In Part (iii), takeover synergies are industry-specific, i.e., correlated across industry peers. For example, this is the case in Rhodes-Kropf and Viswanathan (2004), where this correlation causes rational targets to confuse high stock bids with high synergies rather than market overvaluation and (unknowingly) accept overpriced bidder shares. This type of sector-specific overvaluation further lowers the market reaction to bidder-initiated and stock-financed takeovers. ■

5.2 Bidder and target announcement returns

With rational agents, positive deal synergies is necessary to fund the bidder’s expected overpayment cost under target adverse selection (and thus to satisfy the classical no-trade theorem in Milgrom and Stokey, 1982). While the existence of positive synergy gains has been supported by recent large-sample studies, we begin by verifying the existence of positive expected takeover synergies also in our unique sample with data on deal initiations.²²

We use the conditional event parameters γ_i^j ($j = 1, 2, 3$) in the following four-factor return-generating process below to isolate the daily abnormal stock returns of the successful merger bid for target i . The total estimation period runs from day $t = -297$ where day 0 is the first public announcement of the first public bid for the target firm to the effective merger date. The latter, which is specific to each target firm, is capped here at $t = 180$ days (9 months) after day 0:

$$R_{it} - R_{ft} = \alpha_i + \sum_{k=1}^4 \beta_{ki} F_{kt} + \sum_{j=1}^3 \gamma_{ji} d_{jt} + \epsilon_{it} \quad (11)$$

R_{it} and R_{mt} are the daily stock returns to firm (or portfolio) i (from CRSP) and the value-weighted

²²See Alexandridis, Antypas, and Travlos (2017) and Dessaint, Eckbo, and Golubov (2025). Dessaint, Eckbo, and Golubov (2025) also report a gradual decline in the portion of total deal synergies that are bidder-specific.

(CRSP) market portfolio, respectively, and R_{ft} is the daily risk-free (using the US three-month Treasury bill return). The four factors F_{kt} model are the excess return on the CRSP value-weighted market portfolio ($R_{mt} - R_{ft}$), Fama and French (1993)’s size and B/M factors (SMB and HML), and a momentum factor (MOM).

The three dummy variables d_{jt} , $j \in [1, 2, 3]$, take a value of one in their respective event window and zero otherwise. The event window of main interest is $(-1, +1)$, where γ_{2i} captures the daily market reaction to the first public offer announcement. Hence, the cumulative announcement-period abnormal return is $CAR_{2i} = 3\gamma_{2i}$, which is the main focus of our analysis and tabulated below (the two remaining event periods, the average estimates of CAR_{1i} and CAR_{3i} are reported in Internet Appendix). The first event period is covered by the dummy variable d_{1i} , which takes a value of one over the “runup period” $(-42, -2)$. It is included to control for partial anticipation effects. The third event period (d_{3i}) takes a value of one during the “post-announcement period” $(2, \min[i's \text{ effective date}; 180])$ captures abnormal price adjustments that may occur following the first public offer announcement.²³

Table 11 reports average three-day abnormal announcement-induced stock returns, i.e., the average $CAR_{2i} = 3\gamma_{2i}$, which is labeled CAR(1,1) in the table. The analysis restricts both the bidder and the target firms to be publicly listed. Confirming extant evidence based on much larger sample sizes (Dessaint, Eckbo, and Golubov, 2025), the average bidder announcement return is negative and significant ($\approx -1.5\%$), while the target realizes large and highly significant gains ($\approx 28\%$).²⁴ More important for the theoretical focus of this paper, Panel C confirms that total deal synergies, here measured as the value-weighted sum of the two firms’ CAR-values, is positive and statistically significant ($\approx 2\%$). This supports the theoretical assumption that rational bidders who face target adverse selection finance the expected overpayment cost of the target shares from the joint synergy gains.

Even more surprising, in all panels showing bidder announcement returns (panels A-C), the rightmost column of the table (Column 4) shows that the average bidder CAR(-1,1) is significantly *greater* in bidder-initiated than in target-initiated transactions.²⁵ This evidence appears to contradict Part (i) of

²³The regression in Eq. (11) delivers the standard error of the event parameter j , σ_{ij} , that is used to form the test statistic. Hence, for the three-day event window and with a sample size of N targets, the average abnormal return is $CAR_2(-1, 1) = (1/N) \sum_{i=1}^N 3\gamma_{2i}$, while the test-statistic $Z(CAR_2) = (1/\sqrt{N}) \sum_{i=1}^N (\gamma_{2i}/\sigma_{2i}) \sim N(0, 1)$ in large samples and if the N sample events are independent and the true parameters γ_{2i} and σ_{i2} are replaced by their OLS estimates.

²⁴As discussed in the literature (see Eckbo, Malenko, and Thorburn, 2025, for a recent review), a negative short-term bidder announcement return has several possible interpretations—ranging from an adverse-selection adjustment of the bidder’s stand-alone value, to merger arbitrage activity involving short-selling of bidder shares.

²⁵While the SEC filings detailing the merger history (described in Section 2.1 above) are published some time after the deal-announcement date, market rumors and conference calls reveal such details about the deal early in the deal process

Proposition 3, which emphasizes the enhanced negative market reaction to bidders that select to initiate the deal process and pay with stock. We therefore investigate, in Table 12, the robustness of this finding using a cross-sectional regression with bidder announcement returns as dependent variable and where the right-hand side include the explanatory variables used earlier in Table 5 above. In Table 12, we also broaden the bidder event window to the five-day period (-1,3) and use the simple Market Model to generate abnormal performance. Moreover, as recommended by Eckbo, Maksimovic, and Williams (1990b), we add the inverse Mill’s ratio to control for the bidder’s potential use of private information to select the timing of the deal initiation. This ratio is estimated from a first-stage probit regression—based on the universe of Compustat firms—of being a bidder to a takeover transaction involving two public firms in the next year.

As in Table 5, Table 12 first shows the baseline regression results (columns 1 and 5), and next, the effect of adding the target information variables (columns 2 and 6). Moreover, also as Table 5, Table 12 shows in columns (3)-(4) and (7)-(8) the effect of conditioning on the bidder initiating the transaction, both alone as a dummy variable and after interacting this dummy with M/B and *All-Stock* in the group of control variables and with all of the Target Information Proxies.

Notice first that *Inverse Mill’s Ratio* is statistically insignificant and that the coefficients in columns (5)-(8) are similar to those in the columns (1)-(4). In other words, controlling for the extensive-margin probability of being involved in the type of takeover deals sampled here (where both firms are public) does not alter the conclusions. In line with the literature, acquirer returns are decreasing in the relative deal size and—consistent with the the average abnormal returns reported in Table 3 above—are on average lower for all-stock transactions. Announcement returns also tend to be lower for acquirers in the high-tech industry. The only significant information variable is the dummy for a recent SEO, which generates a negative coefficient. Most important, conditioning the bidder announcement returns on bidder initiation, and interacting the bidder-initiation dummy with the other variables, do *not* affect the coefficient estimates, which again fails to support the bidder opportunism hypothesis in Part (i) of Proposition 3.

(Dasgupta, Harford, Ma, Wang, and Xie, 2024).

5.3 Long-short portfolio returns by deal initiation

Part (ii) of Proposition 3 predicts that if bidders tend to initiate takeovers when their shares are overpriced, their stock prices should subsequently reverse. Although no objective standard exists for the appropriate horizon, it must be short enough for private information to retain economic relevance. Following convention in long-run portfolio estimation following corporate events, we use a three-calendar-year window and construct calendar-time portfolios of bidder firms, sorted by deal initiation and payment method. In this setting, bidder initiation serves as a proxy for potential overvaluation, and the test is whether bidder-initiated deals underperform those initiated by targets. Bidders enter the test portfolio in the month following the bid announcement and remain in the portfolio for 36 months or until delisting, whichever comes first. Abnormal returns are estimated as the constant term α in Eq. (11) above, without the event dummies and where the time index t now runs from the month of the first takeover announcement in the sample (1/2000) to the last (12/2020).

Panel A of Table 13 reports the performance estimate α for equal-weighted portfolios, while Panel B is based on value-weighted portfolios. Columns (1)–(3) are restricted to deals in which the consideration includes stock, while columns (4)–(6) are limited to all-cash bids. If bidder initiation reflects opportunism, we would expect estimates of α to be negative and statistically significant for bidder-initiated deals, particularly when the bidder uses stock. However, the results do not support this prediction. The estimated α for bidder-initiated deals is small and statistically insignificant when the bidder pays with stock (column 1) and positive when the bidder pays with cash (column 4 of Panel A). Most important, the intercept α is statistically insignificant for the two long-short portfolios (long bidder-initiated, short target-initiated) in columns 3 and 6. Overall, the results in Table 13 offer no evidence that bidder-initiated deals reflect opportunistic use of overvalued equity.

5.4 Sector-specific announcement returns

Finally, Part (iii) of Proposition 3 focuses on the potential for the deal announcements to contain economic information that is relevant not only for the deal partners but also for the bidder’s close industry peers. The hypothesis is that takeovers paid with bidder shares signal market overvaluation of also peer firms in the bidder’s main industry sector. The industry peers of an acquiring firm are the five firms with the highest Hoberg and Phillips (2016) industry-relatedness scores, elected from the intersection between the

full Compustat population of US-domiciled companies and the firms in the TNIC-3 industry classification. For these five peer firms, the announcement return is estimated after forming a portfolio of the five firms weighted by the industry-relatedness score.

The average $CAR(-1,1)$ to the peer-firm portfolios in Panel D of Table 11 fails to support also this opportunism hypothesis. Rather, a consistent interpretation is that these acquisitions on average signal increased demand for (and valuation of) some sector-specific resource. The signal may also be that one or more of the five peer firms themselves may be able to capture rents from engaging in future sector-specific synergistic takeover bids—an interesting topic for future research since the signal concerns the incentive to become a *bidder* rather than a target firm as is the focus of the “in play” hypothesis of Song and Walkling (2000).

For robustness, in Table 14 we expand the valuation effects of the takeover announcements for the bidder’s industry peers to also include event windows $(-1,3)$ and $(-1,6)$. Columns (1) and (2) labeled “All rivals” use the same set of rivals as in Panel D of Table 11 above. In columns (3) and (4), the five-firm portfolios under “Same 3-Digit SIC” further restricts the Compustat population to firms in the bidder’s 3-digit SIC industry, while in columns (5) and (6) the requirement is for the peers to be in the same 4-digit SIC industry. If the number of listed firms in a specific SIC industry is less than five (which happens only rarely in our sample), we use the actual number of listed peers (which happens rarely).

Panel A of Table 14 confirms the significance of the positive average five-firm portfolio return in all but column (6), where $CAR(-1,6)$ for this seven-day window becomes insignificant after requiring the peer-firm to also overlap with the bidder’s 4-digit SIC industry. In panels B and C, we gradually move towards the constraint imposed by bidder opportunism: Panel B requires bidder shares to be part of the deal payment, while Panel C also requires the cases in Panel B to be bidder-initiated. While the sample size is necessarily reduced by these additional restrictions, we can safely conclude that the peer-firm effect is not negative. In other words, there is no evidence that the bidder-initiated stock-financed takeovers in our sample signals to the bidders’ close industry peers that they are overvalued.

