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CASH IS KING - REVALUATION OF TARGETS AFTER MERGER BIDS

Ulrike Malmendier
Marcus Matthias Opp
Farzad Saidi

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ABSTRACT

We provide evidence that a significant fraction of the returns to merger announcements reflects target revaluation rather than the causal effect of the merger. In a sample of unsuccessful merger bids from 1980 to 2008, targets of cash offers are revalued by +15% after deal failure, whereas stock targets revert to their pre-announcement levels. This result holds for the subsample where deal failure is exogenous to the target's stand-alone value. We also show that cash bidders revert to their pre-announcement levels, while stock bidders fall below. The results suggest that cash bids signal target undervaluation and stock bids indicate acquirer overvaluation.

Ulrike Malmendier
Department of Economics
549 Evans Hall # 3880
University of California, Berkeley
Berkeley, CA 94720-3880
and NBER
ulrike@econ.berkeley.edu

Farzad Saidi
New York University
19 W. 4th Street (6th Floor)
New York, NY 10012
saidi@nyu.edu

Marcus Matthias Opp
University of California, Berkeley
Haas School of Business
Student Services Bldg. #1900
Berkeley, CA 94720-1900
mopp@haas.berkeley.edu

Mergers are among the largest and most disruptive events in a corporation’s lifetime. The proper assessment of their value implications has been of foremost interest to policymakers and academic researchers alike. Much of the research on mergers and acquisitions aims to assess which transactions create, or destroy, how much shareholder value, including a recent debate about “massive wealth destruction” through mergers (Moeller et al. (2005)).

Empirically, the measurement of the causal effect of mergers is challenging. The standard approach in the literature is to use stock-market reactions to merger announcements and to interpret the combined change in target and acquirer values as the expected total value created. This approach builds on a number of assumptions, including the assumptions that markets are efficient, that mergers are unanticipated and unlikely to fail, and that merger bids reveal little about the stand-alone values of the merging entities. Various studies document a small positive combined announcement return of targets and bidders, and interpret this finding as evidence in favor of value creation.¹

In this paper, we argue that a large portion of the announcement effect reflects target revaluation rather than value created through mergers, and that this portion varies with the type of payment: Targets of cash offers are revalued by +15%, but there is no revaluation of stock targets. We also find significant negative revaluation effects for stock bidders, but no effect for cash bidders. Our results imply that the widespread use of announcement effects significantly distorts the assessment of mergers.

Our empirical analysis is motivated by the existing body of theories that predict that acquirers’ private information is reflected in their bids and their choice of payment.² While the negative information effect of stock bids on the *acquirer*’s stand-alone value is well understood at least since Myers and Majluf (1984), we focus on information revelation about the target. Our identification strategy exploits deal failures to measure

¹ Jensen and Ruback (1983); Jarrell et al. (1988); Andrade et al. (2001).

² Examples include Fishman (1989), where bidders use cash to preempt competing offers, and Hansen (1987) and Eckbo et al. (1990), where the choice of payment reflects private information about the bidder’s own value.

information revelation: we compare target values prior to the announcement and after failure of a bid. To see the intuition for our approach consider the following stylized example: A target currently trades at \$100 and receives a cash offer of \$125, increasing its price to \$125 per share. Shortly afterwards, the deal fails for exogenous reasons, and the target then trades at \$115. After deal failure, the information the bid revealed about the target's stand-alone value is no longer confounded with the merger effect. Hence, we can attribute \$15 of the original \$25 announcement effect to the revision of beliefs about the stand-alone value of the target.

We collect a new data set of all unsuccessful merger bids in the US between 1980 and 2008. We document initial announcement effects of 15% for stock deals and 25% for cash deals (including the 25-trading days run-up). We then show that, by the time of deal failure, the value of stock targets falls below the pre-announcement level while the value of cash targets remain at 15% cumulative abnormal returns, relative to the pre-announcement level. All results hold controlling for a host of deal- and firm-level characteristics, including the target size, relative deal size, offer premium, and hostility of the bid. The magnitude of our estimates implies that, for the average cash deal completed during our sample period, approximately \$78m (in 2010 dollars) should be attributed to target revaluation rather than the merger.³

We also show that, consistent with previous studies, stock *acquirers* trade at significantly lower prices post-failure (-17%) while cash acquirers return to their pre-announcement level.⁴ Taken together, our findings suggest that cash bids are “all about the target,” and indicative of prior target undervaluation, while stock bids are “all about the acquirer,” and indicate prior acquirer overvaluation.

An important issue for the interpretation of our results is sample selection: deal failure

³ The average market capitalization of targets in all successful deals was \$0.91bn, and in all successful cash deals \$0.52bn, both in 2001 dollars; see Tables Ia and A.I, leftmost columns. We apply the 15% revaluation effect to the latter (smaller) number.

⁴ For similar findings, see Rhodes-Kropf et al. (2005) and Dong et al. (2006). Further evidence on stock-market driven acquisitions is provided in Friedman (2006). Savor and Lu (2009) compare unsuccessful bids with *completed* deals and find that unsuccessful bidders perform worse.

is generally not exogenous to target and bidder valuations. To address this endogeneity concern we seek to identify the subsample of deals where failure was exogenous to the stand-alone value of the target (for the analysis of target revaluation), and the subsample where failure was exogenous to the stand-alone value of the acquirer (for the analysis of acquirer revaluation). We perform an extensive news search for the failure reasons for all observations in our sample. For the target analysis, we isolate all regulatory interventions and negative shocks to the bidder that can be reasonably interpreted as exogenous to the target's stand-alone value. For the bidder analysis, we isolate negative shocks to the target, such as the uncovering of negative information in the due-diligence process, that are exogenous to the bidder's value. We then replicate and confirm our results on the respective subsamples. In addition, we find that, for every failure category other than market-wide shocks ("September 11," "October 87," etc.), we obtain very similar estimates (though statistically weaker, given the small subsamples). This indicates that our result is robust to alternative classifications of exogenous failure reasons.

The robustness of the revaluation effect across categories is also consistent with an auxiliary analysis on the determinants of failure: We show that the choice of cash versus stock payment does not predict failure, whereas other bid and firm characteristics, such as hostility of the bid or relative deal size, do predict deal failure. In other words, within the (partly self-selected) sample of failed bids, there is no additional sorting by means of payment. Taken together, the robustness of our results in the exogenous- and the endogenous-failure samples as well as the finding that cash payment does not predict failure are most easily explained if there is no differential bias in the cash-stock difference in revaluation between successful and unsuccessful bids.

We also show that the revaluation effect is not explained by more lucrative future takeover offers: Failed cash deals are no more likely than failed stock deals to be followed by another takeover attempt in subsequent years, nor are future offer premia higher.

Why, then, do cash bids induce the market to positively revalue the target? One

explanation is that the acquirer’s cash bid reveals positive private information about the target. A related explanation is limited attention: a cash bid draws investors’ attention to the target and induces them to process information that was already available. In both cases, the market learns about the target’s value from the bidder’s action, and we will dub both interpretations *information revelation* in a broad sense.

To ease the interpretation of our empirical results, we develop a theoretical framework, to show that the data can be understood through one simple learning channel.⁵ Our model incorporates rational market updating into the mispricing framework of Shleifer and Vishny (2003). The market updates its beliefs about the stand-alone values of the bidder and target upon observing an offer. Due to the presence of uninformed bidders, the updating is imperfect, and informed bidders can benefit from their information. Informed bidders make cash offers when the combined entity is undervalued as to prevent target shareholders from participating in the long-run price appreciation. They make stock offers when the combined entity is overvalued as to share the long-run price decline with target shareholders.

In this framework, rational market updating predicts that firms involved in cash deals are revalued upwards relative to firms engaging in stock deals, for both the target and the bidder. On an absolute scale, a cash offer is always positive news about the stand-alone value of the target, and a stock offer is always negative news about the bidder. Interestingly, and consistent with our empirical findings, a stock offer does not necessarily reveal positive information about the target — an informed bidder would have chosen cash if his information about the target had been sufficiently positive.

Our findings have significant implications for the welfare assessment of mergers, i.e., for the question whether mergers create surplus, as in the Q -theory model of Jovanovic and Rousseau (2002), or whether they merely have distributional consequences, as in the misvaluation-driven model of Shleifer and Vishny (2003). Our findings imply that,

⁵ Our findings are also consistent with the more advanced model by Rhodes-Kropf and Viswanathan (2004) who derive a rational explanation for misvaluation-induced merger waves.

while stock deals may be associated with declines in stock-market capitalization, a large fraction is due to revaluation rather than the merger. Hence, naive announcement-effect based estimates of the causal effect of stock-financed mergers are downward biased. In contrast, stock-price increases at the announcement of cash deals reflect, to a large extent, target revaluation rather than surplus creation.

Our findings relate to a large literature on the returns to mergers. Most studies using announcement returns find that tender offers generate small overall value with virtually all the gains accruing to the target; see, for example, the overview papers by Jensen and Ruback (1983), Andrade et al. (2001), and Betton et al. (2008). Using probability scaling methods, Bhagat et al. (2005) find larger estimates of combined value creation (7.3%) than the conventional CAR estimate (5.3%) by Bradley et al. (1988) in an earlier sample.

Following Travlos (1987), studies of announcement returns distinguish between cash and stock transactions and typically attribute the negative announcement returns for stock bidders to the bid revealing negative information about themselves, consistent with the pecking order model of Myers and Majluf (1984).⁶ Huang and Walkling (1987) document higher announcement returns for cash targets than for stock targets, including the initial run-up. Their point estimates, 14.4% for stock and 29.3% for cash, are remarkably close to the (initial) announcement effects in our sample, despite the different sample composition (all announced deals versus failed deals) and the different sample period (1977-1982 versus 1980-2008). While our paper does not focus on announcement returns to the initial bid, the similar magnitudes are suggestive of targets in failed and in successful deals not being too dissimilar.

Most closely related to our analysis are earlier papers by Dodd (1980), Bradley et al. (1983), Davidson et al. (1989), and Sullivan et al. (1994), who examine failed acquisitions to study information revelation about the target. For example, Davidson et al. (1989) find that targets of unsuccessful bids trade higher than before the announcement because

⁶ Alternatively, Jovanovic and Braguinsky (2004) generate bidder discounts in a Q -theory framework.

they are more likely to become future targets, while targets that do not obtain a future offer revert to pre-announcement levels. In contrast to our analysis, their study does not distinguish between cash and stock transactions. The conditioning on payment allows us to separate targets for which (almost) no information is revealed (stock targets) and targets that are revalued (cash targets). Our theoretical framework and empirical findings are, instead, consistent with the (small-sample and univariate) evidence on differences in stock and cash targets in Sullivan et al. (1994). Our analysis is also closely related to Savor and Lu (2009), who analyze the performance of bidders by comparing successful and failed transactions, and to Malmendier et al. (2010), who compare the returns of competing bidders (winners and losers) in contested mergers and show that winner underperform in the long-run.

The remainder of the paper is organized as follows: Section I provides a simple theoretical framework that motivates our analysis and spells out the identifying assumptions. In Section II, we describe our data. Section III contains the main results of our empirical analysis and a broad range of robustness checks. Section IV discusses the economic magnitude of our effects as well as possible channels. Section V concludes.

I. Theoretical Motivation

We motivate our empirical approach in a simple model, in which firms may (or may not) be mispriced and the market rationally updates upon observing mergers bids. To highlight the effectiveness of this learning channel in explaining all of our empirical results, we deliberately shut off other channels of potential theoretical interest, following the framework (and notation) of Shleifer and Vishny (2003). (As we note below the results are also consistent with a richer theoretical framework such as Rhodes-Kropf and Viswanathan (2004).) We generate the following testable predictions:

1. Target revaluation is positive in cash deals and indeterminate for stock deals.

2. Bidder revaluation is negative in stock deals and positive for cash deals.
3. The difference between cash and stock revaluations is positive, both for the target and the bidder.

All proofs are delegated to Appendix A.

Consider a bidder B who has private information about its own long-run value and that of a (potential) target T . As in Shleifer and Vishny (2003), B aims to maximize its long-run value, while T only cares about the current stock price which reflects all publicly available information.⁷ In addition, there are noise bidders, \tilde{B} , who make random cash and stock acquisitions, unrelated to valuations. The presence of noise bidders captures all other (unobservable) rationales for the choice of the medium of exchange, separate from private information about valuation. Since these noise bidders affect the behavior of informed bidders solely through their effect on market learning, we first solve for the optimal decisions of informed bidders given an exogenous market updating function. In a second step, we solve for the equilibrium market updating function.

We express market valuations of B , T , and the merged firm M in terms of valuation multiples \hat{q}_i and capital stock in place K_i , with $\hat{V}_i = \hat{q}_i K_i$ for $i \in \{B, T, M\}$, and $K_M = K_B + K_T$. We can decompose the market valuation of the merged firm M into capital-stock weighted valuation multiples of bidder and target, $\hat{q}_{wa} = \hat{q}_B \frac{K_B}{K_B + K_T} + \hat{q}_T \frac{K_T}{K_B + K_T}$, plus synergies s per unit of joint capital stock:

$$\hat{V}_M = \hat{q}_M K_M = (\hat{q}_{wa} + s) K_M = \hat{q}_B K_B + \hat{q}_T K_T + s K_M. \quad (1)$$

For ease of exposition, we assume that the bidder has no private information about the synergies s and that the capital stock is observable to the market. Hence, potential misvaluations must be caused by misperceived valuation multiples. We denote the initial market valuations as $\hat{q}_i(0)$ and the updated (intermediate) market valuations after

⁷ Since targets only care about the short run, it is irrelevant whether targets have access to the same information as the bidder.

observing the bidding behavior of B as $\hat{q}_i(a)$, where $a = C$ in case of an all-Cash bid, $a = S$ in case of an all-Stock bid, and $a = N$ in case of No acquisition at takeover premium P . Finally, we denote the long-run valuations of the bidder and the target as q_B and q_T , respectively. The long-run values are drawn from two independent continuous distributions, with means equal to the current market valuations, $\hat{q}_i(0)$. Thus, on average bidders and targets are fairly valued initially.