6 Further on impediments to successful opportunism

The above empirical evidence addressing propositions 1-3 leaves little if any support for bidder opportunism to be of a concern in our sample of takeovers between publicly traded companies. In this final

section, we briefly discuss additional issues and related evidence on the takeover process that further advances our understanding of how the nature of the synergy gains and the takeover process itself constrain the ability of one party to the deal from taking advantage of the other.

6.1 High degree of commonality of valuations

Without focusing on bidder opportunism, Gorbenko and Malenko (2024) model a bidder’s incentive to initiate a takeover process as a function of the degree of commonality of the synergy-value across bidders. To illustrate the concept of valuation commonality, suppose that each of two potential bidders $i \in \{1, 2\}$ receives a private signal s_i relevant to her valuation $v_i(s)$ of the target and potentially also to the rival bidder’s valuation $v_{-i}(s)$. Conditional on both signals, the value of the target to bidder i is $v_i(s) = \alpha s_i + (1 - \alpha) s_{-i}$, where s_{-i} is the signal of the rival bidder. The parameter α measures the degree of commonality of the respective valuations of the two bidders, with $\alpha = 1$ when valuations are purely private (zero commonality). Gorbenko and Malenko (2024) show that, when bidder valuations have a sufficiently high common component, no bidders approach the seller in equilibrium (the target then initiates to alleviate its own cash constraint). At the other extreme, with pure private values, potential rival bidders do not learn from any one bidder’s initiation decision, and a bidder can safely initiate without risking losing informational rents to its rivals (while still strategically time the initiation decision to maximize those rents).

Since the degree of commonality in valuations is unobservable to the econometrician, empirically judging the impact of common values on auction outcomes is difficult. However, the literature provides some insights into this latent variable. One strategy is to differentiate between financial and strategic (industrial) bidders (Martos-Vila, Rhodes-Kropf, and Harford, 2013; Gorbenko and Malenko, 2014). The idea is that, while financial bidders may be less able to generate unique synergy gains, strategic bidders integrate the target into their potentially unique operations. At the end of each of the two panels in Table 2, we show the auction statistics when the winning bidder is financial. In Panel A, which includes both public and private bidders, the percent financial winners is 24%, compared to the 4% in Panel B where all bidders are public. This difference is not unexpected since relatively few financial bidders are publicly traded.

Perhaps more important, when a financial bidder wins, there is no difference in the fractions of the deals that were bidder- or target-initiated, respectively. In other words, whether the bidder is public

of private, the prevalence of winning financial bidders does not differ significantly across the initiation types (bidder or target). This is interesting since the synergy gains driving financial bidders are likely to have a greater common-value component across bidders than the case if for industrial buyers (Gorbenko and Malenko, 2014). The information in Table 2 indicates that this likely difference does not, however, impact whether the financial bidder wins the auction in either bidder-initiated or target-initiated deals. Moreover, in Table 15, we compare the payment method and offer premium between financial and non-financial public bidders. As expected, financial bidders are significantly less likely to use stock. More surprising, there is no significant difference in the offer premium across the two categories of bidders: the average (median) is approximately 50% (34%) for both.

Another approach to address the issue of commonality in valuations across potential bidders is to focus on the speed with which rival bidders enter following the first bid. Presumably, if the first bid strongly signals the presence of a valuable takeover opportunity also for other potential bidders, it cuts down on the time it takes for those rivals to prepare a bid and enter the auction. Betton and Eckbo (2000) document that, when a second (rival) bidder appears in the takeover auction, this entry occurs on average as quickly as within two weeks of the first public offer (their Figure 2). This may indicate a certain degree of commonality in rival bidder valuations, unless private noncommittal bidding rounds prior to the first public bid give rival bidders sufficient time to figure out their own private valuations of the target.

A third empirical approach to the issue of judging the uniqueness of bidder synergies is found in Dessaint, Eckbo, and Golubov (2025). They show that average acquirer returns over the past four decades, while largely constant, mask fundamental changes in its two basic components. The first component is bidder-specific, which they identify as bidder fixed effects, and the second is common across bidders. They show that controlling for bidder composition, the common component of acquirer returns has increased by five percentage points relative to the 1980s. Offsetting this increase, the average bidder-specific component has declined. They propose a simple theory of bidder-specific synergies to help interpret these opposing trends. Both in this theory and in the data, acquirer returns increase with the extent to which synergies are unique to that bidder (the composition effect reflects bidder uniqueness). Overall, their evidence is consistent with rising merger synergies that have become less bidder specific. It is possible that this evolution may reflect an increased involvement of investment banks, who routinely keep their clients updated about the potential for target investment opportunities. Such updates may also shorten the

reaction time of potential rival bidders.

6.2 Informed institutional target shareholders

Our empirical tests in Section 3 use empirical proxies for how much the target knows about the bidder firm’s true valuation to infer the target’s perceived risk of bidder opportunism. These proxies include the degree of operating and product similarities across the bidder and targets, geographical closeness, as well as recent information disclosures concerning SEOs and acquisition activity by the bidder, which produce high-level firm-specific information. There are other complementary information channels that may influence the target’s confidence in their valuation of the bidder shares. While they do not condition on the party that initiates the deal, Kim, Luu, and Xu (2025) introduces one such channel: the fraction of the target firm owned by (presumably well-informed) institutional investors. The idea is that, whatever the information about the bidder that is available to target shareholders (who will vote on the deal), institutional investors may be better than retail investors at evaluating that information. Hence, rational bidders may factor in the target’s institutional ownership when considering the expected value of an opportunistic bid strategy. They use a sample of 3,236 M&A transactions where both the bidder and target are public firms, and also condition their analysis on information variables related to those in Eckbo, Makaew, and Thorburn (2018). As predicted by rational payment design—and inconsistent with bidder opportunism—they find that institutional ownership of targets is associated with an increase in both the likelihood of receiving stock-based offers and the fraction of stocks in the merger payment.

6.3 Deal-driven bidder CEO compensation changes

Shleifer and Vishny (2003) brought early attention to the potential for bidder opportunism in takeovers by suggesting that agency frictions on the target side of the deal may allow bidder opportunism to succeed: target managers may find it in their personal interest to knowingly accept overpriced bidder shares. Empirical research has examined one such potential agency channel—the incentive effect of the fact that a takeover causes immediate vesting of the target management’s unvested compensation—without finding supporting evidence (Fidrmuc and Xia, 2019; Eckbo, Norli, and Thorburn, 2023). While agency frictions remain an interesting avenue in the context of opportunism,²⁶ Barger and Denis (2025) further show

²⁶See, e.g., Edmans et al. (2012a) for a dynamic compensation plan that fully aligns the interests of managers and shareholders. Baker, Ruback, and Wurgler (2007) review the literature on the potential for agency frictions and psychological biases to influence corporate investments and financing decisions.

that CEO compensation increases following acquisitions only in those deals in which acquirer stock is used as the method of payment. These compensation increases are driven by increases in equity-based compensation, and are concentrated in riskier acquirers, riskier acquisitions, and in acquirers whose CEOs have low exposure to the stock price. They find little support for traditional agency cost explanations of changes in CEO pay following acquisitions. Instead, they conclude that the findings are broadly consistent with compensation changes representing a contracting solution to a two-sided adverse selection problem that is present only in stock-for-stock acquisitions. Hence, their evidence further supports our contracting Proposition 1 (rational payment design) that we describe test in Section 3 above.

Acquiring firm executives with private information that their shares are temporarily overpriced may also have an incentive to (legally) sell the shares in the open market if they are still overpriced following deal completion. Interestingly, Chen, Fidrmuch, Leia, and Xiac (2025), who study this type of anonymous insider trading following 944 takeovers by publicly listed US acquirers (2005–2018) conclude that acquirer insiders *increase* rather than decrease their net purchases—particularly in stock payment deals. They also find that acquirers with a higher increase in insider net purchases exhibit better (not worse) long-term stock and operating performance. This evidence on anonymous insider trading further contradicts the hypothesis that acquirers opportunistically use overpriced shares as their acquisition currency.²⁷

6.4 Legal and contractual constraints

Finally, since legal and contractual constraints are designed to minimize information asymmetries between the two parties, they also lower the expected value of opportunism. For example, mandatory disclosure rules, such as the federal Williams Act of 1968 and its 1970 Amendment, provide the target with time and information to evaluate competing bids (Jarrell and Bradley, 1980).²⁸ Moreover, the so-called Revlon duty from 1986 requires target boards to protect their shareholder by selling to the highest bidder (Gilson and Kraakman, 1990).²⁹ As first shown by Betton and Eckbo (2000) and Boone and Mulherin (2007b), and also confirmed by our Table 2 above, both the public and private phases of the typical sales process

²⁷The net purchase activity also suggests that the acquirer insiders are not particularly concerned with the (average) negative market reaction to stock-financed acquisition announcements, perhaps because that negative reaction primarily reflects short-selling pressures. See also Golubov, Petmezas, and Travlos (2016).

²⁸Pub. L. No. 90-439, 82 Stat. 454 (July 29, 1969) and Pub. L. No. 91-567, 84 stat. 1497 (December 22, 1970)).

²⁹Revlon v. MacAndrews and Forbes Holdings, 506 A.2d 173 (Del 1986). This duty arises when the actions of the target board indicate that it has abandoned a strategy of operating as a stand-alone company.

attract multiple bids.³⁰

Moreover, the risk of rival bidders free-riding on the initiation decision motivates several deal protection devices in merger contracts, such as confidentiality agreement, stand-still and non-compete provisions, breakup fees, insiders’ tender-precommitment, material adverse conditions (MAC) clauses, drop-dead dates that restricts the negotiation period, and no-shop provisions that discourage the target from soliciting additional offers (for an auction-theoretic analysis of the alternative go-shop provisions, see Chen and Wang, 2023). Note also that a strategy of purchasing target shares (a toehold) in the open market prior to initiating a takeover bid may help to protect the bidder’s first-mover advantage (Betton, Eckbo, and Thorburn, 2009).

7 Conclusion

A bidder who self-selects the time to initiate a takeover process may try to opportunistically pay for the target with overpriced shares. We examine this possibility against the alternative that the bidder selects to use its shares rather than cash as acquisition currency in response to the expected overpayment cost of target adverse selection. Ours is the first empirical analysis to condition the treatment effects of this payment method choice on whether the takeover is bidder- rather than target-initiated. Just as in studies of insider trading more generally, this conditioning increases power to test whether bidders use private information about (temporary) market mispricing when offering to pay for the target in shares.

We apply our unique conditioning information to three propositions with different empirical predictions emanating from the bidder and target being asymmetrically informed about the counterpart’s true value. In the first and most general proposition (Proposition 1), we ask whether targets who are relatively uninformed about the bidder tend to attract bidder-initiated stock-financed bids. If anything, the evidence shows the opposite effect as the likelihood of a bid being stock-financed (fully or partially) *decreases* in proxies for the target’s information about the bidder. Moreover, this negative effect of the information proxies does not interact with the takeover being bidder-initiated.