The timing is as follows:

At $\mathbf{t=0}$, market valuations are $\hat{q}_i(0)$ and, conditional on becoming informed, bidder B learns the long-run multiples q_i .⁸

At $\mathbf{t=1}$, the bidder chooses one of three possible actions a : an all-Cash bid, $a = C$; an all-Stock bid, $a = S$; and No acquisition, $a = N$ at takeover premium P . After observing a , the market updates the estimated valuation multiples to $\hat{q}_i(a) = \mathbb{E}(q_i|a)$.

At $\mathbf{t=2}$, the merger bid succeeds with exogenous probability p .⁹

At $\mathbf{t=3}$, market prices adjust to their long-run values $V_i = q_i K_i$.

Since target management is only concerned about short-run valuations, it will accept any offer price PK_T as long as $P \geq \hat{q}_T(a)$. We follow Shleifer and Vishny (2003) in assuming that the premia for cash and stock bids are identical.¹⁰ Hence, the target share of the merged company, x , in stock bids is set such that:

$$x \cdot \hat{q}_M(S) \cdot K_M = PK_T. \quad (2)$$

⁸ The probability of becoming informed matters only for the market updating function and, hence, does not need to be specified here.

⁹ This simplifying assumption is motivated by our empirical evidence: Our empirical result holds in the sample of exogenously failed deals, and deal failure is not related to the medium of exchange.

¹⁰ This simplifying assumption is consistent with our empirical evidence: Premia do not vary significantly between cash and stock bids in our data. If P were chosen endogenously, for example such that the target's participation constraint is met with equality, $P(C) = \hat{q}_T(C)$ and $P(S) = \hat{q}_T(S)$, then premia would be higher for cash deals since $\hat{q}_T(C) > \hat{q}_T(S)$ (see Proposition 2). Even with this endogenous adjustment of premia, the qualitative predictions of our model with regards to the medium of exchange would be unaffected.

Proposition 1 *Given the market updating function $\hat{q}_{wa}(S)$ an informed bidder submits a merger bid if and only if*

$$q_T K_T + s K_M \geq P K_T \min\left(\frac{q_M}{\hat{q}_M(S)}, 1\right). \quad (3)$$

Conditional on submitting a bid, the bidder chooses stock over cash if and only if:

$$q_{wa} \leq \hat{q}_{wa}(S). \quad (4)$$

The intuition is simple: It is optimal to submit a bid if the long-run value of the target plus the synergies, $q_T K_T + s K_M$, is higher than the long-run cost of acquiring the target, i.e., $P K_T$ for cash bids and $P K_T \cdot \frac{q_M}{\hat{q}_M(S)}$ for stock bids. Note that the cost of acquiring the target varies by medium of exchange even though the market value of the offer at the time of the announcement is P per capital unit in both cases. The reason is that the effective long-run cost of a stock acquisition to the *informed* bidder is shaded by the devaluation ratio $\frac{q_M}{\hat{q}_M(S)} < 1$. If the information about q_B is sufficiently low, some transactions that would be unattractive as a cash deal might still create value for the bidder if structured as a stock deal, namely if $P K_T > s K_M + q_T K_T \geq P K_T \frac{q_M}{\hat{q}_M(S)}$.

More generally, the decision to choose cash versus stock depends on whether the informed bidder expects a long-run price decline or appreciation of the *combined* firm upon making a stock offer. Whenever the private information suggests that the combined entity is undervalued relative to the market assessment, i.e., when $q_{wa} > \hat{q}_{wa}(S)$, the informed bidder chooses cash to prevent the target shareholders from participating in the expected long-run price appreciation. In contrast, when the private information suggests negative information about the merged company's future performance ($q_{wa} < \hat{q}_{wa}(S)$), the informed bidder chooses stock to share the losses with target shareholders. Figure 1 illustrates this intuition. The figure plots the optimal bidding behavior of the informed bidder as a function of his information q_B and q_T , holding constant market updating at

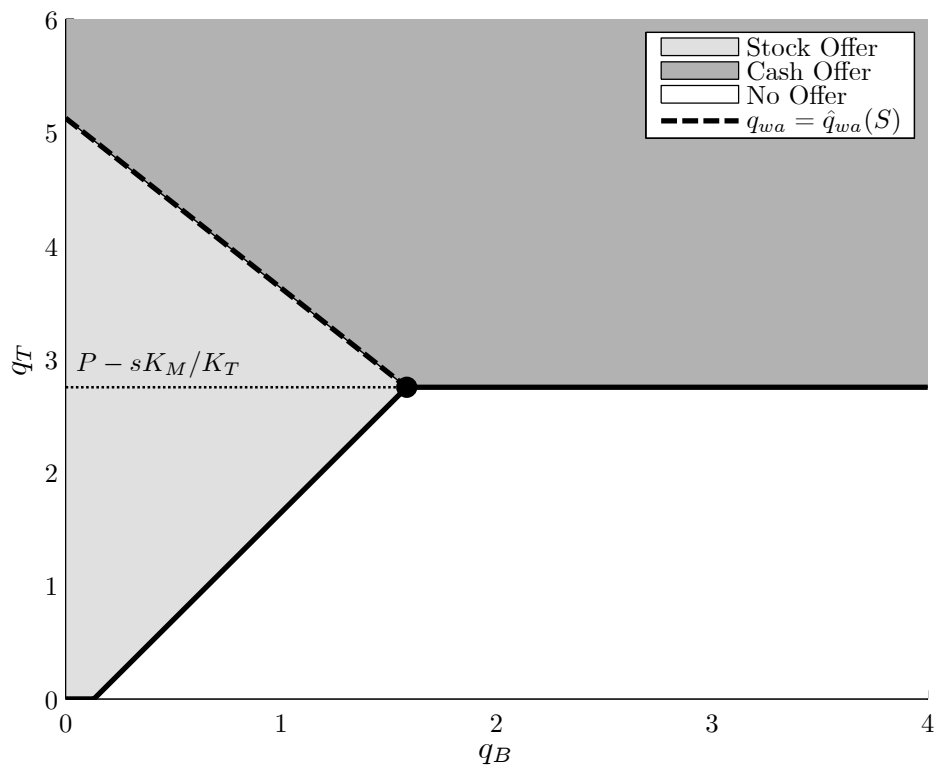


Figure 1. Optimal Bidding Decision. The figure plots the optimal bidding decision of an informed bidder as a function of the pair (q_B, q_T) , given the updating function of the market, for the parameter values $\hat{q}_{wa}(S) = 2.05$, $K_B/K_M = 0.6$, $P = 3$, $s = 0.1$.

$\hat{q}_{wa}(S) = 2.05$. Price and synergies are fixed at $P = 3$ and $s = 0.1$. The relative size of bidder and target is chosen so that it roughly corresponds to the respective empirical moment in our sample, with $K_B/K_M = 0.6$, so that bidders are on average 50% larger than targets. The graph illustrates the relevant offer regions: An offer is made for all pairs (q_B, q_T) above the (kinked) solid line, i.e., if the information about the target is sufficiently good. No offer is made for all pairs below the solid line, i.e., if the information about the target is sufficiently low. The decision to choose cash versus stock depends on the target's value, both in absolute and relative to the bidder's value. If the target's value per unit of capital, q_T , is high enough (above the horizontal line $P - s\frac{K_M}{K_T}$), the potential acquirer is willing to make a cash offer, regardless of its own value q_B . And whenever q_T is high relative to q_B , the bidder is willing to make a stock offer, regardless of the target's and his own absolute values q_T and q_B . Where these two areas overlap, the choice of

stock versus cash depends on whether the combined entity will (still) be overvalued after a stock bid, i.e., whether $\hat{q}_{wa}(S) \geq q_{wa}$. Whenever the private information suggests that the combined entity will be undervalued relative to the market assessment, the informed bidder chooses cash (dark grey region). And, whenever the private information suggests overvaluation, the informed bidder chooses stock (light grey region).

In order to retrieve the rational updating function of the market, we need to specify the propensity of uninformed bidders, \tilde{B} , to engage in mergers. We consider the case that the probability of an informed bid, ρ , is identical for both cash and stock bids, i.e., the relative frequency of cash and stock bids by uninformed bidders matches the choice of informed bidders. In that case, the updating function for stock bids becomes:

$$\hat{q}_i(S) = \rho \mathbb{E}(q_i | S, B) + (1 - \rho) \mathbb{E}(q_i | S, \tilde{B}) \quad (5)$$

$$= \rho \mathbb{E}(q_i | S, B) + (1 - \rho) \hat{q}_i(0) \quad (6)$$

That is, the conditional expectation of the valuation multiples after observing a stock offer is equal to the weighted average of the conditional expectation assuming the bidder is informed and of the unconditional expectation. Since the choice of cash versus stock by an informed bidder depends itself on $\hat{q}_T(S)$ and $\hat{q}_B(S)$, summarized by $\hat{q}_{wa}(S)$, we are looking for a fixed point in which the market updating function is given by equation (6) and the decision of the bidder is optimal given the market updating function (see Proposition 1). Once we have determined $\hat{q}_{wa}(S)$, the updating function for cash offers is simply:

$$\hat{q}_i(C) = \rho \mathbb{E}(q_i | C, B) + (1 - \rho) \hat{q}_i(0). \quad (7)$$

In the example shown in Figure 1, the updating functions can be obtained by integrating over the respective regions using the postulated joint probability density functions. While we cannot obtain closed-form expressions for most distributions, we can determine the

direction of updating:¹¹

Proposition 2 *Bidders of stock transactions are revalued downwards and targets of cash transactions are revalued upwards at announcement of the bid:*

$$\hat{q}_B(S) < \hat{q}_B(0), \quad (8)$$

$$\hat{q}_T(C) > \hat{q}_T(0). \quad (9)$$

Cash offers signal better information about all entities $i \in \{B, T, M\}$ than stock offers:

$$\hat{q}_i(C) > \hat{q}_i(S). \quad (10)$$

Consider again the example plotted in Figure 1 and further assume that bidder valuations are drawn from an exponential distribution with mean $\hat{q}_B(0) = 2.5$ and targets from an independent exponential distribution with mean $\hat{q}_T(0) = 2$, both in line with our empirical moments. Then, the equilibrium valuation multiples are given by:

$$(\hat{q}_B(S), \hat{q}_B(C)) = (2.09, 2.62) \quad (11)$$

$$(\hat{q}_T(S), \hat{q}_T(C)) = (1.98, 2.61) \quad (12)$$

In other words, stock bidders are revalued downwards by 16.4%, from 2.5 to 2.09, whereas cash bidders are revalued upwards by 4.8%, from 2.5 to 2.62. Targets of stock offers suffer slight downwards revaluation (−1%), while targets of cash offers are revalued upwards by 30.5%. The example reveals that, surprisingly, obtaining a stock offer might convey negative news about the target. While any offer conveys positive news about the target in that it provides a lower bound on its value (see solid line in the graph), a stock offer also puts an upper bound on the valuation of the target since a better target would

¹¹ The market also updates in response to observing “no offer.” Since our empirical analysis conditions on the existence of a bid, the characterization of $\hat{q}_i(N)$ is not of interest here.

have obtained a cash offer. Rational market updating takes both bounds into account.

Empirically, we can measure revaluation as the total return from announcement to the failure of the deal since the updating on the stand-alone values after observing the merger bid is not revised after (exogenous) deal failure.¹² As a result, the returns at the initial announcement are the weighted average payoffs upon merger completion (with probability p) and the standalone value (in case the deal fails, with probability $1 - p$).

Proposition 3 *The gross announcement returns $R_{A,i}$ for entity $i \in \{B, T\}$, satisfy*

$$R_{A,i}(C) > R_{A,i}(S) \quad (13)$$

where $R_{A,T}(a) = \frac{pP+(1-p)\hat{q}_T(a)}{\hat{q}_T(0)}$ and $R_{A,B}(a) = \frac{p(K_M\hat{q}_M(a)-PK_T)+(1-p)K_B\hat{q}_B(a)}{K_B\hat{q}_B(0)}$.

This means that the announcement return for both entities is higher in cash deals than in stock deals. Even if cash targets and stock targets are offered the same premium P (as is roughly the case in our sample), cash targets have a higher announcement return since their fall-back price upon deal failure, the updated stand-alone value, is higher.

II. Data

Our main source of data is the SDC Mergers and Acquisitions database, merged with stock market and accounting data from CRSP and Compustat. We focus on target returns in the sample of unsuccessful merger bids, but also analyze bidder returns and the causes of deal failure in the larger sample of all successful and unsuccessful merger bids. To research deal synopses and failure reasons, we run news searches in LexisNexis.