Second, in Proposition 2, we condition the structural estimation of the rational equilibrium model of Li, Taylor, and Wang (2018) on the party initiating the deal. While the deal initiation decision

³⁰Hansen (2001) suggests that the the bids in the private phase may help the target set a reserve price for a final public bidding round. Betton, Eckbo, and Thorburn (2009) and Chen and Wang (2023) model the “shadow” auction that exist in the period between the signing of a negotiated merger agreement and the target shareholder vote on that agreement.

is exogenous to their model, we treat this decision as a rational side-bet on an otherwise synergistic takeover opportunity where the target may unknowingly accept overpriced bidder shares. In their model, if bidders have private information about market overvaluation, then the data and model moments in bidder-initiated deals should reflect a relatively high likelihood of bidder opportunism than in target-initiated deals. Instead, we find that the percent inefficient deal outcomes (the percent of the cases where the overvalued bidder wins the target) is only about 6% *regardless* of whether the deal is bidder- or target-initiated.

Third, in Proposition 3, we condition the market pricing of the bidder and target firms on the deal initiation decision. We first confirm that the takeover deals in our sample are on average synergistic (not zero-sum games)—a necessary condition for deals among rational agents to include opportunistic side bets. Second, there is no evidence of non-zero long-run risk-adjusted excess stock returns for either bidder-initiated or target-initiated deals. Surprisingly, we show that bidder-initiated deals on average cause investors to increase the market value of the bidder’s *close industry peers* by a statistically significant average 0.7% for both bidder- and target-initiated transactions. In other words, rather than signaling to investors that the bidder’s industry sector may be overpriced, it appears that the market draws the opposite inference—e.g., increased demand for a sector-wide resource triggered by news of the synergistic takeover.

In sum, our multifaceted transaction-based evidence fails to support the notion that information asymmetries between the trading parties cause bidder opportunism should be a concern in takeovers between publicly traded US firms. Rather, the explanation consistent with the bulk of the evidence is that the takeover process itself deters bidders from timing the deal process so as to swap overpriced bidder shares for the target. This deterrent effect is most likely the result of regulatory (disclosure-related) constraints, contractual issues, and the nature of the source of synergy gains, all of which help the target to substantially reverse-engineer bidder mispricing (if any) during the extensive deal process.

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Figure 1
Annual sample distribution classified by the initiating party to the deal, 2000-2020

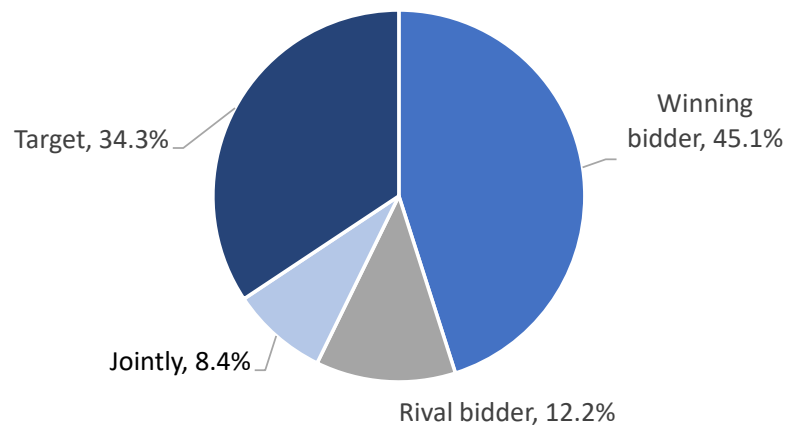
The sample comprises 2,968 completed takeovers of US public targets by US bidders, 2000–2020.



Figure 2
Sample proportions classified by the party that initiates the takeover process

The figure shows the sample proportions by deal initiation for the full sample of 2,968 public and private bidders (Panel A) and the subsample of 1,845 publicly traded bidders (Panel B). Deals can be initiated by the winning bidder, a rival bidder, the target firm, or the target and the bidder jointly. The sample consists of completed takeovers of US public targets by US bidders, 2000–2020.

Panel A: Full sample of public and private bidders (N=2,968)



Panel B: Subsample of public bidders (N=1,845)

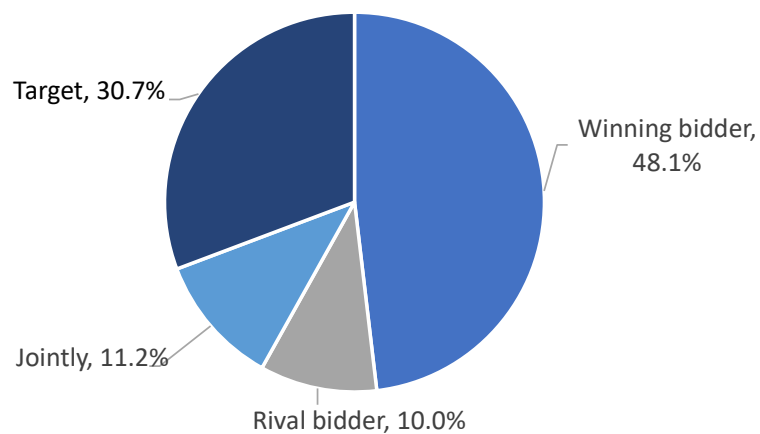


Figure 3
Average market to book, 2000-2020

The figure reports annual average market-to-book ratios (M/B) from 2000 to 2020 for four groups of Compustat firms: all firms, high-tech firms, bidders, and high-tech bidders. Across the full sample period, the mean M/B is 2.4 for all firms and 3.9 for all bidders. Among high-tech firms, the corresponding averages are 3.3 and 5.1, respectively.

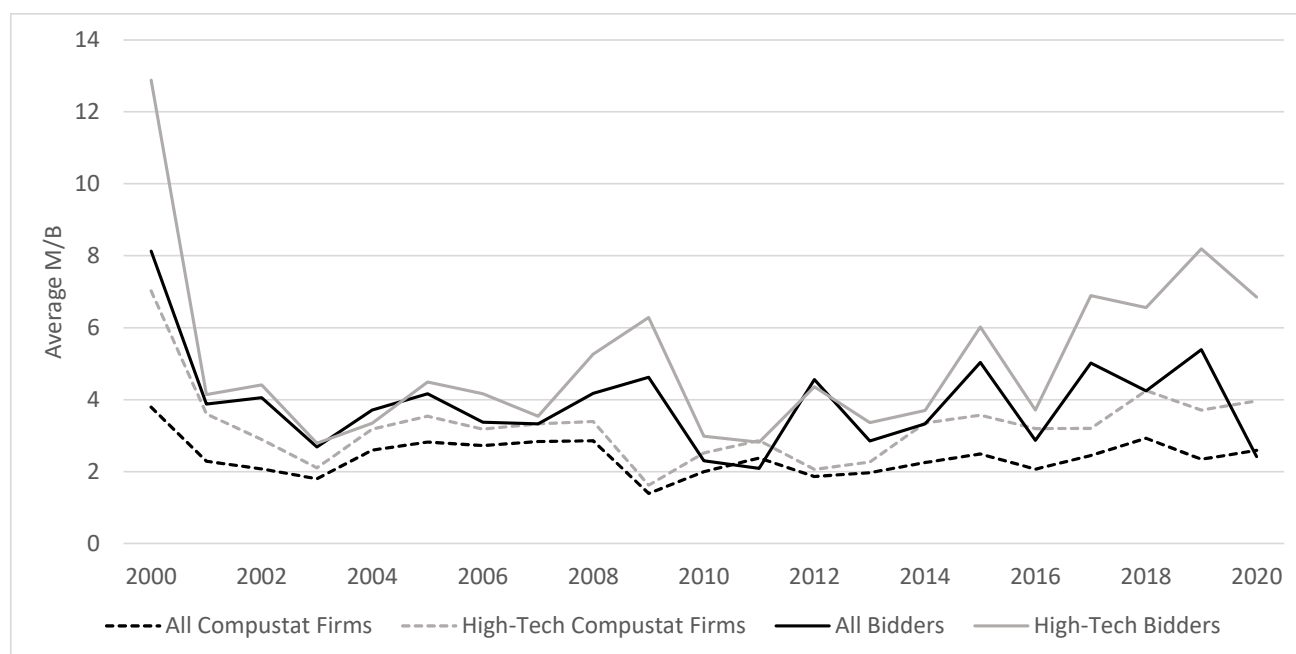


Figure 4
Median bidder M/B to target M/B, 2000-2020

The figure reports annual median ratios of bidder M/B to target M/B from 2000 to 2020, split by bidder-initiated and target-initiated deals. The sample includes 1,845 bids for U.S. public targets by U.S. public bidders. Over the full sample period, the annual median ratio averages 1.19 for bidder-initiated deals and 1.23 for target-initiated deals.

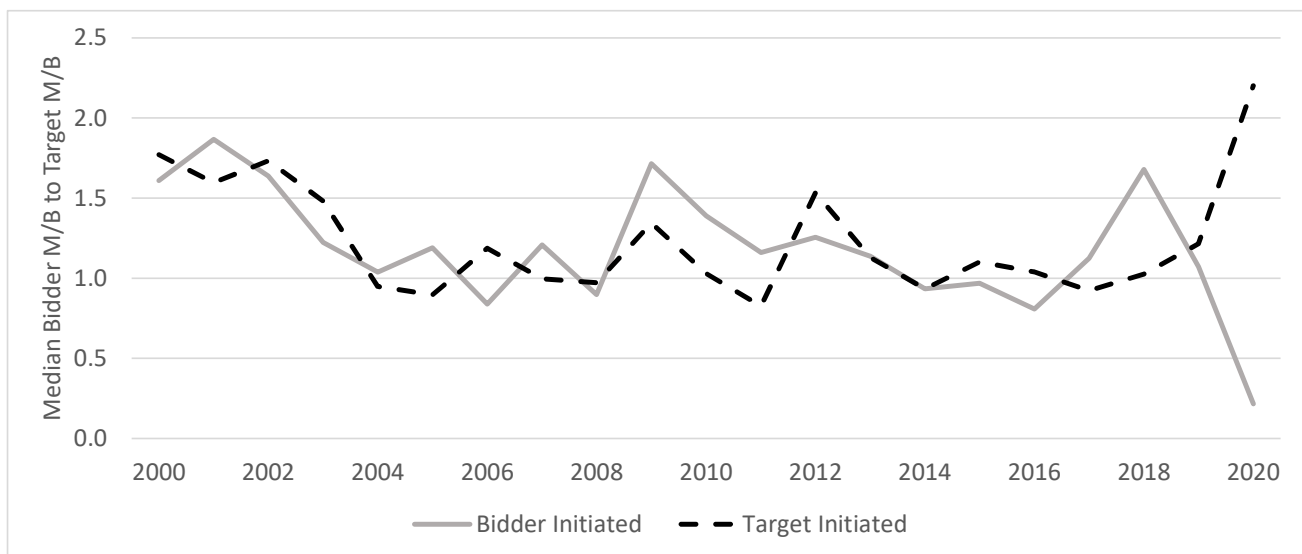
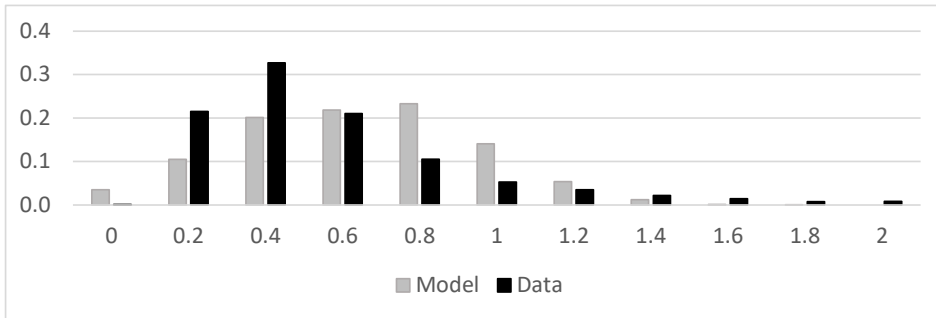