Our initial sample contains all merger agreements and tender offers between 1980 and 2008 that meet the following data requirements: First, we require a valid announcement

¹² From a theoretical perspective, it would be interesting to allow for endogenous merger cancelations. This is, however, beyond the scope of this paper.

date and a valid completion or failure date within 5 to 250 trading days after the announcement. Second, we exclude bids with competing offers, i.e., deals for which SDC reports a competing deal number, to avoid capturing returns to the competing bid.¹³ Third, we require a match in the merged CRSP/Compustat database. We use the six-digit CUSIP provided in the SDC database to merge the data. When matched with more than one CRSP CUSIP, we choose the CUSIP with the lowest 7th digit (typically 1). The initial sample consists of 7,078 successful and 3,182 unsuccessful bids.

For the regression analysis, we refine the data along four dimensions. First, we require two major deal characteristics, medium of exchange (cash, stock, and other) and deal premium. We extrapolate missing deal premia by regressing the available SDC premia on transaction values divided by the target's market capitalization one month prior to the bid, and predict out-of-sample premia based on transaction value and market capitalization (where available). This first data requirement reduces the sample of failed bids to 1,168 observations (993 without the extrapolation). As suggested by Officer (2003), we truncate deal premia below 0 and above 200%. Second, we require target stock data for at least 25 days prior to announcement and 25 days post-failure, which reduces the failed-bids sample to 1,024 observations. Third, we require acquirer stock data for the same +/- 25-day window, which reduces the sample to 345 observations.¹⁴ Finally, our regressions control for leveraged buy-outs, hostile bids, market value of equity, transaction value over market value of acquirer equity and acquirer and target q ratios, defined as the market value of equity plus assets minus the book value of equity all over assets. The additional controls reduce the sample to 249 unsuccessful merger bids (or 194 unsuccessful pure-cash or pure-stock deals). We will refer to this sample as the "regression sample." When we also include Kaplan and Zingales (1997) indices as a measure of

¹³ We refine the competing-bid flag in SDC based on our news search in LexisNexis. In several cases, our searches reveal competing bids that were not flagged in the SDC data, or indicate that a deal went through shortly after it was recorded as canceled in the SDC data.

¹⁴ Our empirical results continue to hold if we include bids by acquirers for whom stock (and other accounting) data is not available in CRSP/Compustat, i.e., excluding all control variables that require Compustat data for the acquirer and thus including private acquirers. (Tables available upon request.)

financial constraints, we yield 217 unsuccessful merger bids (171 of which are pure cash or pure stock deals). We use the four-variable version of the KZ index given in Lamont et al. (2001) and Baker et al. (2003):

$$KZ_{it} = -1.002 \frac{CF_{it}}{A_{i,t-1}} - 39.368 \frac{DIV_{it}}{A_{i,t-1}} - 1.315 \frac{C_{it}}{A_{i,t-1}} + 3.139 LEV_{it} \quad (14)$$

where CF_{it} , DIV_{it} , C_{it} , and LEV_{it} denote cash flows, cash dividends, cash balances, and leverage, respectively, and $A_{i,t-1}$ is the firm's lagged assets.

Summary Statistics. The summary statistics for the regression sample are in Table Ia, separately for successful and unsuccessful bids, and the statistics for the subsample of unsuccessful pure-cash and pure-stock bids are in Table Ib.¹⁵

Table Ia shows that completed and unsuccessful deals are similar along many dimensions, including the percentage of cash payment offered (the median is almost identical), the offer premium, the transaction value, and deal size. Successful and unsuccessful bids differ in the percentage of stock and other payment offered, with less stock and more other payments in successful deals. (We will see later that the difference in the percentage of stock is explained by other deal characteristics, most notably the log of the relative deal size.) We also see that deals take longer to be completed than to be withdrawn or rejected. LBOs and hostile deals are also less common among successful deals, while tender offers are more common. Not surprisingly, experienced and financially less constrained acquirers have a higher chance of being successful. Finally, there are marginally significant differences in the q ratio of the target and the likelihood of target and acquirer being in the same industry; both are higher among successful bids. Note, though, that there are no significant differences in the proportion of bids where the acquirer q is greater than the target q . Moreover, the acquirer q ratios and the target's KZ index do not vary significantly between the samples of successful and unsuccessful bids.

¹⁵ For completeness, we also show the characteristics of successful pure-cash and pure-stock bids in Table A.I of the Supplementary Appendix.

Table Ib provides more details on pure-cash and pure-stock deals within the subsample of unsuccessful bids. As can be seen from the number of observations, pure cash and stock deals add up to roughly four fifths of the total regression sample. There are only few significant differences between the two subsamples: Cash deals are more likely to be hostile or to be tender offers, and both the bidders and the targets have lower q ratios. There are no significant differences in the acquirer-to-target q ratios.

Failure Reasons. We categorize the failure reasons of unsuccessful deals based on the deal synopses in SDC and our detailed news search in LexisNexis.

Table II shows the main categories. The category “Alliance” denotes cases where bidder and target entered other types of cooperation instead of the merger. The next three categories “Price too low,” “Target rejection,” and “Target news,” summarize cases in which the deal failed due to a negative response of the target to the bid or because there was negative news about the target. Specifically, “Price too low” indicates that the parties could not agree on the transaction price. “Target rejection” indicates that target shareholders or the target board prevented the merger, for example by adopting poison pills, via a repurchase of shares by the target from the bidder (greenmail), or by deliberately breaching merger covenants. “Target news” usually refers to cases where the bidder discovered negative information about the target in the course of the due-diligence process. (One deal failed due to positive news about the target: In August 1996, US Diagnostic Labs called off the acquisition of Alliance Imaging because of a run-up in Alliance’s stock price.)

The next category, “Market problems,” summarizes failures due to real shocks affecting both the acquirer’s and the target’s industry, or even market-wide downturns, mostly the “October 1987” crash, “September 11,” and the subprime crisis.

The last five categories are all cases where deal failure can be interpreted as exogenous to the target’s stand-alone value, but not to the bidder’s. “Regulator” refers to lack of regulatory approval as revealed by our news searches, whereas “Regulator (SDC)”

are deals for which SDC (but not the news searches) indicates regulatory intervention. One example from our sample is General Electric’s proposed acquisition of Honeywell in October 2000. The deal was blocked by the European Commission, in a decision that deviated from the U.S. Department of Justice’s view.

We classify the failure reason as “Management terms” if target management and acquirer management cannot agree on organizational issues, such as the nomination of a CEO of the future company. “Bidder problems” summarizes failures due to financing problems of the bidder or other negative news about its business. “Bidder acquired” are sudden cancelations because the bidder itself became the target of an acquisition.

Note that multiple categories could be assigned to a single deal. We were unable to retrieve any information on the failure reason for 37 of 249 deals, and had no information beyond which party canceled the merger for another 52 deals.¹⁶

We will employ the classification of failure reasons to address potential endogeneity concerns affecting our identification and the interpretation of our results. To this end, we will re-estimate all regressions separately for each failure category as well as for all categories jointly where the cancelation was most likely to be orthogonal to the stand-alone value of the entity in question. We will denote as Sample *C* the subset of deals for which we have robust information about a failure reason that is exogenous with respect to target value, i.e., regulatory intervention (“Regulator” and “Regulator (SDC)”), disagreement on management terms or positions (“Management Terms”), and unexpected issues on the side of the bidder (“Bidder problems” and “Bidder acquired”). Alternatively, we use a larger but less restricted sample, Sample *N*, which only excludes bids whose failure was clearly endogenous to target value, i.e., cancelations due to Target news and Market problems. Since, as we will show, our coefficient estimates are very close in all subsamples (other than “Market problems”), our decision to label certain categories as exogenous will turn out to be of little importance.

¹⁶ This explains why the number of deals in Table II does not add up to (at least) 249 as in our regression sample.

III. Empirical Analysis

A. Identification

The idea behind our empirical approach is as follows. The change in the combined market values of bidder B and target T in response to a merger announcement can be decomposed into expected synergies S plus the revaluation of the hypothetical respective stand-alone entities $\Delta\tilde{V}_B$ and $\Delta\tilde{V}_T$:

$$\Delta V_B + \Delta V_T = S + \Delta\tilde{V}_B + \Delta\tilde{V}_T. \quad (15)$$

If a bid is successful, we observe only ΔV_B and ΔV_T ; the decomposition is not identified. If a bid fails, synergies are no longer priced and we observe $\Delta\tilde{V}_B$ and $\Delta\tilde{V}_T$. Moreover, if deal failure is exogenous to the target's stand-alone value, $\Delta\tilde{V}_T$ reflects updating about the target's value due to the bid. If deal failure is exogenous to the *bidder's* stand-alone value, $\Delta\tilde{V}_B$ reflects the updating about the bidder's value due to the bid. Finally, if deal failure is not exogenous with respect to stand-alone values, but there is no *differential* selection into the sample of failed cash and failed stock deals (i.e., deal failure is exogenous with respect to $\Delta V_T^{Cash} - \Delta V_T^{Stock}$), we can still extract the difference in revaluation due to the bid, $\Delta\tilde{V}_T^{Cash} - \Delta\tilde{V}_T^{Stock}$. We will entertain (and test) this weaker assumption when we analyze the full set of failed bids rather than the hand-collected data of exogenously failed deals.

In our analysis, we use the following measures of cumulative abnormal returns (CAR), buy-and-hold returns (BHR), and buy-and-hold abnormal returns ($BHAR$) to capture

changes in market values¹⁷:

$$CAR_{it} = \sum_{j=1}^t (r_{ij} - r_{mj}), \quad (16)$$

$$1 + BHR_{it} = \prod_{j=1}^t (1 + r_{ij}), \quad (17)$$

$$BHAR_{it} = \prod_{j=1}^t (1 + r_{ij}) - \prod_{j=1}^t (1 + r_{mj}), \quad (18)$$

where r_{ij} and r_{mj} denote firm i 's equity return and the CRSP value-weighted market return at time j , respectively. Our analysis focuses on the CAR , but our main finding is robust to using buy-and-hold returns, buy-and-hold abnormal returns, and to using industry rather than market returns for the specification of abnormal returns. Note that cumulative abnormal returns can be compared across deals with different window lengths as long as the underlying equilibrium asset pricing model is correctly specified. Moreover, due to the relatively short length of the event window (see summary statistics in Table Ia), the misspecification of the asset pricing model to compute “normal” returns is a second-order concern.¹⁸

B. Graphical Evidence

Figure 2 previews our key empirical result. It plots the evolution of cumulative abnormal returns for pure-stock and pure-cash failed merger bids in the US between 1980 and 2008, separately for acquirers and targets. The graph plots the returns from 25 days prior to the announcement to 25 days after failure. Deal failure is normalized to occur 50 synthetic trading days after the announcement of the initial bid, which corresponds

¹⁷ One would ideally measure the enterprise value of the firm, i.e., including the market value of debt. Given the difficulty of obtaining daily market values of debt, we follow the literature in using equity market values. Our approximation mistakes are likely of second order since debt is less sensitive to information.

¹⁸ See, e.g., Barber and Lyon (1997), Fama (1998), and Brav (2000) on the statistical issues involved when calculating long-run returns.

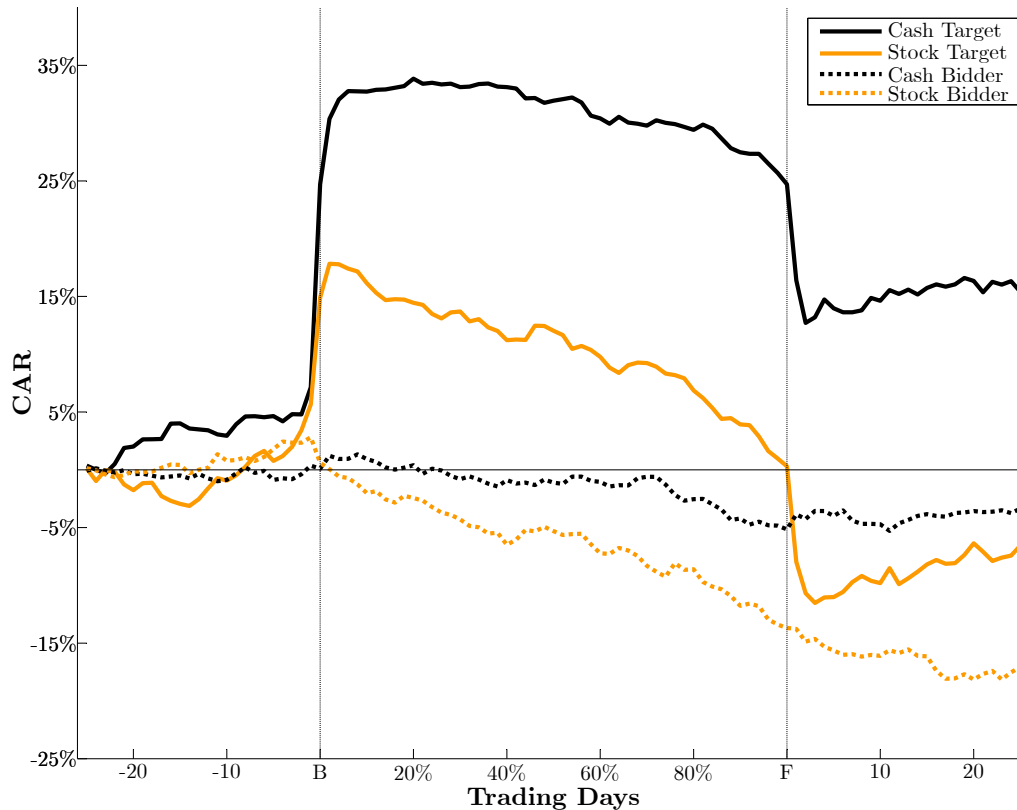


Figure 2. Announcement Effects at Bid and at Failure (+/- 25 days). Cumulative Abnormal Returns (CARs) from 25 trading days pre-announcement of the initial bid (B) to 25 trading days after deal failure (F). The sample consists of 86 cash and 108 stock deals.

to the median window length in our sample.¹⁹

The pre-announcement and post-failure differences are striking. Over the 25 trading days prior to the announcement, we observe a run-up among targets of both stock and cash offers, yielding announcement effects of 15% and 25%, respectively. Both effects are consistent with earlier evidence by Huang and Walkling (1987). At the time of deal failure, however, the value of stock targets falls below the pre-announcement level, to which it ultimately returns. The value of cash targets, instead, remains significantly higher than prior to the bid: Cash targets earn 15% cumulative abnormal returns relative to the pre-announcement level. Despite a small upward trend for both cash and stock targets after deal failure, stock targets remain more than 15% below cash targets. The

¹⁹ We use a linear interpolation to normalize deals with different window lengths to the same number of synthetic trading days; see Appendix B.

graph also reveals that stock acquirers trade at significantly lower prices post-failure (-17%) while cash acquirers return to their pre-announcement level, consistent with findings in previous studies.