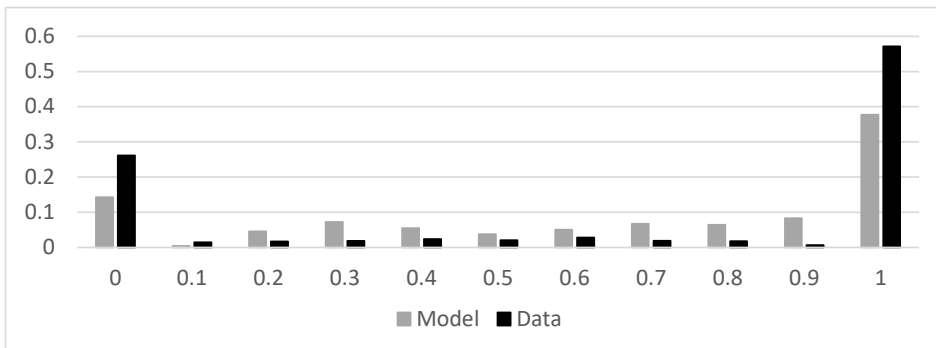
Figure 5
Simulated and empirical distributions

The figure plots the distributions of the offer premium, the fraction of cash in the bid, and the acquirer announcement return in the data and in the model.

Panel A: Offer premium



Panel B: Fraction of cash in the bid



Panel C: Acquirer announcement CAR

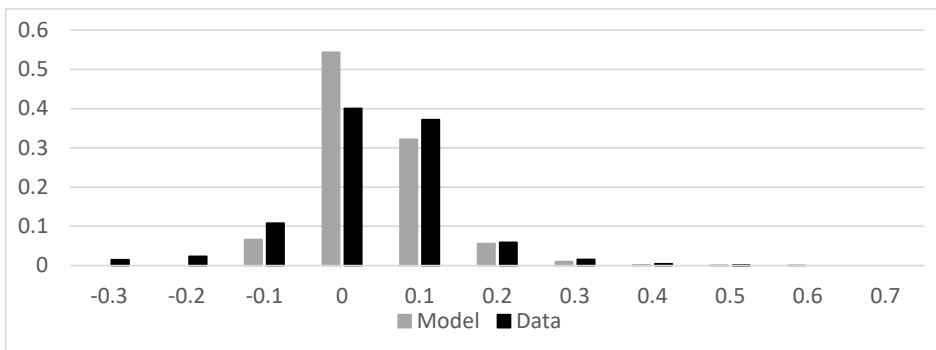
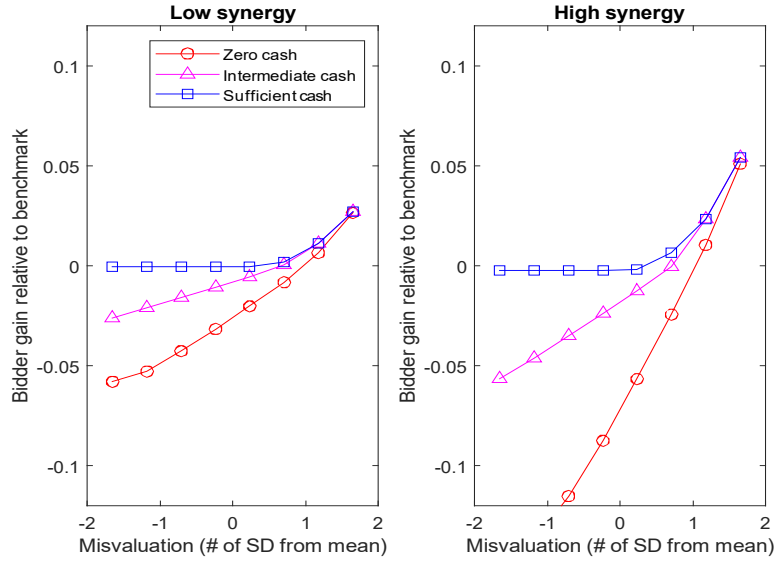


Figure 6
Simulated redistribution effects

The figure shows the redistribution effect (the effect of misvaluation on a bidder's takeover gains), defined as the difference in bidder gains between the estimated (with misvaluation) and counterfactual (without misvaluation) economy. The sample is split by deals initiated by the bidder (Panel A) and target (Panel B), and by low-synergy (left graph) and high-synergy (right graph) bidders. Each graph shows the effect for bidders with zero, intermediate, and sufficient cash holdings, who can pay, respectively, 0%, 50% and 100% of the offer price in cash. Each curve describes how the redistribution effect varies with bidder i 's misvaluation, *ceteris paribus*. A bidder's misvaluation ϵ_1 (x-axis) is measured as the number of standard deviations from the sample mean.

Panel A: Bidder-initiated deals



Panel B: Target-initiated deals

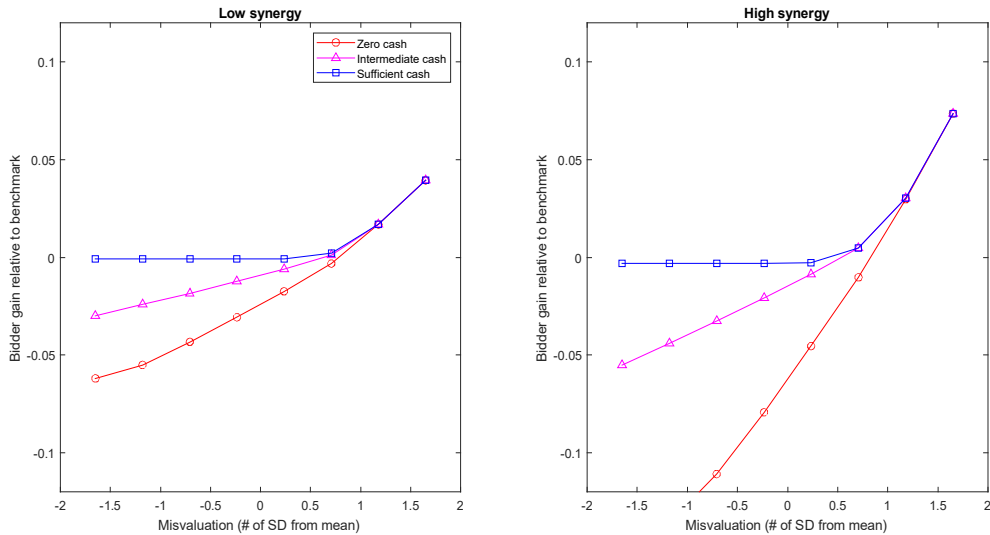


Figure 7
Median bidder to target cash ratio, 2000-2020

The figure presents annual median cash-to-total-asset ratios for bidders over the period 2000–2020, separately for bidder-initiated and target-initiated transactions. The sample comprises 1,845 acquisitions of U.S. public targets by U.S. public bidders. Across the full sample period, the average annual median is 8.6% for bidder-initiated deals and 8.4% for target-initiated deals.

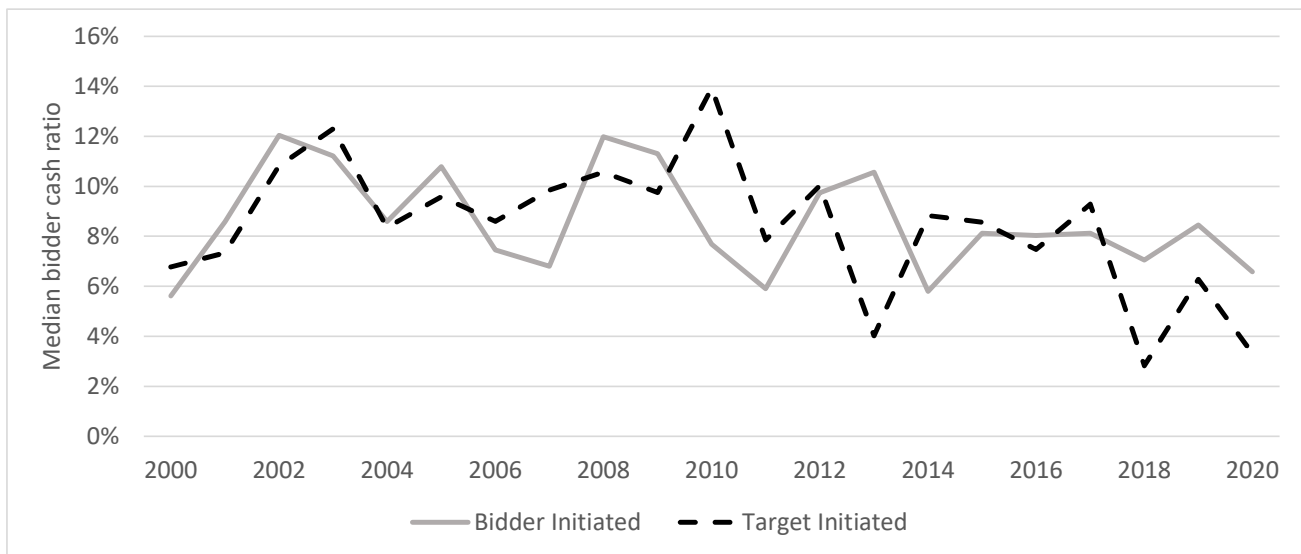


Table 1
Bidder and target characteristics by initiation

The table reports mean and median bidder and target characteristics in Panels A and B, respectively. Columns 1-3 use the full sample, while columns 4-6 limit the sample to bidder-initiated deals, and columns 7-9 to target-initiated deals. Columns 10 and 11 report the difference in mean (column 5 vs. 8) and its significance, respectively. The sample comprises completed takeovers of US public targets by US public bidders, 2000-2020. All variables are defined in Table 4. ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively.