The results are very similar when using a longer window, e.g., CARs running from 100 days pre-announcement and to 100 days post-failure in Figure A.1 of the Supplementary Appendix. Over the longer horizon, the cash-stock differential target values is even stronger, around 25% .

We confirm the results for the subsample of deals that firm for reasons exogenous to the value of the target in the next subsection.

C. Regression Analysis

We now test whether the graphical evidence holds up in a controlled regression environment and whether it is robust to the subset of cases where deal failure was exogenous to the stand-alone value of the target firm.

In Table III, we first regress the target CAR from 25 days before announcement of the bid until 25 days after failure, $CAR(B - 25, F + 25)$, on the fraction of cash offered without further controls, simply replicating the graphical evidence and providing (robust) standard errors. In the full sample (column 1), we estimate a cash coefficient of 20.5% , and in the pure-cash or pure-stock sample (column 4) a coefficient of 14.3% . The estimates are highly significant in both cases.

In the columns 2 (for the full sample) and 5 (for the pure sample), we add control variables for deal characteristics that are correlated with the medium of exchange and potentially reflect the target's stand-alone value.²⁰ Specifically, we control for the offer premium (over the target's share price one month prior to the bid) and the q ratio of the target. Moreover, we include leveraged buyouts, as these deals are naturally in cash and involve well-informed bidders. We also control for the disciplinary channel of hostile

²⁰ Further correlates of cash deals are investigated in Table A.II of the Supplementary Appendix.

bids, which are more likely to be in cash (see Table Ib) and might have a positive impact on target revaluation. We also include industry and year fixed effects. The coefficient estimates remain similar, 19.3% in the full sample and 22.8% in the pure sample. Note that, other than the medium of exchange, only the deal premium consistently matters for target CARs.

Finally, in columns 3 and 6 we include the full range of control variables as well as interactions of cash with the premium control and with the q ratio of the target. The cash coefficient more than doubles, although the interaction terms are (insignificantly and significantly) negative, resulting in a similar economic magnitude for the mean deal as before. It is also interesting to see that, while hostile mergers tend to be in cash, the hostility dummy loses its explanatory power for target revaluation in the subsample of pure cash and stock deals. Instead, the cash effect seems stronger for targets with low q ratios, both in the full and the pure sample. This may reflect the idea that the revaluation process is more emphasized for potentially undervalued targets once cash is offered for them.

We find the same results when using industry-adjusted abnormal returns, buy-and-hold abnormal returns, and buy-and-hold returns. As shown in Table IV, the raw cash effects in the subsample of pure cash and stock deals (cf. first, third, and fifth columns) match the magnitude encountered in Figure 2. And, as shown the remaining columns, the cash effect is also significant in the full regression model (of column 6 in Table III) for all three return definitions.

As the next step of the regression analysis, we restrict the sample to those cases where deal failure was plausibly exogenous to the stand-alone value of the firm. As outlined above in Section II, we use both the most restrictive sample, sample C , which consists of “regulatory intervention,” “news about the bidder,” and “disagreement on management terms,” and the less restrictive, but larger sample N , which excludes cases of “news about the target” and “market problems,” which (also) affect the target. The results are shown

in Table V. The small size of sample C allows us only to estimate the univariate results. As shown in column 1, the estimate is again very similar to the full-sample coefficient estimates, 24.0%, and significant at $p < 0.05$. For the larger sample N , we can estimate both the univariate results (column 2) and the the fully controlled regression (column 3) as in column 3 of Table III, as well as further restrict to pure deals (columns 5 and 6). In all instances, we estimate economically very similar and statistically significant coefficients.

As a further step in addressing concerns about the endogeneity of deal failure, we re-estimate the cash coefficient for every single failure category identified in our news searches. We show the resulting coefficient estimates separately for each failure category in the second column of Table II.

While the small sample size for each failure category restricts us to univariate regressions, the results further support our findings: except for the category “market problems,” the cash coefficient is always positive.²¹ The results also hold in the sample of 160 deals for which we have identified failure reasons and the remaining 89 deals for which we were unable to find information about the failure reason, as shown in the last two rows.

As a final step in the empirical analysis, we aim to shed more light on the robustness of our results among exogenous and endogenous failure categories. One interpretation discussed above is that, even in cases where deal failure is endogenous, there is no differential selection between stock and cash deals. In other words, endogeneity affects stock and cash deals equally and hence does not affect the (differential) cash effect. One necessary condition for this interpretation to hold is that the use of cash as the medium of exchange does not predict deal failure.

In an auxiliary analysis, we estimate a linear probability model for deal failure as a function of a continuous cash variable, which indicates the fraction of payment offered in cash. The results are presented in Table VI. The impact of the medium of exchange

²¹ During market crashes the revaluation estimates for individual companies are extremely volatile, despite the adjustment for the market return

on deal failure is insignificant, regardless of the set of controls included, whereas the relative deal size is a major determinant of deal failure. Not surprisingly, hostile deal announcements are also less likely to be successful. In column 4, we include the target’s announcement return for the bid, $CAR(B - 25, B + 1)$, in addition to our usual set of controls. The additional controls should capture market expectations of deal failure that are based on all other publicly available information at the time of the announcement (but are unavailable to the econometrician).²² Again, the cash coefficient remains insignificant. Our results are also robust to reducing our sample to the subset of pure cash and stock deals only (cf. Table A.III of the Supplementary Appendix).

Another potential selection concern is that cash and stock deals fail differentially with respect to post-announcement news. In particular, one might be worried that good news about the target might cause cash deals to fail more likely because a financially constrained bidder is unable to increase his bid in cash (leading to failure).²³ We address this in the first regression specification of Table VII which includes the acquirer’s KZ index for financial constraints compared to the third column in Table III. The interaction of the medium of exchange with the acquirer’s KZ index is insignificant. We also control for the target’s KZ index, as its financial constraints might impact its attractiveness to potential buyers, but the respective coefficient is not significant either.

²² The announcement return should approximately be given by the return captured if the deal goes through, i.e., the premium, weighted by the probability of a successful takeover, p , plus the return that results from learning if the deal does not go through, i.e., $CAR_T(a) \approx p \cdot \text{Premium} + (1 - p) \cdot \text{Learning}(a)$ where $a \in \{cash, stock\}$ denotes the medium of exchange. Since we control for the premium and learning encoded in the choice of the medium of exchange, variations in CAR should capture variations in the deal probability.

²³ Empirically, we could only identify one instance in which good news about the target led to deal failure. The remaining target news identified in Table II were negative.

IV. Economic Significance and Channels

A. Revaluation Channels

A.1. Future Takeover Activity

Our results so far suggest that a cash bid reveals private information of the bidder about the target. One interpretation is that our estimates reflect information about common synergy components that could be potentially tapped by other bidders. In other words, rather than revealing a higher stand-alone value, a cash bid may reveal that a target is a particularly attractive takeover object. In the latter case, our revaluation estimates should be driven by (expected) future takeover activity (as found by Davidson et al. (1989)). We investigate this possibility by checking, first, whether cash targets are more likely to be taken over in the future and, second, whether they are able to capture higher future take-over premia.

In Table VIII, we analyze the determinants of future merger bids occurring within the next two years (and after at least half a year, to avoid capturing bidding wars).²⁴ Going from column 1 to 4, we include an increasing number of controls, mirroring our previous return regressions. In all specifications, we find that cash targets are not more likely to receive future merger bids. We also see that targets with low q ratios are significantly more likely to become targets in the future. In column 5, we also include target $CAR(B - 25, F + 25)$ as an additional independent variable in order to test directly whether the revaluation effect, i.e., the total return from announcement to failure, captures future merger activity. We find no such evidence. Finally, our results are also robust to considering the subset of pure cash and stock deals only (cf. Table A.V of the Supplementary Appendix).

Turning to future takeover premia, rather than takeover frequencies, as the possible

²⁴ Our results are robust to other specifications of the grace period (such as one month, six weeks, or three months).

channel, we also replace the dependent variable by the actual takeover premium in future deals (and zero otherwise), and consider OLS regressions with the same set of control variables as before. The results in Table A.VI (and Table A.VII) of the Supplementary Appendix demonstrate that cash targets do not receive significantly higher future takeover premia (for the subsample of pure cash and stock deals). We therefore conclude that the positive impact of cash offers on post-failure target CARs is not driven by future merger activity.

A.2. Undermanagement

Another interpretation of our result is that cash bids signal “undermanagement,” rather than undervaluation, and motivate target management to improve their company’s performance. While the undervaluation interpretation suggests that a cash bid *signals* better operating performance of the target, the undermanagement story implies that the cash bid *induces* better operating performance. In both instances a bidder is more likely to choose cash to prevent the target shareholders from partially participating in the upside.

An actual improvement of operating performance of an undermanaged target may be achieved through either 1) superior management skills of the bidder or 2) a reduction in target managerial slack present at the time of the bid. Since we focus on failed deals, superior management skills of the bidder are unlikely to be the source of operational improvement. However, it is conceivable that even existing target management may improve operational performance simply due to the disciplinary effect of a merger bid. Hence, for undermanagement to explain our results, cash and stock bids would need to have differential disciplinary effects. Since cash bids are more likely to be hostile bids (see Table A.II), which are usually associated with disciplinary pressure, such a differential effect is plausible.²⁵ However, we also find that the effect of cash on post-failure target

²⁵ Consistent with this line of reasoning, Mikkelson and Partch (1997) provide evidence of the positive relationship between takeover activity and top-management turnover during the hostile-merger wave in the 1980s.

CARs remains significant even after controlling for hostile and LBO bids (see Tables III and VII). Thus, unless one interprets the cash variable as a better proxy for the disciplinary channel than “hostility,” this evidence points in favor of the undervaluation explanation rather than any disciplinary effect of cash bids. Anecdotally, one of the most prominent value investors in our sample with a series of well-performing cash acquisitions, Warren Buffett, famously tends to seek out “undervalued,” well-managed companies rather than undermanaged ones.

Finally, we aim to test directly for (observable) operational changes of the target as a response to a (failed) takeover bid. One prominent restructuring activity that may be induced by a disciplining bid is recapitalization (as measured by the change in the target’s leverage ratio). This may be interpreted as a way to reduce managerial slack (Jensen and Meckling (1976)) or evidence that target managers lever up to deter (further) takeover attempts, as described in Hirshleifer and Thakor (1992).²⁶

We regress post-failure changes in the target’s debt on cash and the usual host of additional controls (see Table A.VIII of the Supplementary Appendix). The estimates reveal that hostile bids and LBOs are associated with greater changes in target leverage, though the effects are, however, not significant in all specifications. Most importantly, cash does not predict levering up.

A.3. Information Sources

Can we provide direct evidence on the informational channel? In this subsection, we relate revaluation to a number of information proxies and analyze how these proxies interact with cash. The ideal information proxy should capture variation in the probability of being informed, ρ , but not variation in any other relevant variables. Such proxies for *private* information are naturally difficult to obtain. Empirically, we use 1) whether the bidder is in the same industry (according to the 2-digit SIC code), 2) whether the bidder

²⁶ While the first explanation is most likely associated with a value increase, the second rationale is presumably either value-neutral or destructive.

has a toehold in the target, 3) is an experienced acquirer, and 4) whether he has a large cash balance to spend. The first three proxies should be positively associated with the probability of an informed bidder, i.e., have positive interaction coefficient with cash. In contrast, the “cash balance” proxy should be negatively related to ρ , i.e., a negative interaction term. Intuitively, a cash-constrained acquirer should be more selective in choosing targets in a cash deal than an acquirer with a large cash balance.