Variable	Full Sample			Bidder-Initiated			Target-Initiated			Bidder-Target Init.	
	N (1)	Mean (2)	Median (3)	N (4)	Mean (5)	Median (6)	N (7)	Mean (8)	Median (9)	Δ Mean (10)	t-stat. (11)
Panel A: Public bidder characteristics											
Total Assets	1,574	13,190	2,581	926	15,264	3,526	648	10,227	1,548	5,037	(4.17)***
Leverage	1,543	0.11	0.12	907	0.12	0.12	636	0.11	0.12	0.00	(0.26)
Cash Holding	1,551	0.13	0.08	913	0.13	0.08	638	0.14	0.08	-0.01	(1.66)*
M/B	1,545	4.23	2.71	911	4.19	2.79	634	4.28	2.64	-0.09	(0.25)
Dividend Dummy	1,575	0.48	0.00	926	0.51	1.00	649	0.44	0.00	0.07	(2.62)***
R&D	1,575	0.05	0.02	926	0.05	0.02	649	0.06	0.02	-0.01	(1.93)*
Asset Tangibility	1,564	0.44	0.30	920	0.43	0.30	644	0.45	0.30	-0.02	(1.17)
Operating Efficiency	1,370	1.94	1.39	802	1.94	1.38	568	1.93	1.42	0.01	(0.02)
Panel B: Target characteristics (of public bidders)											
Total Assets	1,430	1,924	258	835	2,139	337	595	1,622	170	517	(1.64)
Leverage	1,414	0.04	0.00	823	0.03	0.00	591	0.04	0.01	0.00	(0.21)
Cash Holding	1,422	0.18	0.12	827	0.18	0.12	595	0.18	0.11	0.00	(0.30)
Market to Book Equity	1,405	2.86	2.00	823	2.99	2.14	582	2.67	1.87	0.33	(1.05)
Dividend Dummy	1,432	0.29	0.00	835	0.29	0.00	597	0.29	0.00	0.00	(0.08)
R&D	1,432	0.09	0.02	835	0.09	0.02	597	0.09	0.02	0.00	(0.36)
Asset Tangibility	1,418	0.46	0.31	829	0.46	0.30	589	0.48	0.34	-0.02	(0.84)
Operating Efficiency	1,243	1.99	1.60	725	1.90	1.52	518	2.13	1.77	-0.23	(0.51)

Table 2
Auction characteristics

The table reports mean and median characteristics of the auction process, split by bidder-initiated and target-initiated deals. Panel A shows the full sample of 2,971 successful acquisitions of publicly listed targets by US-domiciled bidders in manufacturing industries from 2000 through 2020. Panel B shows the subsample of 1,845 takeovers by public bidders. “(d)” indicates a binary variable, while ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively.

Variable	Full Sample			Bidder-Initiated			Target-Initiated			Bidder-Target Init.	
	N (1)	Mean (2)	Median (3)	N (4)	Mean (5)	Median (6)	N (7)	Mean (8)	Median (9)	Δ Mean (10)	t-stat. (11)
Panel A: Full sample of public and private bidders											
No. of Bids	2,968	4.16	3	1,699	4.26	4	1,269	4.03	3	0.23	(1.80)*
Multiple Bids (d)	2,968	0.80	1	1,699	0.84	1	1,269	0.75	1	0.10	(6.61)***
No. of Written Bids	2,968	2.23	1	1,699	2.22	1	1,269	2.25	1	-0.03	(0.32)
Multiple Written Bids (d)	2,968	0.48	0	1,699	0.49	0	1,269	0.47	0	0.02	(0.99)
No. of Unique Bidders	2,968	2.06	1	1,699	2.02	1	1,269	2.11	1	-0.09	(1.21)
Multiple Bidders (d)	2,968	0.40	0	1,699	0.40	0	1,269	0.40	0	0.00	(0.17)
No. of Financial Bidders	2,968	0.52	0	1,699	0.51	0	1,269	0.55	0	-0.04	(0.77)
Duration (days)	2,968	210.88	163	1,699	206.72	159	1,269	216.45	168	-9.74	(1.51)
Average Bid Jump (%)	2,057	4.07	2.28	1,268	4.37	2.62	789	3.57	1.86	0.80	(2.12)**
Fraction Stock Payment	2,798	0.27	0	1,612	0.24	0	1,186	0.31	0	-0.07	(4.53)***
All-Stock Payment (d)	2,968	0.15	0	1,699	0.12	0	1,269	0.19	0	-0.06	(4.82)***
Offer premium (one month)	2,805	52.56	33.63	1,624	61.69	36.07	1,181	40.01	29.46	21.69	(2.39)**
Financial Bidder Won Indicator	2,986	0.24	0.00	1,699	0.23	0.00	1,181	0.25	0.00	-0.02	(1.18)
Panel B: Subsample of public bidders											
No. of Bids	1,845	3.46	3	1,072	3.69	3	773	3.14	3	0.55	(3.85)***
Multiple Bids (d)	1,845	0.74	1	1,072	0.80	1	773	0.65	1	0.15	(7.33)***
No. of Written Bids	1,845	1.76	1	1,072	1.81	1	773	1.70	1	0.11	(1.00)
Multiple Written Bids (d)	1,845	0.40	0	1,072	0.42	0	773	0.38	0	0.04	(1.59)
No. of Unique Bidders	1,845	1.72	1	1,072	1.76	1	773	1.68	1	0.08	(1.06)
Multiple Bidders (d)	1,845	0.31	0	1,072	0.33	0	773	0.29	0	0.04	(1.70)*
No. of Financial Bidders	1,845	0.14	0	1,072	0.14	0	773	0.14	0	0.00	(0.06)
Duration (days)	1,845	196.08	146	1,072	191.77	140	773	202.06	153	-10.29	(1.28)
Average Bid Jump (%)	1,079	4.72	2.87	714	4.90	3.07	365	4.35	2.58	0.60	(1.06)
Fraction Stock Payment	1,753	0.41	0.26	1,023	0.36	0.00	730	0.49	0.48	-0.13	(6.02)***
All-Stock Payment (d)	1,845	0.24	0	1,072	0.19	0	773	0.30	0	-0.11	(5.74)***
Offer premium (one month)	1,737	50.52	34.22	1,025	58.07	36.92	712	39.65	28.37	18.42	(2.22)**
Financial Bidder Won Indicator	1,845	0.04	0.00	1,072	0.03	0.00	773	0.04	0.00	-0.01	(0.77)

Table 3
Univariate stock payment and initiation

The table reports the coefficient estimates from probit regression for the likelihood of an all-stock bid (columns 1-3) and Tobit regressions for the fraction of stock in the deal payment (columns 4-6). The explanatory variables are a dummy indicating that the deal is bidder-initiated and an intercept (not tabulated). Columns (1) and (4) use the full sample. Columns (2) and (5) restrict the sample to bidder- and target-initiated deals, and columns (3) and (6) to bidder- and jointly-initiated deals. The sample comprises completed takeovers of US public targets by US public bidders between 2000 and 2020. t-values are in brackets. ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively.

	Probit (y = All-stock)			Tobit (y = Fraction of stock)		
	All deals (1)	Bidder and target init. (2)	Bidder and jointly init. (3)	All Deals (4)	Bidder and target init. (5)	Bidder and jointly init. (6)
Bidder Initiated	-0.367 (5.66)***	-0.152 (2.08)**	-0.875 (8.93)***	-0.478 (5.67)***	-0.178 (1.95)*	-1.179 (9.13)***
Pseudo R-squared	0.02	0.00	0.06	0.01	0.00	0.04
N	1,845	1,639	1,278	1,753	1,552	1,224

Table 4
Variable definitions

Variable name	Variable definition and data source
<u>Deal characteristics</u>	
<i>Large Deal</i>	Dummy = 1 if the ratio (deal value/bidder total assets) is in the top quartile, SDC.
<i>All-Stock</i>	All-stock payment (consideration structure = shares), SDC.
<i>Bidder-Initiated</i>	Dummy = 1 if the bidder initiated the takeover, SDC.
<u>Bidder capital structure</u>	
<i>Size</i>	Natural log of total assets, Compustat.
<i>Leverage</i>	Total debt / total assets, Compustat.
<i>Cash Holding</i>	Cash / total assets, Compustat.
<i>M/B</i>	Market-to-book equity ratio = (year-end closing price * number of shares outstanding) / (total assets - total liabilities), Compustat.
<i>Dividend Dummy</i>	Dummy = 1 if total dividends > 0, Compustat.
<i>R&D</i>	Research and development expense / total assets, Compustat.
<i>Asset Tangibility</i>	Property, plant, and equipment / total assets, Compustat.
<i>Operating Efficiency</i>	(Cost of goods sold + selling, general and administrative expense) / (property, plant, and equipment + total current assets - cash - total current liabilities), Compustat.
<u>Target's information about bidder value</u>	
<i>Local Deal</i>	Dummy = 1 if the bidder and the target are located within 30 miles. The distance is computed using the spherical law of cosines formula: $\text{Distance} = \arccos(\sin(\text{lat1}) \cdot \sin(\text{lat2}) + \cos(\text{lat1}) \cdot \cos(\text{lat2}) \cdot \cos(\text{long2} - \text{long1}))$, where R = radius of the earth = 3963 miles, (lat1, long1) = bidder coordinate (latitude, longitude) in radians, and (lat2, long2) = target coordinate in radians. Firm location data are from the zip codes in SDC and their coordinates (lat, long) are from 1987 US Census Gazetteer Files.
<i>H-P Industry Relatedness</i>	Measure based on the TNIC-3 industry classification from Hoberg and Phillips (2016). The TNIC-3 database provides a firm-by-firm pairwise similarity score based on product descriptions from the firm 10Ks. The database covers firm pairs whose score is above a threshold matching the coarseness of three-digit SIC. We assign the relatedness score of zero to firm pairs that are not in the TNIC-3 database.
<i>Recent SEO</i>	Dummy = 1 if the bidder issued stock within 18 months prior to the bid, SDC.
<i>Recent Acquirer</i>	Dummy = 1 if the bidder announced another merger bid within 18 months before the sample bid, SDC.
<u>Target industry characteristics</u>	
<i>Private Bidder Competition</i>	Fraction of all merger bids in the target's Fama and French 49 (FF49) industry and year in which the bidder is private, SDC.
<i>High-Tech Dummy</i>	Dummy = 1 if the bidder is in a high-tech industry covering 47 four-digit Standard Industrial Classification (SIC) codes in the two-digit industries 28, 35, 36, 38, 48, and 73, American Electronic Association.

Table 5
Determinants of stock consideration conditional on target information proxies and bidder-initiation

The table reports the coefficient estimates from probit regressions for the likelihood of all-stock payment (columns 1-4) and Tobit regressions for the fraction of stock (columns 5-8). Columns 1 and 5 show the baseline regressions, columns 2 and 6 add information variables, and the remaining add bidder initiation. The sample comprises completed takeovers of US public targets by US public bidders, 2000–2020. All variables are defined in Table 4. An intercept is included but not reported. t-values are in brackets. ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively.

Variable	Probit (y = all-stock)				Tobit (y = fraction of stock)			
	Baseline (1)	Information (2)	Initiation (3)	Interaction (4)	Baseline (5)	Information (6)	Initiation (7)	Interaction (8)
<u>Controls</u>								
Size	-0.181 (7.38)***	-0.195 (7.36)***	-0.186 (6.95)***	-0.188 (6.99)***	-0.233 (8.30)***	-0.248 (8.39)***	-0.240 (8.04)***	-0.242 (8.09)***
Large Deal	0.220 (2.41)**	0.174 (1.89)*	0.174 (1.88)*	0.174 (1.89)*	0.660 (7.07)***	0.596 (6.52)***	0.596 (6.54)***	0.594 (6.56)***
Leverage	0.037 (0.25)	0.006 (0.04)	-0.011 (0.08)	-0.019 (0.13)	0.117 (0.65)	0.065 (0.37)	0.057 (0.32)	0.053 (0.30)
Cash Holding	0.241 (0.64)	0.117 (0.31)	0.114 (0.30)	0.092 (0.24)	0.269 (0.64)	0.083 (0.20)	0.090 (0.22)	0.065 (0.15)
M/B	0.014 (2.59)***	0.015 (2.60)***	0.015 (2.61)***	0.005 (0.63)	0.011 (1.71)*	0.011 (1.71)*	0.011 (1.70)*	-0.002 (0.14)
M/B x Bidder Initiated				0.018 (1.59)				0.02 (1.58)
Dividend Dummy	0.025 (0.26)	0.061 (0.64)	0.058 (0.60)	0.057 (0.59)	-0.092 (0.93)	-0.056 (0.58)	-0.060 (0.61)	-0.065 (0.66)
R&D	0.629 (1.09)	0.503 (0.89)	0.458 (0.81)	0.487 (0.87)	0.604 (0.94)	0.385 (0.62)	0.333 (0.54)	0.348 (0.57)
Asset Tangibility	0.159 (1.43)	0.139 (1.23)	0.125 (1.09)	0.128 (1.13)	0.540 (4.83)***	0.500 (4.49)***	0.487 (4.38)***	0.494 (4.45)***
Operating Efficiency	0.001 (0.15)	0.001 (0.13)	0.001 (0.14)	0.002 (0.23)	0.001 (0.12)	0.001 (0.18)	0.001 (0.21)	0.003 (0.37)
High-Tech Dummy	-0.117 (1.17)	-0.085 (0.83)	-0.086 (0.84)	-0.093 (0.91)	-0.204 (1.96)**	-0.161 (1.55)	-0.162 (1.57)	-0.165 (1.59)
Private Bidder Competition	-0.736 (2.62)***	-0.682 (2.41)**	-0.673 (2.37)**	-0.9 (2.02)**	-0.835 (2.96)***	-0.753 (2.70)***	-0.747 (2.68)***	-0.737 (1.55)
Priv. Bid. Comp. x Bidder-Ini.				0.402 (0.70)				-0.029 (0.05)
<u>Target information proxies</u>								
Bidder Initiated			-0.202 (2.45)**	-0.362 (2.31)**			-0.161 (1.89)*	-0.255 (1.51)
Local Deal		0.325 (2.93)***	0.328 (2.94)***	0.258 (1.52)		0.338 (2.86)***	0.338 (2.86)***	0.189 (0.99)
Local Deal x Bidder Ini.				0.134 (0.60)				0.257 (1.07)
H-P Industry Relatedness		0.856 (2.07)**	0.888 (2.13)**	0.597 (1.00)		2.000 (4.66)***	2.010 (4.67)***	1.500 (2.25)**
H-P Industry Rel. x Bidder Ini.				0.460 (0.56)				0.746 (0.87)
Recent SEO		0.205 (2.36)**	0.210 (2.41)**	0.216 (1.65)*		0.288 (3.25)***	0.287 (3.24)***	0.355 (2.49)**
Recent SEO x Bidder Initiated				-0.008 (0.05)				-0.111 (0.64)
Recent Acquirer		-0.046 (0.37)	-0.047 (0.37)	0.003 (0.01)		0.031 (0.25)	0.031 (0.26)	0.029 (0.15)
Recent Acquirer x Bidder Ini.				-0.1 (0.42)				0.001 (0.01)
Pseudo R-squared	0.10	0.11	0.12	0.12	0.10	0.12	0.12	0.12
N	1,349	1,341	1,341	1,341	1,285	1,277	1,277	1,277

Table 6
Steps in the structural estimation

I. Identify the eight targeted moments in the SMM estimation:

(1) Parameters: $\Theta = (\mu_s, \sigma_s, \mu_e, \sigma_e, \mu_k, \sigma_k, \rho_{sM}, \rho_{kM})$, where $s \sim N(\mu_s, \sigma_s^2)$; $e \sim N(\mu_e, \sigma_e^2)$; $k \sim N(\mu_k, \sigma_k^2)$.

Three synergy parameters: $\mu_s, \sigma_s, \rho_{sM}$, identified from the mean and variance of the offer premium (OP) and the regression parameter a_1 from the regression: $OP_i = a_0 + a_1 \log(M_i) + a_2 Controls_i + u_i$, where $Controls$ contains year FE, Fama-French-49 FE, target size, leverage, M/B, ROA, cash/assets.^b

Two misvaluation parameters: μ_e, ρ_e , identified from average bidder announcement returns [$CAR(-1, 3)$] and the regression parameter b_1 from $CAR(-1, 3)_i = b_0 + b_1 \log(M_i) + b_2 Controls_i + b_3 FractionCash_i + \nu_i$.^c

Three cash-constraint parameters: $\mu_k, \sigma_k, \rho_{kM}$, identified from the mean and variance of fraction bidder's cash holding ($Cash$) and the regression parameter c_1 from $Cash_i = c_0 + c_1 \log(M_i) + b_2 Controls_i + w_i$.

II. Match simulated moments to the data moments:

(2) Form $L = 20$ simulated samples (to be conservative), each with a number of draws equal to (up to) 10 times the total sample of 1,845 takeovers with publicly listed bidders and targets.^d In the l 'th simulated sample, form the vector $\hat{m}^l(\Theta)$ of the simulated moments.^e

(3) In each simulation, draw two rival bids from the joint distribution of types:

$$(s, e, k, M) \sim F(N_s(\mu_s, \sigma_s), N_e(\mu_e, \sigma_e), N_k(\mu_k, \sigma_k), M(\cdot); \rho_{sM}, \rho_{kM}),$$

with the empirical distribution of M and the estimated parameters from the three regressions under item (1) above fed in.^f Solve the model numerically for the winner/loser (see LTW's online Internet Appendix A.3.1 for the relevant model equations).

(4) With $L = 20$ simulated samples, the SMM estimator searches for the parameter vector $\hat{\Theta}$ that minimizes the distance between the moments $\hat{m}$ estimated from the data and the average model-simulated moments:

$$\hat{\Theta} = \underset{\Theta}{\operatorname{argmin}} \left(\hat{m} - \frac{1}{L} \sum_{l=1}^L \hat{m}^l(\Theta) \right)' W \left(\hat{m} - \frac{1}{L} \sum_{l=1}^L \hat{m}^l(\Theta) \right).$$

W is the efficient weighting matrix, defined as the inverse of the estimated covariance of moments m . (We estimate this covariance using a Monte Carlo procedure with 1,000 samples of 500 deals each. For each sample, we compute the vector m , and then take the sample covariance across the 1,000 simulated values.)

^a The model-parameter notation in this table is close to that of Li, Taylor, and Wang (2018).

^b We measure the offer premium as in Table 2 (target's base-price one month prior to the offer announcement).

^c The abnormal bidder announcement return, $CAR(-1, 3)$ is estimated as in Table 11 in Section ?? below.

^d Michaelides and Ng (2000) find that using a simulated sample ten times as large as the empirical sample generates good small-sample performance.

^e The parameter vector Θ is held constant when generating the l 'th sample of simulations. Θ changes from l to $l + 1$ if the SMM optimizer proposes a new value for the next evaluation of the objective function (shown explicitly in the table). ^f In these simulations, the vector $Controls$ is set to zero because those features are outside the theoretical model.

Table 7
Observed data moments and fit of structural model

The table reports the eight observed data moments in our data used in our structural estimation and associated simulation of the model of Li, Taylor, and Wang (2018). Panel A shows the mean and conditional variance of the offer premium and its slope on relative acquirer size (log market value ratio, M). Panel B presents the mean fraction of cash and its slope on firm size. Panel C reports the mean bidder announcement return ($CAR(-1,3)$) and its slope on the cash share. Columns 1–5 show observed moments from 1,000 samples of 500 deals each; Columns 6–8 show corresponding moments from Li, Taylor, and Wang (2018), Table 3 Panel A. Columns 4 and 5 split the sample by bidder- and target-initiated deals, respectively. Standard errors are in parentheses. In the “Diff.”-columns (3) and (8), none of the entries are statistically significant on a 10% level. The sample comprises 1,845 completed takeovers of US public targets by US public bidders (2000–2020).

Parameter in Θ	Full sample			Bidder initiations	Target initiations
	Data (1)	Model (2)	Diff. (3)	Data (4)	Data (5)
Panel A: Offer premium (to estimate bidder synergies)					
Mean (μ_s)	0.463 (0.015)	0.499	-0.04	0.475 (0.012)	0.443 (0.011)
Conditional variance (σ_s)	0.102 (0.012)	0.089	0.01	0.100 (0.009)	0.106 (0.009)
Slope a_1 on $\log(M)$ (ρ_{sM}) ^a	0.033 (0.014)	0.023	0.01	0.035 (0.014)	0.030 (0.010)
Panel B: Fraction of bid in cash (to estimate bidder cash constraint)					
Mean (μ_k)	0.644 (0.019)	0.631	0.01	0.699 (0.015)	0.564 (0.013)
Conditional variance (σ_k)	0.139 (0.010)	0.132	0.01	0.135 (0.008)	0.141 (0.007)
Slope c_1 on $\log(M)$ (ρ_{kM}) ^b	0.121 (0.013)	0.043	0.08	0.110 (0.013)	0.127 (0.009)
Panel C: Acquirer announcement return (revelation effect of fraction cash)					
Mean (μ_ϵ)	-0.015 (0.005)	-0.011	0.00	-0.011 (0.003)	-0.021 (0.004)
Slope b_1 on Cash Frac. ($\rho_{\epsilon M}$) ^c	0.051 (0.017)	0.038	0.01	0.039 (0.013)	0.066 (0.014)

$$^a OP_i = a_0 + a_1 \log(M_i) + a_2 Controls_i + u_i.$$

$$^b Cash_i = c_0 + c_1 \log(M_i) + b_2 Controls_i + w_i.$$

$$^c CAR(-1, 3)_i = b_0 + b_1 \log(M_i) + b_2 Controls_i + b_3 FractionCash_i + \nu_i.$$

Table 8
Simulated efficiency loss: Total sample

Panel A shows the mean and median percent of the simulated deals that are inefficient, where the overvalued but lower-synergy bidder wins. Panel B shows the average synergy loss in inefficient deals only, either in percent of the pretakeover target market value or the highest synergy. Panel C repeats Panel B with the total number of deals as the basis for the computation. The total sample comprises 1,845 completed US public takeovers (2000–2020). The simulated losses are based on 1,000 samples of 500 observations using baseline parameter estimates from Table 8.