The results are presented in the second to fifth columns of Table VII. The within-industry (horizontal) merger dummy does not seem to drive revaluation in itself or via the interaction with cash. Our second proxy is given by the toehold, indicating whether the bidder has an initial stake in the target before launching the bid. It seems natural that a bidder can more likely obtain private information if he already possesses a stake in the company (see also Betton et al. (2009)). The individual effect of the toehold variable is positive, and the interaction effect with cash is negative at a lower absolute value.²⁷ Thirdly, we find that the intercept for experienced acquirers is significantly negative (−23.5%), whereas the interaction with cash is positive with similar absolute magnitude (18.8%), though not statistically significant. Similarly, we find that the baseline effect of the cash balance to be significantly positive (3.6%), whereas the interaction effect is negative with similar magnitude (−2.9%), but not significant. Overall, the evidence on information proxies is therefore mixed as only the last two proxies have the hypothesized sign. This might also reflect the idea that these proxies do not capture variation in ρ well or simultaneously affect other variables relevant for revaluation.

Similarly to the last information proxy, cash balance, the decision to use cash vs. stock might also reflect accounting interests (see Section 3.2 in Betton et al. (2008)). Until 2001, an accounting motivation for stock deals used to be the pooling-of-interests method (valid until 2001) in order to avoid the creation and subsequent amortization

²⁷ These effects are even stronger in the subsample of pure cash and stock deals (cf. Table A.IV of the Supplementary Appendix).

of goodwill (as required under the purchase method of accounting).²⁸ This “accounting incentive” implies two opposing effects on target revaluation. On the one hand, it induces the bidder to make a stock bid for a target, for which it otherwise would not have made an offer at all, i.e., targets with low q_T . On the other hand, the accounting incentive also favors the use of stock vs. cash, even for good targets, i.e., targets with high q_T .

Empirically, we try to address this in the following way. As goodwill is increasing in the offer premium, we interact the interaction between the premium and our cash variable with a dummy for the two decades (the 1980s and 1990s) in which paying a high premium in stock might not necessarily have been a sign of joint overvaluation. Indeed, in the last column of Table VII, we find that the triple interaction is significantly negative, indicating that targets of stock offers involving high premia in the 1980s and 1990s were not as overvalued as the more recent ones in the 2000s. Note that the intercept effect of cash offers on post-failure target CARs remains robust.

B. Implications for the Returns to Mergers

Our estimates of large revaluation effects imply that stock-market-based estimates of the causal effect of mergers in successful deals might be significantly biased and that the direction of the bias depends on the medium of exchange offered. We provide a back-of-envelope calculation for the adjustment needed when calculating returns to mergers.

We first compute the average joint announcement return of the bidder and the target on the $[-25, 1]$ window for the sample of successful deals separately for all cash and all stock deals. For the purpose of computing our revaluation estimates, we restrict ourselves to our most conservative estimates, i.e., based on Sample *C* for targets (cf. Section II).²⁹ To arrive at joint revaluation estimates, which can be compared to the joint announcement returns, we also need to compute the bidder-revaluation effect separately

²⁸ See Lys and Vincent (1995) for an extreme case – AT&T’s acquisition of NCR – of the bidder’s interest in having the acquisition qualify as a pooling of interests.

²⁹ The estimates for our full sample are somewhat larger and might be subject to the concern of an upward bias, i.e., entities with extraordinary revaluation relative to the sample of completed deals.

for cash and stock deals (see Table A.IX of the Supplementary Appendix for bidder estimates). Following the logic of the construction of Sample *C*, we only include deals that are exogenous to the bidder’s stand-alone value, i.e., deal failures due to regulatory intervention, target news, and disagreement on management terms/positions. Due to the small sample size of 82 deals (76 deals for targets), we solely reproduce the analogous bidder specification from the first column of Table V. The respective regression estimates are shown in the last column of Table A.IX of the Supplementary Appendix and imply a revaluation estimate of -1.1% for pure cash bidders and -16.7% for pure stock bidders (the difference is significant at the 8% level). We use these estimates in conjunction with the target-revaluation estimate from the first column of Table V and the average relative size of the bidder and the target in the sample of successful pure-cash and pure-stock deals to compute the average estimated joint revaluation. The following table provides an overview of joint announcement returns, revaluation estimates, and implied synergies for different target sizes (measured as a fraction of the joint market capitalization).

	Cash deals			Stock deals		
Minimum target size	0%	10%	30%	0%	10%	30%
Announcement return	4.9%	10.0%	15.3%	3.8%	5.0%	6.7%
Revaluation estimate	0.2%	2.0%	4.1%	-16.4%	-16.1%	-15.8%
Synergies s	4.7%	8.0%	11.2%	20.2%	21.1%	22.5%
N	1,019	370	135	1,232	677	252

Given that the revaluation in cash deals is driven primarily by targets, the explanatory power of the revaluation effect for the announcement return is increasing in the relative target size, and ranges from 4% to 27% (when restricting deals to those involving targets that make for at least 30% of the total market capitalization). Even for targets as small as 10% of the total market capitalization, the revaluation effect accounts for one-fifth of the joint announcement return, which implies that synergy estimates based on announcement returns of cash deals might be significantly upward biased. Conversely, for stock deals,

we find that announcement returns lead to an underestimation of synergies by as much as 16 percentage points.

V. Conclusion

We have shown that the medium of exchange in merger bids reveals economically and statistically significant information about the target: targets of cash offers trade 15% above pre-announcement levels, whereas targets of stock offers are not revalued upwards. Prior literature has primarily focused on information revealed about the bidder. Our findings imply that, when assessing the value of merger transactions, it is important to account for the implied target revaluation.

Building on the findings of this paper, an important next step would be the generalization of our results to completed deals along the lines of our back-of-the-envelope calculation provided in Section IV.B. Given the estimates from “exogenous-failure” cases (and ideally exploiting additional sources of clean identification), it might be possible to build a structural model that allows to jointly estimate the endogenous deal-withdrawal selection, information revelation, and value creation for cash and stock transactions. Such an analysis would deepen our understanding of these important company decisions, and would help quantify the economic benefits of mergers.

Appendix A. Proofs

Proof of Proposition 1: We start from the conditional choice of cash versus stock. Since the failure probabilities and payoffs are the same for cash and stock bids, the bidder only needs to compare the long-run market value of shares owned by the bidder's shareholders upon a completed deal, i.e., $q_M K_M - PK_T$ if $a = C$ and $(1 - x)q_M K_M$ if $a = S$. Hence, the bidder chooses stock if and only if:

$$\left(1 - \frac{PK_T}{(\hat{q}_{wa}(S) + s)K_M}\right) (q_{wa} + s)K_M \geq (q_{wa} + s)K_M - PK_T.$$

Simple algebra yields inequality (4). Comparing the long-run values upon completion and in case of no bid, $q_B K_B$, delivers the decision to make a bid. ■

Proof of Proposition 2: In order to determine the direction of the updating, we simply have to determine the updating process conditional on an informed offer, $\mathbb{E}(q_i | a, B)$. If $\mathbb{E}(q_i | a, B) > \hat{q}_i(0)$ then $\hat{q}_i(a) = \rho \mathbb{E}(q_i | a, B) + (1 - \rho) \hat{q}_i(0) > \hat{q}_i(0)$ and, thus, if $\mathbb{E}(q_i | C, B) > \mathbb{E}(q_i | S, B)$ then $\hat{q}_i(C) > \hat{q}_i(S)$.

To determine $\mathbb{E}(q_i | a, B)$ we first characterize the relevant boundaries for the optimum action a (see Figure 1). Define $k_B = \frac{K_B}{K_M}$ and $k_T = \frac{K_T}{K_M}$. Proposition 1 implies that an informed bidder makes a **stock** bid if and only if:

$$q_B k_B + q_T k_T \leq \hat{q}_{wa}(S) \tag{19}$$

$$x q_B k_B - (1 - x) q_T k_T \leq (1 - x) s \tag{20}$$

This can be written as simple linear constraints on q_B and q_T

$$q_T \leq c - a q_B \tag{21}$$

$$q_T \geq -f + e q_B \tag{22}$$

where $a = \frac{k_B}{k_T} > 0$, $c = \frac{\hat{q}_{wa}(S)}{k_T} > 0$, $e = \frac{Pk_B}{\hat{q}_{wa}(S)+s-Pk_T} > 0$ and $f = \frac{s}{k_T} > 0$. Similarly, a bidder makes a **cash** bid iff:

$$q_T > c - aq_B \quad (23)$$

$$q_T \geq d \quad (24)$$

where $d = P - \frac{s}{k_T} > 0$.³⁰

Since $q_T \geq 0$, we can solve for the cutoff value in q_B for which $-f + eq_B \leq 0$, i.e.,

$$q_B^* = \frac{f}{e} \quad (25)$$

Moreover, we can solve for the cut-off value of q_B for which stock-offers are always dominated by cash offer, i.e., $c - aq_B = -f + eq_B$ or:

$$q_B^{**} = \frac{c + f}{a + e} = \frac{c - d}{a} \quad (26)$$

Since $d > 0$, we immediately have $q_B^{**} > q_B^*$. Thus, an informed bidder chooses action $a \in \{C, S, N\}$ with the following probabilities (determined by regions in Figure 1):

$$\Pr(C|B) = \int_0^{q_B^{**}} \int_{c-aq_B}^{\infty} f(q_B, q_T) dq_B dq_T + \int_{q_B^{**}}^{\infty} \int_d^{\infty} f(q_B, q_T) dq_B dq_T \quad (27)$$

$$\Pr(S|B) = \int_0^{q_B^*} \int_0^{c-aq_B} f(q_B, q_T) dq_B dq_T + \int_{q_B^*}^{q_B^{**}} \int_{eq_B-f}^{c-aq_B} f(q_B, q_T) dq_B dq_T \quad (28)$$

$$\Pr(N|B) = 1 - \Pr(C|B) - \Pr(S|B) \quad (29)$$

³⁰ We implicitly assume that the price paid for the target is greater than just the synergies, but smaller than the value of the combined entity, i.e., $(\hat{q}_{wa}(S) + s)K_M > PK_T > sK_M$.

Then:

$$\mathbb{E}(q_i|C, B) = \frac{\int_0^{q_B^{**}} \int_{c-aq_B}^{\infty} q_i f(q_B, q_T) dq_B dq_T + \int_{q_B^{**}}^{\infty} \int_d^{\infty} q_i f(q_B, q_T) dq_B dq_T}{\Pr(C|B)} \quad (30)$$

$$\mathbb{E}(q_i|S, B) = \frac{\int_0^{q_B^*} \int_0^{c-aq_B} q_i f(q_B, q_T) dq_B dq_T + \int_{q_B^*}^{q_B^{**}} \int_{eq_B-f}^{c-aq_B} q_i f(q_B, q_T) dq_B dq_T}{\Pr(S|B)} \quad (31)$$

Thus, since target cash offers are made if $q_T > c - aq_B$ and $q_T \geq d$, we obtain:

$$\mathbb{E}(q_T|C, B) > \mathbb{E}(q_T|q_T > d) > \hat{q}_T(0) \quad (32)$$

Moreover, for stock bidders:

$$\mathbb{E}(q_B|S, B) < \mathbb{E}(q_B|q_B < q_B^{**}) < \hat{q}_B(0) \quad (33)$$

For the following statements, we use the assumption of independent distributions. For cash bidders, we have that $\mathbb{E}(q_B|C, B) > \hat{q}_B(0)$ because conditioning on a cash offer, the region $q_B < q_B^{**}$ is undersampled because of the tighter restriction on q_T , i.e., $q_T > c - aq_B \geq d$ vs. $q_T \geq d$ (for $q_B > q_B^{**}$). Moreover, it follows that:

$$\mathbb{E}(q_T|S, B) < \mathbb{E}(q_T|q_T > -f + e \min(q_B, q_B^{**})) < \mathbb{E}(q_T|q_T > d) < \mathbb{E}(q_T|C, B) \quad (34)$$

■

Proof of Proposition 3: The announcement return for the target is given by the weighted average of the payoffs under completion and the fall-back value:

$$R_{A,T}(a) = \frac{pP + (1-p)\hat{q}_T(a)}{\hat{q}_T(0)} \quad (35)$$

Thus,

$$R_{A,T}(C) - R_{A,T}(S) = (1-p) \frac{\hat{q}_T(C) - \hat{q}_T(S)}{\hat{q}_T(0)} > 0 \quad (36)$$

Since $\hat{q}_T(C) - \hat{q}_T(S) > 0$ by Proposition 2, the result immediately follows.

Similarly, the announcement return for the bidder is given by the weighted average of the payoffs under completion and the fall-back value:

$$R_{A,B}(a) = \frac{p(K_M \hat{q}_M(a) - PK_T) + (1-p)K_B \hat{q}_B(a)}{K_B \hat{q}_B(0)} \quad (37)$$

Thus,

$$R_{A,B}(C) - R_{A,B}(S) = p \frac{K_M}{K_B} \frac{\hat{q}_{wa}(C) - \hat{q}_{wa}(S)}{\hat{q}_B(0)} + (1-p) \frac{\hat{q}_B(C) - \hat{q}_B(S)}{\hat{q}_B(0)} \quad (38)$$

Since $\hat{q}_{wa}(C) - \hat{q}_{wa}(S) > 0$ and $\hat{q}_B(C) - \hat{q}_B(S) > 0$ by Proposition 2, the result immediately follows. ■

Appendix B. Linear Approximation

The time interval between announcement of the initial bid and failure of the deal varies across the sample. For the graphical illustration, we normalize this window to 50 synthetic trading days. Each synthetic trading day corresponds to $\frac{1}{50} = 2\%$ of the actual time elapsed between initial bid and failure. The cumulative abnormal returns of deal i with (actual) window length T_i after \hat{n} synthetic trading days are thus equal to the CAR after n actual trading days, where $n = \hat{n} \frac{T_i}{50}$:

$$\widehat{CAR}_i(\hat{n}) = CAR_i(n). \quad (39)$$

For example, the CAR after 10 synthetic trading days, $\widehat{CAR}_i(10)$, for a deal with $T_i = 100$, are equal to the CAR after 20 actual trading days. If n is not an integer number, we use a linear approximation between the relevant integer numbers, i.e.,

$$\widehat{CAR}_i(\hat{n}) = (1 - w_{(i,n)}) CAR_i(\lfloor n \rfloor) + w_{(i,n)} CAR_i(\lfloor n \rfloor + 1) \quad (40)$$

where $w_{(i,n)} = n - \lfloor n \rfloor$ and $\lfloor x \rfloor$ refers to the floor function. Hence, for a deal with $T_j = 10$, the CAR after 8 synthetic trading days is given by: $\widehat{CAR}_j(8) = \frac{2}{5} CAR_j(1) + \frac{3}{5} CAR_j(2)$ as $n = \hat{n} \frac{T_j}{50} = 8 \times \frac{10}{50}$ and $w_{(j,n)} = \frac{8}{5} - 1$.