	Mean	Percentile				
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Percent of deals that are inefficient						
% inefficient deals	6.10%					
Panel B: Average synergy loss in inefficient deals						
% of target size	10.10	1.03	2.74	6.72	13.73	23.85
% of synergy	19.20	1.82	5.02	12.17	26.62	47.18
Panel C: Average synergy loss in all deals						
% of target size	0.62	0.06	0.17	0.41	0.84	1.45
% of synergy	1.17	0.11	0.31	0.74	1.62	2.88

Table 9
Simulated efficiency loss: Bidder- versus target-initiated transactions

Panel A shows the mean and median percent of the simulated deals that are inefficient, where the overvalued but lower-synergy bidder wins. Panel B shows the average synergy loss in inefficient deals only, either in percent of the pretakeover target market value or the highest synergy. Panel C repeats Panel B with the total number of deals as the basis for the computation. Results are shown for the full sample, bidder-initiated cases, and target-initiated contests. The total sample comprises 1,845 completed US public takeovers (2000–2020). The simulated losses are based on 1,000 samples of 500 observations using baseline parameter estimates from Table 8.

	Full sample		Bidder-initiated		Target-initiated	
	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Percent of deals that are inefficient						
% inefficient deals	6.10		6.27		7.37	
Panel B: Average synergy loss in inefficient deals						
% of target size	10.10	6.72	10.65	6.92	11.48	7.67
% of synergy	19.20	12.17	19.34	12.39	21.81	14.67
Panel C: Average synergy loss in all deals						
% of target size	0.62	0.41	0.67	0.43	0.85	0.56
% of synergy	1.17	0.74	1.21	0.78	1.61	1.08

Table 10

Determinants of stock consideration conditional on bidder firms' cash-targets, target firm information proxies, and bidder-initiation

The table reports the coefficient estimates from probit regressions for the likelihood of all-stock payment (columns 1-4) and Tobit regressions for the fraction of stock (columns 5-8). Columns 1 and 5 show the baseline regressions, columns 2 and 6 add information variables, and the remaining add bidder initiation. The cash-target is an estimate of the acquirer's target cash holding, obtained by regressing the ratio of cash to total assets on firm characteristics across all Compustat firms in a given year (see Eq. 10 in the text). Deviation from cash-target is the fitted residual for the estimated cash-target. The sample comprises completed takeovers of US public targets by US public bidders, 2000–2020. All variables are defined in Table 4. An intercept is included but not reported. t-values are in brackets. ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively.

Variable	Probit (y = all-stock)				Tobit (y = fraction of stock)			
	Baseline (1)	Information (2)	Initiation (3)	Interaction (4)	Baseline (5)	Information (6)	Initiation (7)	Interaction (8)
<u>Controls</u>								
Size	-0.224 (7.20)***	-0.236 (6.98)***	-0.228 (6.72)***	-0.226 (6.63)***	-0.243 (7.24)***	-0.257 (7.30)***	-0.254 (7.23)***	-0.257 (7.27)***
Large Deal	0.287 (3.01)***	0.248 (2.58)**	0.251 (2.59)***	0.253 (2.62)***	0.722 (7.61)***	0.662 (7.15)***	0.661 (7.16)***	0.659 (7.17)***
Leverage	-0.072 (0.46)	-0.111 (0.68)	-0.133 (0.82)	-0.142 (0.88)	0.076 (0.39)	0.015 (0.08)	0.012 (0.06)	0 0.00
Cash-target	-3.69 (3.32)***	-3.892 (3.43)***	-3.941 (3.47)***	-4.036 (3.32)***	-2.059 (1.74)*	-2.307 (1.97)**	-2.836 (2.27)**	-2.632 (2.10)**
Cash-target x Bidder Initiated				0.342 (0.34)	-0.864 (1.42)	-0.988 (1.65)*	0.034 (0.04)	-0.445 (0.45)
Deviation from Cash-target	-0.136 (0.31)	-0.245 (0.55)	-0.234 (0.52)	-0.285 (0.64)	-0.219 (0.47)	-0.372 (0.83)	-0.35 (0.77)	-0.423 (0.93)
M/B	0.014 (2.19)**	0.015 (2.37)**	0.016 (2.42)**	0.001 (0.06)	0.009 (1.24)	0.01 (1.44)	0.01 (1.39)	-0.009 (0.70)
M/B x Bidder Initiated				0.025 (1.92)*				0.029 (1.92)*
Dividend Dummy	-0.086 (0.87)	-0.049 (0.49)	-0.055 (0.55)	-0.055 (0.55)	-0.211 (2.10)**	-0.171 (1.73)*	-0.169 (1.71)*	-0.177 (1.80)*
R&D	2.33 (2.96)***	2.209 (2.87)***	2.132 (2.78)***	2.225 (2.93)***	1.975 (2.45)**	1.728 (2.23)**	1.831 (2.34)**	1.828 (2.34)**
Asset Tangibility	0.047 (0.36)	0.014 (0.10)	-0.003 (0.03)	0.008 (0.06)	0.479 (3.70)***	0.421 (3.28)***	0.419 (3.25)***	0.422 (3.30)***
Operating Efficiency	-0.001 (0.12)	-0.001 (0.09)	-0.001 (0.09)	0 0.00	0.001 (0.19)	0.002 (0.26)	0.002 (0.31)	0.003 (0.46)
High-Tech Dummy	0.005 (0.04)	0.041 (0.36)	0.046 (0.39)	0.019 (0.16)	-0.122 (1.11)	-0.069 (0.63)	-0.077 (0.70)	-0.088 (0.80)
Private Bidder Competition	-0.649 (2.24)**	-0.604 (2.08)**	-0.598 (2.05)**	-0.728 (1.60)	-0.675 (2.40)**	-0.609 (2.20)**	-0.606 (2.18)**	-0.497 (1.03)
Priv. Bid. Comp. x Bidder Ini.				0.214 (0.36)				-0.196 (0.33)
<u>Target information proxies</u>								
Bidder Initiated			-0.211 (2.43)**	-0.505 (2.44)**			-0.186 (1.31)	-0.299 (1.45)
Local Deal		0.308 (2.60)***	0.308 (2.59)***	0.212 (1.17)		0.352 (2.91)***	0.352 (2.91)***	0.13 (0.66)
Local Deal x Bidder Ini.				0.19 (0.79)				0.391 (1.59)
H-P Industry Relatedness		1.045 (2.46)**	1.076 (2.51)**	0.633 (1.04)		2.127 (4.90)***	2.118 (4.83)***	1.484 (2.24)**
H-P Industry Rel x Bidder Ini.				0.732 (0.87)				0.918 (1.06)
Recent SEO		0.186 (2.03)**	0.197 (2.14)**	0.12 (0.85)		0.273 (3.06)***	0.27 (3.03)***	0.301 (2.03)**
Recent SEO x Bidder Initiated				0.13 (0.73)				-0.048 (0.27)
Recent Acquirer		-0.095 (0.71)	-0.094 (0.70)	-0.094 (0.46)		-0.008 (0.07)	-0.012 (0.10)	-0.06 (0.30)
Recent Acquirer x Bidder Ini.				-0.015 (0.06)				0.088 (0.37)
Pseudo R-squared	0.1	0.12	0.12	0.13	0.11	0.12	0.12	0.13
N	1,272	1,264	1,264	1,264	1,211	1,203	1,203	1,203

Table 11
Average announcement returns to bidders, targets, and the bidder's close peers

The table reports the average three-day announcement-period stock return $CAR(-1,1)$, which is estimated as three times the second daily event parameter (γ_{2i}) in the conditional factor model, Eq. (11), in the text. The industry peers of an acquiring firm are the five firms with the highest Hoberg and Phillips (2016) industry-relatedness scores. For these peer firms, γ_{2i} is estimated after forming a portfolio of the five firms weighted by the industry-relatedness score. As explained on footnote 23 in the text, the table reports the t-statistic using the standard error of each γ_i^2 from the regression. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Sample of completed takeovers of US public targets by US public bidders, 2000-2020.

Sample		All deals (1)	Bidder-initiated (2)	Target-initiated (3)	Bidder-initiated –Target-initiated (4)
Panel A: Acquirer returns					
Full Sample	CAR(-1,1)	-0.014 (10.85)***	-0.01 (5.85)***	-0.02 (9.94)***	0.01 (2.24)**
	<i>N</i>	1,552	913	639	1,552
Fraction Stock > 0	CAR(-1,1)	-0.03 (19.6)***	-0.025 (13.01)***	-0.036 (14.79)***	0.012 (1.69)*
	<i>N</i>	865	471	394	865
Panel B: Target returns					
Full Sample	CAR(-1,1)	0.261 (178.86)***	0.284 (157.72)***	0.228 (89.88)***	0.055 (3.27)***
	<i>N</i>	1,431	848	583	1,431
Fraction Stock > 0	CAR(-1,1)	0.184 (99.18)***	0.216 (90.38)***	0.144 (47.87)***	0.072 (3.95)***
	<i>N</i>	765	421	344	765
Panel C: Combined (value-weighted) Acquirer and Target returns					
Full Sample	CAR(-1,1)	0.05 (53.61)***	0.059 (50.54)***	0.037 (23.14)***	0.022 (2.81)***
	<i>N</i>	1,767	1,039	728	1,767
Fraction Stock > 0	CAR(-1,1)	0.026 (23.54)***	0.039 (24.88)***	0.011 (7.65)***	0.029 (3.31)***
	<i>N</i>	964	523	441	964
Panel D: Acquirer peer-firm (relatedness-weighted) portfolio returns					
Full Sample	CAR(-1,1)	0.007 (11.75)***	0.007 (9.42)***	0.007 (7.11)***	0 (0.10)
	<i>N</i>	1,577	868	709	1,577
Fraction Stock > 0	CAR(-1,1)	0.006 (8.32)***	0.008 (8.37)***	0.003 (3.43)***	0.005 (1.56)
	<i>N</i>	917	447	470	917