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Table 1a

Summary Statistics – All Bids

Time to completion/failure is in trading days. Transaction values in 2010 \$bn are based on historical transaction values, converted using Consumer Price Index (CPI) Conversion Factors. Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. Hostile deal, LBO, and Tender offer are dummy variables indicating hostile bids, leveraged buy-outs, and tender offers, respectively. q ratio is the market value of equity plus assets minus the book value of equity all over assets. KZ index is the four-variable version as, e.g., in Lamont et al. (2001). New deal announced within 2 years (dummy variable) is conditional on the deal being announced at least half a year after the previous one. Experienced acquirers (dummy variable) appear at least five times in the data set. Same industry is an indicator variable for whether target and bidder operate in the same industry, as defined by the respective SIC codes. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. The sample is restricted to bids for which all control variables are available except for New deal announced within 2 years (220 observations in the unsuccessful-deals sample), KZ of acquirer (1,819 successful deals and 227 unsuccessful deals), and KZ of target (1,829 successful deals and 233 unsuccessful deals).

Variable	Successful Bids				Unsuccessful Bids				p-value
	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max	
Cash in %	46.90	45.77	0	100	44.31	45.79	0	100	0.401
Stock in %	45.75	45.56	0	100	55.23	45.85	0	100	0.002
Other payment in %	7.35	18.15	0	100	0.45	5.78	0	100	0.000
Time to completion/failure	76.90	43.80	5	245	63.68	48.26	5	238	0.000
Transaction value in 2010 \$bn	1.41	4.24	0.00	70.51	1.59	6.86	0.01	77.04	0.567
Target size in 2010 \$bn	0.91	2.93	0.00	65.16	1.25	5.46	0.00	56.04	0.126
Relative deal size	1.48	24.68	0.00	830.22	1.11	2.19	0.00	17.57	0.813
Offer premium in %	45.62	38.47	0	200	45.78	42.51	0	200	0.950
Hostile deal in %	1.64	12.72	0	100	13.65	34.41	0	100	0.000
LBO in %	0.10	3.20	0	100	0.80	8.94	0	100	0.015
Tender offer in %	24.60	43.08	0	100	10.84	31.16	0	100	0.000
q of acquirer	2.44	2.37	0.51	15.20	2.32	2.52	0.51	15.20	0.432
q of target	2.03	1.71	0.50	9.91	1.84	1.58	0.50	9.91	0.094
q of acquirer > q of target in %	62.15	48.51	0	100	59.84	49.12	0	100	0.480
KZ of acquirer	-0.09	1.47	-10.46	3.73	0.12	1.46	-5.26	3.73	0.044
KZ of target	0.12	1.68	-10.05	5.22	0.23	1.51	-6.44	4.28	0.347
Experienced acquirer in %	81.61	38.75	0	100	69.88	45.97	0	100	0.000
% of target sought	95.07	17.25	1.80	100	93.89	16.55	15.40	100	0.307
New deal announced within 2 years in %	n/a	n/a	n/a	n/a	23.18	42.30	0	100	n/a
Same industry (1 digit SIC) in %	75.04	43.29	0	100	70.68	45.61	0	100	0.138
Same industry (2 digits SIC) in %	61.43	48.69	0	100	55.82	49.76	0	100	0.088
N	1,947				249				

Table Ib
Summary Statistics – Unsuccessful Bids

Time to failure is in trading days. Transaction values in 2010 \$bn are based on historical transaction values, converted using Consumer Price Index (CPI) Conversion Factors. Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. Hostile deal, LBO, and Tender offer are dummy variables indicating hostile bids, leveraged buy-outs, and tender offers, respectively. q ratio is the market value of equity plus assets minus the book value of equity all over assets. KZ index is the four-variable version as, e.g., in Lamont et al. (2001). New deal announced within 2 years (dummy variable) is conditional on the deal being announced at least half a year after the previous one. Experienced acquirers (dummy variable) appear at least five times in the data set. Same industry is an indicator variable for whether target and bidder operate in the same industry, as defined by the respective SIC codes. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. The sample is restricted to bids for which all control variables are available except for New deal announced within 2 years (69 pure-cash and 102 pure-stock deals), KZ of acquirer (78 pure-cash and 102 pure-stock deals), and KZ of target (78 pure-cash and 104 pure-stock deals).

Variable	Cash Bids				Stock Bids				p-value
	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max	
Time to failure	61.65	45.42	5	188	58.83	46.72	5	232	0.673
Transaction value in 2010 \$bn	0.67	1.45	0.01	8.88	1.32	5.63	0.01	55.64	0.296
Target size in 2010 \$bn	0.45	0.79	0.00	4.09	1.36	5.61	0.00	56.04	0.140
Relative deal size	1.17	2.26	0.00	11.42	0.80	1.15	0.01	8.49	0.150
Offer premium in %	51.66	38.43	0	200	43.94	43.18	0	200	0.196
Hostile deal in %	26.74	44.52	0	100	3.70	18.97	0	100	0.000
LBO in %	2.33	15.16	0	100	0	0	0	0	0.112
Tender offer in %	24.42	43.21	0	100	1.85	13.54	0	100	0.000
q of acquirer	1.72	1.57	0.51	13.72	2.88	3.09	0.58	15.20	0.002
q of target	1.47	1.23	0.50	9.91	2.24	1.80	0.55	9.91	0.001
q of acquirer $>$ q of target in %	61.63	48.91	0	100	57.41	49.68	0	100	0.555
KZ of acquirer	0.16	1.38	-3.51	3.41	0.03	1.53	-4.55	3.73	0.567
KZ index target	0.30	1.12	-2.29	2.90	0.00	1.74	-6.44	4.28	0.183
Experienced acquirer in %	65.12	47.94	0	100	70.37	45.88	0	100	0.438
% of target sought	92.36	17.40	15.40	100	93.97	17.15	19.10	100	0.519
New deal announced within 2 years in %	26.09	44.23	0	100	19.61	39.90	0	100	0.320
Same industry (1 digit SIC) in %	76.74	42.49	0	100	71.30	45.45	0	100	0.394
Same industry (2 digits SIC) in %	56.98	49.80	0	100	57.41	49.68	0	100	0.952
N	86				108				

Table II
Failure Categories

The category Alliance denotes failed deals where bidder and target entered other cooperations. Price too low indicates that the parties could not agree on the transaction price. Target rejection refers to deals that failed because the shareholders and/or management or board refused the bid. Target news to failed deals where the acquirer discovered (good or bad) information in the due-diligence process. Market problems denotes deal failure due to shifting market conditions (typically stock market plunges). Regulator refers to deal failure where the news search revealed lack of regulatory approval, whereas Regulator (SDC) are deals for which SDC (but no other retrievable source of news) indicates regulatory intervention. Management terms describes all failed deals where acquirer and target were unable to agree on terms other than the price (e.g., the nomination of a CEO of the future company). Bidder problems summarizes deal cancelations due to financing problems or other bad news on the part of the bidder. Bidder acquired are sudden cancelations triggered by the acquisition of the bidder. The column entitled Average average percentage of the transaction value offered in cash. The columns Cash coefficient target and Cash coefficient acquirer show the coefficient estimates from regressing, respectively, the target's or the acquirer's CAR from 25 days before announcement to 25 days after deal failure on the fraction offered in cash.

Failure reason	Avg. % cash	Cash coeff. target	Cash coeff. acquirer	N
Alliance	35.9%	0.146	0.247	11
Price too low	54.4%	0.209*	0.049	28
Target rejection	59.0%	0.235	0.087	28
Target news	37.8%	0.367	0.100	29
Market problems	39.4%	-0.387	0.526**	21
Regulator	50.6%	0.368*	0.162	21
Regulator (SDC)	46.2%	0.279*	0.310**	28
Management terms	35.4%	0.105	0.204	14
Bidder problems	20.5%	0.090	0.787*	22
Bidder acquired	33.3%	0.789	0.422	3
All bids with identified failure reason	43.2%	0.155*	0.244***	160
All bids (regression sample)	44.3%	0.205***	0.132**	249

Table III
Target Returns

OLS regressions with target CAR from 25 days before announcement to 25 days after deal failure as the dependent variable. The sample All consists of all unsuccessful bids, the sample Pure of all unsuccessful pure cash and stock bids. Cash is expressed as a fraction of the total payment (and hence equal to a dummy for cash in the sample of pure cash and stock deals (Pure) in the last three columns). Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	Target CAR (B-25, F+25)					
Cash	0.205*** (0.07)	0.193** (0.08)	0.464*** (0.17)	0.143*** (0.05)	0.228** (0.10)	0.552*** (0.20)
Log(target size)			-0.031 (0.02)			-0.038* (0.02)
Log(relative deal size)			0.011 (0.02)			0.007 (0.02)
Offer premium		0.347*** (0.11)	0.398*** (0.10)		0.337** (0.14)	0.372*** (0.11)
Hostile		0.119* (0.07)	0.133* (0.07)		0.001 (0.10)	0.028 (0.10)
LBO		0.236 (0.19)	0.273 (0.21)		0.305 (0.29)	0.353 (0.31)
q of acquirer			0.022 (0.02)			0.031 (0.02)
q of target		-0.010 (0.02)	0.009 (0.03)		-0.004 (0.03)	0.017 (0.03)
Cash \times Premium			-0.223 (0.24)			-0.228 (0.25)
Cash \times q of target			-0.090** (0.04)			-0.118** (0.05)
Industry & year FE	N	Y	Y	N	Y	Y
Sample	All	All	All	Pure	Pure	Pure
N	249	249	249	194	194	194

Table IV
Target Returns – Alternative Return Specifications

OLS regressions with industry-adjusted target CAR (first two columns), buy-and-hold abnormal return (third and fourth columns), and buy-and-hold return (last two columns) from 25 days before announcement to 25 days after deal failure as the dependent variable. The sample consists of all unsuccessful pure cash and stock bids. Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	ICAR (B-25, F+25)		BHAR (B-25, F+25)		BHR (B-25, F+25)	
Cash $\in \{0, 1\}$	0.197***	0.548***	0.201***	0.296*	0.209***	0.351**
	(0.07)	(0.19)	(0.07)	(0.15)	(0.07)	(0.15)
Log(target size)		-0.039*		-0.008		-0.002
		(0.02)		(0.02)		(0.02)
Log(relative deal size)		0.007		-0.006		-0.011
		(0.02)		(0.02)		(0.02)
Offer premium		0.390***		0.016		0.069
		(0.11)		(0.16)		(0.15)
Hostile		0.016		0.203**		0.205**
		(0.11)		(0.09)		(0.09)
LBO		0.204		0.513		0.580
		(0.29)		(0.34)		(0.35)
q of acquirer		0.032		-0.015		-0.016
		(0.02)		(0.02)		(0.02)
q of target		0.018		0.064**		0.061*
		(0.03)		(0.03)		(0.03)
Cash \times Premium		-0.284		0.164		0.100
		(0.24)		(0.22)		(0.22)
Cash $\times q$ of target		-0.107**		-0.146***		-0.152***
		(0.04)		(0.05)		(0.05)
Industry & year FE	N	Y	N	Y	N	Y
N	194	194	194	194	194	194

Table V
Target Returns – Exogenous Failure Reasons

OLS regressions with target CAR from 25 days before announcement to 25 days after deal failure as the dependent variable. Sample *C* consists of all deals that were canceled due to (potential) regulatory intervention (i.e., even if only indicated in the SDC deal synopsis), bidder news, or disagreement on management terms. Sample *N* is limited to all bids that were not withdrawn due to market problems or news regarding the target. Cash is expressed as a fraction of the total payment (and hence equal to a dummy for cash in the sample of pure cash and stock deals (Pure) in the last two columns). Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. All non-deal-related variables (e.g., *q* ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all *q* variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	Target CAR (B-25, F+25)				
Cash	0.240**	0.225***	0.311**	0.220***	0.320**
	(0.10)	(0.07)	(0.13)	(0.07)	(0.15)
Log(target size)			-0.031		-0.038
			(0.02)		(0.02)
Log(relative deal size)			0.017		0.015
			(0.02)		(0.02)
Offer premium			0.339***		0.281***
			(0.10)		(0.10)
Hostile			0.059		-0.037
			(0.07)		(0.10)
LBO			0.286		0.297
			(0.19)		(0.29)
<i>q</i> of acquirer			0.004		0.010
			(0.03)		(0.03)
<i>q</i> of target			0.018		0.018
			(0.04)		(0.04)
Cash × Premium			0.044		0.104
			(0.16)		(0.20)
Cash × <i>q</i> of target			-0.082*		-0.084*
			(0.04)		(0.04)
Industry & year FE	N	N	Y	N	Y
Sample	<i>C</i>	<i>N</i>	<i>N</i>	<i>N</i> , Pure	<i>N</i> , Pure
N	76	201	201	159	159