Table 12
Bidder initiation and determinants of acquirer announcement returns

The table reports OLS coefficients estimates of bidder CAR(-1,3). CAR is computed as $R_{it} - \hat{R}_{it}$, where $\hat{R}_{it}$ is the expected return estimated from the Market Model, $R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$, estimated over the window (-297, -43). R_{mt} is the CRSP value-weighted market return. Columns 1-4 restrict the analysis to completed takeovers of US public targets by US public bidders, 2000-2020. Columns 5-8 implement a Heckman (1979) two-step procedure, with the first-stage selection probit estimated on the full Compustat universe and controlling for firm Size, Leverage, Cash Holding, M/B, Dividend Dummy, R&D, Asset Tangibility, and Operation Efficiency. Columns 1 and 5 present baseline regressions; columns 2 and 6 add information variables; the remaining columns include a bidder initiation indicator and its interactions. All variables are defined in Table 4. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	OLS				Heckman regression (2nd stage)			
	Baseline (1)	Information (2)	Initiation (3)	Interaction (4)	Baseline (5)	Information (6)	Initiation (7)	Interaction (8)
<u>Controls</u>								
Size	0.003 (1.62)	0.001 (0.39)	0.001 (0.28)	0.001 (0.36)	-0.103 (0.64)	-0.047 (0.58)	-0.044 (0.54)	-0.048 (0.58)
Large Deal		-0.041 (5.04)***	-0.041 (5.01)***	-0.04 (4.98)***		-0.041 (6.08)***	-0.041 (6.05)***	-0.04 (6.03)***
Leverage	0.016 (0.81)	0.022 (1.16)	0.023 (1.17)	0.022 (1.20)	0.153 (0.73)	0.085 (0.78)	0.082 (0.75)	0.087 (0.79)
Cash Holding	-0.008 (0.20)	0.021 (0.51)	0.021 (0.50)	0.021 (0.50)	0.139 (0.58)	0.089 (0.73)	0.084 (0.70)	0.09 (0.73)
M/B	-0.001 (2.23)**	-0.001 (1.06)	-0.001 (1.05)	-0.001 (0.56)	-0.007 (0.81)	-0.003 (0.71)	-0.003 (0.68)	-0.003 (0.71)
M/B x Bidder Initiated				0.000 (0.04)				0.000 (0.04)
Dividend Dummy	0.000 (0.01)	-0.001 (0.10)	0.000 (0.08)	-0.001 (0.14)	0.067 (0.65)	0.029 (0.57)	0.027 (0.53)	0.03 (0.57)
R&D	-0.056 (0.80)	-0.005 (0.07)	-0.004 (0.05)	-0.004 (0.06)	-0.479 (0.74)	-0.197 (0.59)	-0.184 (0.56)	-0.201 (0.60)
Asset Tangibility	-0.008 (0.98)	-0.01 (1.26)	-0.01 (1.23)	-0.01 (1.20)	0.139 (0.62)	0.055 (0.49)	0.051 (0.46)	0.057 (0.50)
Operating Efficiency	-0.001 (0.68)	-0.001 (0.80)	-0.001 (0.80)	-0.001 (0.84)	-0.001 (0.55)	-0.001 (1.13)	-0.001 (1.15)	-0.001 (1.19)
High-Tech Dummy		-0.018 (2.52)**	-0.018 (2.51)**	-0.019 (2.62)***		-0.018 (2.55)**	-0.018 (2.55)**	-0.018 (2.64)***
All-Stock		-0.032 (3.64)***	-0.032 (3.62)***	-0.029 (2.04)**		-0.032 (4.63)***	-0.032 (4.55)***	-0.029 (3.05)***
All-Stock x Bidder Ini.				-0.005 (0.30)				-0.005 (0.39)
<u>Target information proxies</u>								
Bidder Initiated			0.005 (0.85)	-0.005 (0.48)			0.005 (0.83)	-0.005 (0.53)
Local Deal		0.004 (0.46)	0.004 (0.45)	0.004 (0.21)		0.005 (0.54)	0.005 (0.54)	0.004 (0.29)
Local Deal x Bidder Ini.				0.001 (0.05)				0.001 (0.07)
H-P Industry Relatedness		-0.017 (0.44)	-0.017 (0.45)	-0.04 (0.54)		-0.016 (0.53)	-0.017 (0.54)	-0.037 (0.85)
H-P Ind. Rel. x Bidder Ini.				0.042 (0.50)				0.037 (0.61)
Recent SEO		-0.014 (2.19)**	-0.014 (2.21)**	-0.026 (2.31)**		-0.014 (2.38)**	-0.014 (2.40)**	-0.027 (2.96)***
Recent SEO x Bidder Ini.				0.02 (1.64)				0.021 (1.81)*
Recent Acquirer		-0.011 (1.64)	-0.011 (1.64)	-0.011 (1.58)		-0.01 (1.24)	-0.01 (1.26)	-0.01 (1.21)
Inverse Mill's Ratio					-0.572 (0.66)	-0.258 (0.59)	-0.241 (0.55)	-0.264 (0.59)
R-squared/Chi-squared	0.02	0.08	0.08	0.08	3.82	96.95	97.95	102.04
N	1,233	1,228	1,228	1,228	119,632	119,627	119,627	119,627

Table 13
Acquirer long-run (36-month) abnormal stock return (α) by deal-initiation.

The table reports the coefficient estimates from calendar-time portfolio regressions, using monthly returns and the four-factor return-generating process shown in Table 11 (Eq. 11 in the text). The dependent variable is the monthly return on acquirer portfolios sorted by deal initiation. The explanatory variables are the Fama and French (1993) three factors (*Market*, *SMB*, and *HML*) and the Carhart (1997) momentum (*UMD*). *Market* is the excess return on the value-weighted CRSP market index. The constant term α measures the abnormal stock return. Columns 3 and 6 are long bidder-initiated deals and short target-initiated deals. An acquirer enters the portfolio in the month following a bid announcement and is held for 36 months or until delisting, whichever comes first. The sample is limited to bids containing stock in columns 1-3 and all-cash bids in columns 4-6. The bidder-portfolio monthly returns are equal-weighted in Panel A and value-weighted in Panel B. The sample comprises 1,845 completed takeovers of US public targets by US public bidders, 2000-2020 (287 months in the regression). t-statistics (with robust standard errors) are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Fraction Stock > 0			Fraction Stock = 0		
	Bidder Initiated (1)	Target Initiated (2)	Bidder Ini. – Target Ini. (3)	Bidder Initiated (4)	Target Initiated (5)	Bidder Ini. – Target Ini. (6)
Panel A: Equal-weighted portfolios						
α	0 (0.08)	-0.003 (1.04)	0.003 (1.61)	0.004 (2.87)***	0.004 (2.27)**	0.001 (0.35)
Market	1.187 (25.08)***	1.25 (20.55)***	-0.038 (0.75)	0.978 (26.17)***	1.031 (26.28)***	-0.053 (1.31)
SMB	0.664 (10.38)***	0.897 (10.94)***	-0.216 (3.15)***	0.135 (2.46)**	0.395 (7.46)***	-0.303 (5.14)***
HML	-0.05 (0.87)	0.164 (2.25)**	-0.188 (3.10)***	0.215 (4.76)***	0.154 (3.26)***	0.067 (1.37)
UMD	-0.25 (6.09)***	-0.183 (3.49)***	-0.06 (1.37)	-0.151 (4.58)***	-0.172 (5.05)***	0.01 (0.27)
R ²	0.82	0.77	0.07	0.8	0.82	0.13
Panel B: Value-weighted portfolios						
α	0 (0.08)	-0.001 (0.57)	0.002 (0.65)	0.001 (0.66)	0 (0.16)	0.001 (0.51)
Market	1.032 (18.32)***	1.01 (18.59)***	0.044 (0.64)	0.892 (25.25)***	0.903 (16.40)***	-0.014 (0.25)
HML	0.337 (4.43)***	-0.004 (0.05)	0.344 (3.70)***	-0.252 (4.86)***	-0.024 (0.32)	-0.097 (1.20)
SMB	-0.284 (4.19)***	0.048 (0.74)	-0.316 (3.84)***	-0.047 (1.09)	0.147 (2.22)**	-0.207 (3.11)***
UMD	0.13 (2.65)***	-0.061 (1.29)	0.2 (3.35)***	-0.055 (1.75)*	0.05 (1.04)	-0.072 (1.48)
R ²	0.64	0.63	0.17	0.74	0.54	0.04

Table 14

Average announcement returns to five-firm portfolios of acquiring firms' industry peers

The table reports average cumulative abnormal returns (CAR) for the acquirer's industry peers over two event windows relative to the M&A announcement date (day 0): (-1, 3) and (-1, 6). CAR is computed as $R_{it} - \hat{R}_{it}$, where $\hat{R}_{it}$ is the expected return estimated from the Market Model, $R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$, estimated over the window (-297, -43). R_{mt} is the CRSP value-weighted market return. Columns 1-2 identify peers using the five closest firms based on Hoberg and Phillips (2016) industry-relatedness scores. Columns 3-4 and 5-6 further restrict peers to those within the same 3-digit and 4-digit SIC codes, respectively. CARs are equally weighted (Equal Weighted) or weighted by the relative H-P relatedness score (Relatedness Weighted) for each acquirer. The sample comprises completed takeovers of US public targets by US public bidders, 2000-2020. t-values are in parentheses. ***, **, and * denotes significance at the 1%, 5%, and 10% levels, respectively.

Rival weighting	All rivals		Same 3-Digit SIC		Same 4-Digit SIC	
	CAR(-1,3) (1)	CAR(-1,6) (2)	CAR(-1,3) (3)	CAR(-1,6) (4)	CAR(-1,3) (5)	CAR(-1,6) (6)
Panel A: Full sample of public-to-public takeovers						
Equal Weighted	0.006 (3.86)***	0.006 (3.26)***	0.006 (3.45)***	0.005 (2.41)**	0.006 (3.07)***	0.004 (1.63)
Relatedness Weighted	0.008 (4.62)***	0.008 (3.92)***	0.007 (3.68)***	0.006 (2.70)***	0.007 (3.35)***	0.005 (1.94)*
<i>N</i>	1,387	1,387	1,207	1,207	1,024	1,024
Panel B: Takeovers with shares as part or all of the payment						
Equal Weighted	0.004 (1.71)*	0.002 (0.83)	0.005 (1.75)*	0.002 (0.73)	0.004 (1.48)	0.00 (0.41)
Relatedness Weighted	0.005 (2.07)**	0.003 (1.07)	0.006 (2.05)**	0.004 (1.00)	0.005 (1.79)*	0.002 (0.59)
<i>N</i>	755	755	662	662	565	565
Panel C: Bidder-initiated takeovers with shares as part or all of the payment						
Equal Weighted	0.002 (0.77)	0.001 (0.31)	0.007 (1.66)*	0.005 (1.01)	0.003 (0.71)	0.001 (0.18)
Relatedness Weighted	0.005 (1.36)	0.003 (0.85)	0.008 (1.91)*	0.006 (1.23)	0.004 (0.99)	0.002 (0.34)
<i>N</i>	410	410	353	353	302	302

Table 15
Auction characteristics: Financial v. non-financial bidders

The table reports mean and median characteristics of the auction process, split by financial and non-financial bidders. Sample of 1,845 successful acquisitions by US-domiciled public bidders of public targets in manufacturing industries from 2000 through 2020. ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively.

Variable	Full Sample			Financial Bidder			Non-Financial Bidder			Financial-Non Financial	
	N (1)	Mean (2)	Median (3)	N (4)	Mean (5)	Median (6)	N (7)	Mean (8)	Median (9)	Δ Mean (10)	t-stat. (11)
Percentage of Stock Payment	1,753	0.41	0.26	66	0.24	0	1,687	0.42	0.29	-0.18	(3.21)***
Stock Payment Indicator	1,845	0.24	0	69	0.12	0	1,776	0.24	0	-0.12	(2.38)**
Premium (Month)	1,737	50.52	34.22	61	35.00	27.27	1,676	51.09	34.39	-16.09	(0.72)