Table VI
Determinants of Deal Failure

OLS regressions with a dummy variable for deal failure as the dependent variable. Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. KZ index is the four-variable version in Lamont et al. (2001). Experienced acquirers (dummy variable) appear at least five times in the data set. Target CAR is measured on the [-25, 1] window around deal announcement. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Full set of interactions with Cash indicates that interactions of all independent are included. (All coefficients are insignificant and not shown.) Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	Deal failure			
Cash $\in [0, 1]$	-0.015 (0.01)	-0.014 (0.03)	-0.033 (0.03)	-0.138 (0.12)
Log(target size)		-0.015*** (0.00)	-0.016*** (0.01)	-0.013* (0.01)
Log(relative deal size)		0.027*** (0.00)	0.024*** (0.00)	0.030*** (0.01)
Offer premium		-0.041* (0.02)	0.020 (0.03)	0.021 (0.04)
Hostile		0.341*** (0.06)	0.286*** (0.06)	0.309*** (0.11)
LBO		0.232 (0.22)	0.063 (0.23)	0.061 (0.24)
q of acquirer		0.007* (0.00)	0.007* (0.00)	0.003 (0.00)
q of target		0.001 (0.01)	0.003 (0.01)	0.005 (0.01)
KZ of acquirer			0.003 (0.01)	0.006 (0.01)
KZ of target			-0.000 (0.00)	-0.005 (0.01)
Experienced acquirer			-0.023 (0.02)	-0.022 (0.03)
Target CAR (B-25, B+1)			-0.141*** (0.04)	-0.125** (0.05)
% of target sought			-0.001 (0.00)	-0.001 (0.00)
Cash \times Premium		0.056 (0.04)	0.101** (0.04)	0.100 (0.07)
Cash \times q of target		-0.001 (0.01)	-0.003 (0.01)	-0.008 (0.01)
Full set of interactions with Cash	N	N	N	Y
Industry & year FE	N	Y	Y	Y
N	2,206	2,200	1,967	1,967

Table VII
Robustness Checks

OLS regressions with target CAR from 25 days before announcement to 25 days after deal failure as the dependent variable. The sample is restricted to unsuccessful bids. KZ index is the four-variable version in Lamont et al. (2001). Same industry is an indicator for whether target and bidder have matching two-digit SIC codes. Toehold is equal to one if the acquirer owned a share of the target before announcement. Experienced acquirers (dummy variable) appear at least five times in the data set. Cash of acquirer is the acquirer's cash position in 2010 \$m on the balance sheet (as used in the construction of the KZ index). All other variables are as in our baseline specification in Table III. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and the acquirer's cash balance as well as all q and KZ variables are winsorized at the 1st and 99th percentiles. Coefficient estimates for Offer premium, Hostile, LBO, and q of acquirer and target are not shown; as in Table III, only Offer premium (and Hostile) is significant. Industry fixed effects are based on one-digit SIC codes. Robust standard errors are in parentheses.

	Target CAR (B-25, F+25)					
Cash $\in [0, 1]$	0.314*	0.405**	0.497***	0.371**	0.471***	0.453***
	(0.16)	(0.16)	(0.17)	(0.18)	(0.17)	(0.16)
Log(target size)	-0.030	-0.030	-0.037*	-0.016	-0.041*	-0.017
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Log(relative deal size)	0.021	0.012	0.015	-0.000	0.020	0.003
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
KZ of acquirer	-0.019					
	(0.04)					
KZ of target	0.026					
	(0.03)					
Same industry (2 digits SIC)		-0.049				
		(0.08)				
Toehold			0.228**			
			(0.09)			
Experienced acquirer				-0.235**		
				(0.10)		
Cash of acquirer					0.036**	
					(0.02)	
Cash \times Premium	-0.112	-0.212	-0.221	-0.246	-0.226	0.136
	(0.23)	(0.23)	(0.23)	(0.24)	(0.24)	(0.24)
Cash \times q of target	-0.057	-0.092**	-0.100**	-0.104**	-0.088**	-0.093**
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)
Cash \times KZ of acquirer	0.012					
	(0.05)					
Cash \times Same industry		0.096				
		(0.12)				
Cash \times Toehold			-0.104			
			(0.13)			
Cash \times Experienced acquirer				0.188		
				(0.14)		
Cash \times Cash of acquirer					-0.029	
					(0.02)	
Cash \times 1980s/1990s \times Premium						-0.507**
						(0.25)
Controls for Premium, Hostile, LBO, q of acquirer, q of target	Y	Y	Y	Y	Y	Y
Industry & year FE	Y	Y	Y	Y	Y	Y
N	217	249	249	249	249	249

Table VIII
Future Takeover Attempts

OLS regressions with a dummy variable indicating another merger bid within the next two years as the dependent variable. The sample is restricted to unsuccessful bids. We exclude observations with merger bids within half a year after failure since their classification as competing bid (in the previous takeover attempt) versus new bid is ambiguous. Target size is the target's market value of equity in 2010 \$bn. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include an indicator variable for whether the bid was hostile. KZ index is the four-variable version in Lamont et al. (2001). Target CAR (B-25, F+25) is the cumulative abnormal return from 25 days before announcement until 25 days after deal failure. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	New deal announced 2 years after failure				
Cash $\in [0, 1]$	0.068 (0.06)	0.042 (0.07)	0.060 (0.08)	0.053 (0.09)	0.061 (0.09)
Log(target size)			0.026 (0.02)	0.023 (0.02)	0.022 (0.02)
Offer premium			-0.036 (0.07)	-0.040 (0.07)	-0.024 (0.08)
Hostile			-0.099 (0.13)	-0.092 (0.14)	-0.084 (0.14)
q of target			-0.038** (0.01)	-0.034** (0.02)	-0.034** (0.02)
KZ of target				0.010 (0.02)	0.010 (0.02)
Target CAR (B-25, F+25)					-0.056 (0.06)
Industry & year FE	N	Y	Y	Y	Y
N	220	220	220	206	206

Supplementary Appendix
to
Cash is King –
Revaluation of Targets after Merger Bids
by Ulrike Malmendier, Marcus M. Opp, and Farzad Saidi

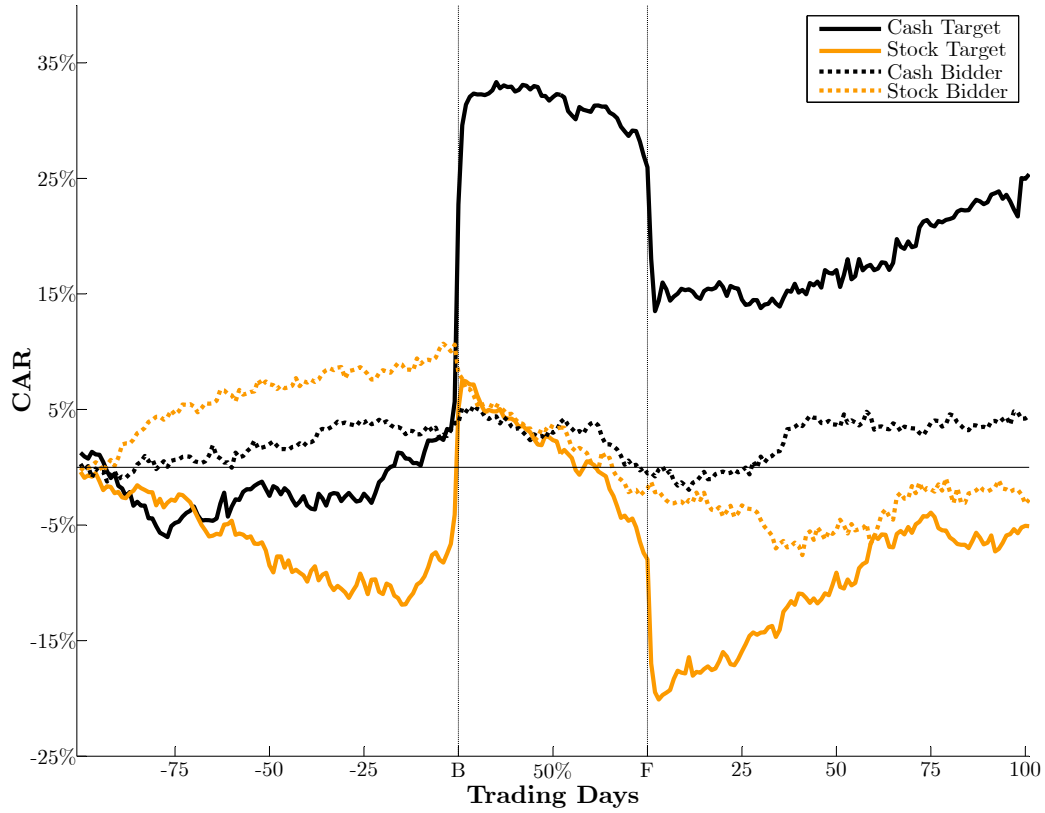


Figure A.1. Announcement Effects at Bid and at Failure (+/- 100 days). Cumulative Abnormal Returns (CARs) from 100 trading days pre-announcement of the initial bid (B) to 100 trading days after failure (F). The sample consists of 73 cash and 96 stock deals, which have stock market data available for 100 days pre-announcement and post-failure.

Table A.I
Summary Statistics – Successful Bids

Time to completion is in trading days. Transaction values in 2010 \$bn are based on historical transaction values, converted using Consumer Price Index (CPI) Conversion Factors. Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. Hostile deal, LBO, and Tender offer are dummy variables indicating hostile bids, leveraged buy-outs, and tender offers, respectively. q ratio is the market value of equity plus assets minus the book value of equity all over assets. KZ index is the four-variable version as, e.g., in Lamont et al. (2001). New deal announced within 2 years (dummy variable) is conditional on the deal being announced at least half a year after the previous one. Experienced acquirers (dummy variable) appear at least five times in the data set. Same industry is an indicator variable for whether target and bidder operate in the same industry, as defined by the respective SIC codes. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. The sample is restricted to bids for which all control variables are available except for KZ of acquirer (678 pure-cash and 618 pure-stock deals) and KZ of target (666 pure-cash and 625 pure-stock deals).

Variable	Cash Bids				Stock Bids				p-value
	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max	
Time to completion	58.90	37.84	5	230	84.80	39.35	16	239	0.000
Transaction value in 2010 \$bn	0.68	1.46	0.00	17.40	1.59	5.67	0.00	70.51	0.000
Target size in 2010 \$bn	0.52	1.09	0.00	11.40	1.10	4.14	0.00	65.16	0.000
Relative deal size	0.69	5.83	0.00	137.03	0.58	3.17	0.00	79.38	0.662
Offer premium in %	46.39	35.11	0	200	47.49	43.02	0	200	0.604
Hostile deal in %	2.56	15.80	0	100	0.75	8.67	0	100	0.010
LBO in %	0.28	5.32	0	100	0	0	0	0	0.171
Tender offer in %	49.29	50.03	0	100	4.08	19.81	0	100	0.000
q of acquirer	2.08	1.71	0.51	15.20	3.28	3.22	0.51	15.20	0.000
q of target	1.84	1.39	0.50	9.91	2.58	2.27	0.50	9.91	0.000
q of acquirer > q of target in %	59.80	40.06	0	100	63.69	48.13	0	100	0.140
KZ of acquirer	-0.15	1.30	-6.03	3.73	-0.36	1.66	-10.46	3.01	0.011
KZ index target	-0.04	1.58	-10.05	5.22	-0.24	1.86	-9.57	4.70	0.036
Experienced acquirer in %	83.24	37.38	0	100	78.67	41.00	0	100	0.031
% of target sought	91.78	22.36	1.80	100	95.70	16.04	7.70	100	0.000
New deal announced within 2 years in %	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Same industry (1 digit SIC) in %	69.74	45.97	0	100	76.70	42.30	0	100	0.004
Same industry (2 digits SIC) in %	53.84	49.89	0	100	64.75	47.81	0	100	0.000
N				704				661	

Table A.II
Determinants of Cash Offers

OLS regressions include acquirer and target industry controls. Cash is expressed as a fraction of the total payment (and hence equal to a dummy for cash in the sample of pure cash and stock deals (Pure) in the last three columns). Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. KZ index is the four-variable version in Lamont et al. (2001). Experienced acquirers (dummy variable) appear at least five times in the data set. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. Robust standard errors are in parentheses.

	Cash $\in [0, 1]$			Cash $\in \{0, 1\}$		
Log(target size)		0.003 (0.01)	0.002 (0.01)		0.004 (0.01)	0.001 (0.01)
Log(relative deal size)	-0.053*** (0.01)	-0.061*** (0.01)	-0.063*** (0.01)	-0.066*** (0.01)	-0.071*** (0.01)	-0.074*** (0.01)
Offer premium			0.060** (0.03)			0.041 (0.03)
Hostile			0.232*** (0.05)			0.288*** (0.06)
LBO			0.410*** (0.09)			0.376*** (0.11)
q of acquirer		-0.028*** (0.00)	-0.030*** (0.00)		-0.029*** (0.00)	-0.028*** (0.01)
q of target		-0.032*** (0.01)	-0.034*** (0.01)		-0.037*** (0.01)	-0.038*** (0.01)
KZ of acquirer			-0.001 (0.01)			0.002 (0.01)
KZ of target			-0.014** (0.01)			-0.011 (0.01)
Exp. acquirer	-0.006 (0.02)	-0.011 (0.02)	-0.017 (0.03)	-0.010 (0.03)	-0.008 (0.03)	-0.021 (0.03)
% of target sought	-0.002*** (0.00)	-0.001** (0.00)	-0.002** (0.00)	-0.002*** (0.00)	-0.001* (0.00)	-0.001** (0.00)
Industry & year FE	Y	Y	Y	Y	Y	Y
Sample	All	All	All	Pure	Pure	Pure
N	2,200	2,200	1,967	1,563	1,563	1,417

Table A.III
Determinants of Deal Failure: Pure Cash and Pure Stock Bids

OLS regressions with a dummy variable for deal failure as the dependent variable. The sample is restricted to unsuccessful pure cash and stock bids. Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. KZ index is the four-variable version in Lamont et al. (2001). Experienced acquirers (dummy variable) appear at least five times in the data set. Target CAR is measured on the [-25, 1] window around deal announcement. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Full set of interactions with Cash indicates that interactions of all independent are included. (All coefficients are insignificant and not shown.) Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	Deal failure			
Cash $\in \{0, 1\}$	-0.033*	-0.049	-0.058*	-0.211
	(0.02)	(0.03)	(0.03)	(0.14)
Log(target size)		-0.015**	-0.017**	-0.014
		(0.01)	(0.01)	(0.01)
Log(relative deal size)		0.033***	0.032***	0.043***
		(0.00)	(0.01)	(0.01)
Offer premium		-0.037	0.010	0.015
		(0.03)	(0.04)	(0.05)
Hostile		0.358***	0.291***	0.312**
		(0.07)	(0.07)	(0.14)
LBO		0.236	0.072	0.072
		(0.22)	(0.22)	(0.23)
q of acquirer		0.005	0.005	0.003
		(0.00)	(0.00)	(0.01)
q of target		-0.003	0.002	0.005
		(0.01)	(0.01)	(0.01)
KZ of acquirer			0.009	0.011
			(0.01)	(0.01)
KZ of target			0.003	0.002
			(0.00)	(0.01)
Experienced acquirer			-0.013	-0.011
			(0.03)	(0.04)
Target CAR (B-25, B+1)			-0.105**	-0.091
			(0.05)	(0.06)
% of target sought			-0.000	-0.002
			(0.00)	(0.00)
Cash \times Premium		0.073	0.109**	0.100
		(0.04)	(0.05)	(0.07)
Cash $\times q$ of target		0.004	0.001	-0.006
		(0.01)	(0.01)	(0.01)
Full set of interactions with Cash	N	N	N	Y
Industry & year FE	N	Y	Y	Y
N	1,566	1,563	1,417	1,417

Table A.IV
Pure Cash and Pure Stock Deals, Robustness Checks

OLS regressions with target CAR from 25 days before announcement to 25 days after deal failure as the dependent variable. The sample is restricted to unsuccessful pure cash and stock bids. KZ index is the four-variable version in Lamont et al. (2001). Same industry is an indicator for whether target and bidder have matching two-digit SIC codes. Toehold is equal to one if the acquirer owned a share of the target before announcement. Experienced acquirers (dummy variable) appear at least five times in the data set. Cash of acquirer is the acquirer's cash position in 2010 \$m on the balance sheet (as used in the construction of the KZ index). All other variables are as in our baseline specification in Table III. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and the acquirer's cash balance as well as all q and KZ variables are winsorized at the 1st and 99th percentiles. Coefficient estimates for Offer premium, Hostile, LBO, and q of acquirer and target are not shown; as in Table III, only Offer premium is significant. Industry fixed effects are based on one-digit SIC codes. Robust standard errors are in parentheses.

	Target CAR (B-25, F+25)					
Cash $\in \{0, 1\}$	0.345*	0.438**	0.561***	0.442**	0.556***	0.552***
	(0.20)	(0.20)	(0.21)	(0.19)	(0.20)	(0.19)
Log(target size)	-0.033	-0.038*	-0.046*	-0.017	-0.043*	-0.018
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Log(relative deal size)	0.021	0.008	0.008	-0.013	0.015	-0.007
	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)
KZ of acquirer	-0.034					
	(0.04)					
KZ of target	0.044					
	(0.04)					
Same industry (2 digits SIC)		-0.110				
		(0.10)				
Toehold			0.278***			
			(0.10)			
Experienced acquirer				-0.306**		
				(0.12)		
Cash of acquirer					0.024	
					(0.03)	
Cash \times Premium	-0.097	-0.210	-0.189	-0.247	-0.233	0.176
	(0.25)	(0.25)	(0.26)	(0.25)	(0.26)	(0.27)
Cash \times q of target	-0.057	-0.114**	-0.126***	-0.141***	-0.114**	-0.124***
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cash \times KZ of acquirer	0.057					
	(0.06)					
Cash \times Same industry		0.163				
		(0.14)				
Cash \times Toehold			-0.136			
			(0.14)			
Cash \times Experienced acquirer				0.229		
				(0.16)		
Cash \times Cash of acquirer					-0.020	
					(0.03)	
Cash \times 1980s/1990s \times Premium						-0.649**
						(0.27)
Controls for Premium, Hostile, LBO, q of acquirer, q of target	Y	Y	Y	Y	Y	Y
Industry & year FE	Y	Y	Y	Y	Y	Y
N	171	194	194	194	194	194

Table A.V
Future Takeover Attempts: Pure Cash and Pure Stock Bids

OLS regressions with a dummy variable indicating another merger bid within the next two years as the dependent variable. The sample is restricted to unsuccessful pure cash and stock bids. We exclude observations with merger bids within half a year after failure since their classification as competing bid (in the previous takeover attempt) versus new bid is ambiguous. Target size is the target's market value of equity in 2010 \$bn. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include an indicator variable for whether the bid was hostile. KZ index is the four-variable version in Lamont et al. (2001). Target CAR (B-25, F+25) is the cumulative abnormal return from 25 days before announcement until 25 days after deal failure. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	New deal announced 2 years after failure				
Cash $\in \{0, 1\}$	0.065 (0.07)	0.031 (0.07)	0.030 (0.09)	0.022 (0.09)	0.033 (0.09)
Log(target size)			0.017 (0.02)	0.013 (0.02)	0.010 (0.02)
Offer premium			-0.020 (0.08)	-0.015 (0.09)	0.003 (0.10)
Hostile			-0.023 (0.15)	0.016 (0.17)	0.019 (0.17)
q of target			-0.032 (0.02)	-0.029 (0.02)	-0.027 (0.02)
KZ of target				-0.003 (0.03)	-0.003 (0.03)
Target CAR (B-25, F+25)					-0.067 (0.07)
Industry & year FE	N	Y	Y	Y	Y
N	171	171	171	161	161

Table A.VI
Future Takeover Premia

OLS regressions with future offer premia in case of another merger bid within the next two years (and zero otherwise) as the dependent variable. The sample is restricted to unsuccessful bids. We exclude observations with merger bids within half a year after failure since their classification as competing bid (in the previous takeover attempt) versus new bid is ambiguous. Target size is the target's market value of equity in 2010 \$bn. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include an indicator variable for whether the bid was hostile. KZ index is the four-variable version in Lamont et al. (2001). Target CAR (B-25, F+25) is the cumulative abnormal return from 25 days before announcement until 25 days after deal failure. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	New offer premium within two years after failure				
Cash $\in [0, 1]$	0.026 (0.03)	0.023 (0.04)	0.006 (0.05)	0.006 (0.06)	0.006 (0.06)
Log(target size)			0.003 (0.01)	0.002 (0.01)	0.001 (0.01)
Offer premium			0.039 (0.06)	0.052 (0.07)	0.052 (0.07)
Hostile			-0.002 (0.05)	-0.023 (0.05)	-0.023 (0.05)
q of target			-0.015** (0.01)	-0.015** (0.01)	-0.015** (0.01)
KZ of target				-0.008 (0.01)	-0.008 (0.01)
Target CAR (B-25, F+25)					-0.003 (0.03)
Industry & year FE	N	Y	Y	Y	Y
N	213	213	213	199	199

Table A.VII
Future Takeover Premia: Pure Cash and Pure Stock Deals

Notes: OLS regressions with future offer premia in case of another merger bid within the next two years (and zero otherwise) as the dependent variable. The sample is restricted to unsuccessful pure cash and stock bids. We exclude observations with merger bids within half a year after failure since their classification as competing bid (in the previous takeover attempt) versus new bid is ambiguous. Target size is the target's market value of equity in 2010 \$bn. Offer premium is normalized by the target's market capitalization one month prior to the announcement of the bid, and truncated between 0 and 2. We include an indicator variable for whether the bid was hostile. KZ index is the four-variable version in Lamont et al. (2001). Target CAR (B-25, F+25) is the cumulative abnormal return from 25 days before announcement until 25 days after deal failure. All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	New offer premium within two years after failure				
Cash $\in \{0, 1\}$	0.033 (0.04)	0.035 (0.04)	0.010 (0.05)	0.012 (0.06)	0.009 (0.07)
Log(target size)			0.004 (0.01)	0.000 (0.01)	0.001 (0.01)
Offer premium			0.069 (0.08)	0.089 (0.09)	0.084 (0.09)
Hostile			0.023 (0.06)	0.003 (0.07)	0.002 (0.07)
q of target			-0.015* (0.01)	-0.017* (0.01)	-0.018 (0.01)
KZ of target				-0.019 (0.01)	-0.019 (0.01)
Target CAR (B-25, F+25)					0.017 (0.04)
Industry & year FE	N	Y	Y	Y	Y
N	166	166	166	156	156

Table A.VIII
Determinants of Target Debt Changes

OLS regressions with the one-year change (from the end of the year before deal announcement to the end of the year of deal failure) in the log of the sum of the target's long-term and short-term debt as the dependent variable, which is winsorized at the 1st and 99th percentiles. All samples are restricted to unsuccessful bids. The samples are as follows: (I) regression sample; (II) no restrictions on sample; (III) regression sample, pure cash and stock deals; (IV) no restrictions on sample other than pure cash and stock deals, i.e., including private acquirers. Cash is expressed as a fraction of the total payment (and hence equal to a dummy for cash in the sample of pure cash and stock deals in the last two columns). Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. KZ index is the four-variable version in Lamont et al. (2001). All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. Robust standard errors are in parentheses.

	$\Delta \ln \text{Debt}$			
Cash	-0.002 (0.16)	-0.102 (0.09)	-0.107 (0.16)	-0.080 (0.11)
Offer premium	0.034 (0.13)	0.101 (0.07)	0.161 (0.15)	0.140 (0.09)
Hostile	0.199 (0.18)	0.185* (0.10)	0.126 (0.21)	0.066 (0.10)
LBO	3.899*** (0.49)	0.107 (0.09)	3.908*** (0.52)	0.141 (0.11)
q of target	0.017 (0.05)	0.034 (0.03)	-0.090 (0.06)	0.006 (0.03)
KZ of target	-0.013 (0.05)	-0.046** (0.02)	-0.079 (0.05)	-0.057** (0.02)
Industry & year FE	Y	Y	Y	Y
Sample	(I)	(II)	(III)	(IV)
N	203	687	160	525

Table A.IX
Acquirer Returns

OLS regressions with acquirer CAR from 25 days before announcement to 25 days after deal failure as the dependent variable. The sample *All* consists of all unsuccessful bids, and the sample *C* consists of all deals that were canceled due to (potential) regulatory intervention (i.e., even if only indicated in the SDC deal synopsis), target news, or disagreement on management terms. Target size is the target's market value of equity in 2010 \$bn. Relative deal size is the transaction value over the acquirer's market value of equity. Offer premium is normalized by the target's market capitalization at one month prior to the announcement of the bid, and truncated between 0 and 2. We include indicator variables for whether the bid was hostile or a leveraged buyout. KZ index is the four-variable version in Lamont et al. (2001). All non-deal-related variables (e.g., q ratios) are measured at the end of the year prior to the unsuccessful deal's announcement, and all q and KZ variables are winsorized at the 1st and 99th percentiles. Industry fixed effects are based on one-digit SIC codes. A constant term is always included in the absence of fixed effects. Robust standard errors are in parentheses.

	Acquirer CAR (B-25, F+25)			
Cash $\in [0, 1]$	0.132**	0.138**	0.056	0.156*
	(0.06)	(0.07)	(0.14)	(0.09)
Log(target size)			-0.002	
			(0.02)	
Log(relative deal size)			0.016	
			(0.02)	
Offer premium			-0.148	
			(0.12)	
Hostile			-0.004	
			(0.08)	
LBO			0.077	
			(0.18)	
q of acquirer			0.006	
			(0.04)	
q of target			-0.020	
			(0.03)	
KZ of acquirer			0.028	
			(0.05)	
KZ of target			0.018	
			(0.03)	
Cash \times Premium			0.189	
			(0.15)	
Cash \times q of acquirer			-0.054	
			(0.06)	
Cash \times KZ of acquirer			0.007	
			(0.06)	
Industry & year FE	N	Y	Y	N
Sample	All	All	All	<i>C</i>
N	249	249	217	82