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ARTICLE

Financial versus strategic bidders and underpricing as an acquisition motive

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Abstract

We examine the difference between financial and strategic bidders in exploiting target underpricing. To isolate underpricing from other sources of acquisition gain, we estimate the target revaluation of bids that fail to be completed. We document larger revaluations for targets of financial bidders, precisely private equity bidders than for those of strategic bidders when targets are most likely to be underpriced, that is, when they are small. This differential effect between financial and strategic bidders in target revaluation is robust after controlling for differential sorting into deal failure, future takeover activity and anticipated operational changes and therefore indicates that it is greater target underpricing before bid announcements that financial bidders reveal to the market than strategic bidders do. This suggests that financial bidders and private equity firms attempting to buy smaller firms are more likely associated with underpriced targets than strategic bidders.

KEYWORDS

acquisition motives, financial acquirers, mispricing, revaluation, undervaluation

JEL CLASSIFICATION

G14, G32, G34

> "Whether we're talking about socks or stocks, I like buying quality merchandise when it is marked down."
>
> (Warren Buffett)

1 INTRODUCTION

In their acquisitions, financial bidders and strategic bidders are likely to focus on different sources of gains. Strategic bidders mainly seek to gain from synergies with target firms. In the absence of synergistic gains, financial bidders search to unlock significant value by drawing mainly from two other sources. One is the operational improvements that financial acquirers can implement after the acquisition. Existing studies show that they are especially good at acquiring poorly managed firms and improving their operations and governance (Gorbenko & Malenko, 2014; Hege et al., 2018). The other is the benefit they obtain from the heavy use of debt financing in favorable terms (Axelson et al., 2013; Guo et al., 2011; Martos-Vila et al., 2019). Alternatively, profit opportunities can arise when financial bidders target underpriced firms whose prospects are not well understood by the market.[1] By underpricing, we refer to the value gap that exists when market values fall below fundamental values.[2]

The goal of this paper is to evaluate whether financial bidders are more prone to exploit underpricing as a source of value than strategic bidders. Previous studies show that underpricing drives acquisition activity and constitutes a source of gain.[3] However, little is known whether this motive stands out, in particular, for financial bidders. While both financial and strategic bidders can gain from bidding on underpriced targets, there are reasons to believe that financial bidders will be more disposed to exploit this source of gain.

That is, we conjecture that bidder identity may matter when it comes to exploiting underpricing in the context of acquisitions. In the absence of synergistic gains, financial bidders may have incentives to specialize in, or may be more skilled at, exploiting pricing error. In contrast, strategic bidders, focusing on synergies may underweight underpricing as a source of gain or simply be less skilled at detecting pricing error. The idea that different bidder types emphasize different sources of gains is developed from Gorbenko and Malenko (2014) whose results are consistent with the segmentation view of the takeover market where different targets appeal to different bidders. In a related study, Dittmar et al. (2012) suggest that financial bidders, in particular private equity, have "superior skills in identifying good takeover targets and negotiating favorable deal terms." This view is also reflected in findings of international studies and is prevalent in professional circles.[4] Under the view that each type of bidder either specializes in different sources of gains or has differential skills, financial bidders are more likely to exploit underpricing. Furthermore, Rhodes-Kropf et al. (2005) show that targets with market prices below intrinsic value are concentrated in small deals.[5] If financial

[1] Gaughan (2014; Chap. 8 "Private equity market") explains that "Private equity funds seek out investments that are undervalued." Damodaran (2001, Chap. 25 "Motives for acquisitions") refers to undervaluation as a motive driving acquisitions by financial acquirers.

[2] The literature often uses "undervaluation" to refer to valuation gaps. Since the term undervaluation can also refer to price discounts due to poor management (Edmans et al., 2012), we use the term "underpricing" to distinguish clearly between the two concepts.

[3] Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004) present theoretical models consistent with stock market undervaluation being a source of acquisition gains. Rhodes-Kropf et al. (2005), Dong et al. (2006), Renneboog et al. (2007), Edmans et al. (2012), Barraclough et al. (2013) and Borochin (2014) provide empirical support for this prediction, but they did not explore differences of bidder types in exploiting this gain.

[4] Studies on cross-border acquisitions show that strategic bidders backed up by financial investors, that is, partly owned by institutional investors, experience higher acquisition gains than strategic bidders without such financial investor ownership, suggesting that financial investors have an informational advantage over strategic investors about target firms (Faelten et al., 2014; Ferreira et al., 2010; Humphery-Jenner et al., 2017). Regarding views on financial bidders in professional circles, see for example, *The Strategic Secret of Private Equity*, Harvard Business Review, September 2007.

[5] Their paper mainly focuses on relative mispricing between targets and acquirors and not on fundamental underpricing—falling below intrinsic value—as an acquisition motive. They also exclude financial bidders because most of them do not have stock market information.

bidders are more driven by underpricing in their acquisition decisions than strategic bidders, we would expect this financial-versus-strategic differential effect to be especially pronounced in acquisitions of small targets.

To test these hypotheses, it is important to isolate target mispricing from other sources of gains.[6] Previous studies use different approaches to measure mispricing. One approach uses past stock price performance (Renneboog et al., 2007), or valuation ratios, such as the price-to-residual value, or the price-to-book and its decomposition (Dong et al., 2006; Rhodes-Kropf et al., 2005). However, Edmans et al. (2012) argue that the aforementioned valuation methods may capture both target mispricing and target mismanagement. As such, they use price pressure created by mutual fund outflows as a non-fundamental shock to stock prices to infer target pricing error. From a different perspective, Barraclough et al. (2013) use option prices to separate synergies and pricing effects around mergers and acquisitions. For our analysis, neither mutual fund holding nor option price is adequate for two reasons. One is that both are available mostly for larger firms and may impose data restrictions on our analysis. The other is that those two approaches still fall short of filtering away bidder-side agency motives, such as hubris.[7] We thus follow Safieddine and Titman (1999), Savor and Lu (2009) and Malmendier et al.(2016) and study target revaluations triggered by acquisition bids that fail to be completed. By construction, a potential revaluation of the target should be unrelated to a value creation or agency motive because any value to be added/reduced by the envisioned takeover becomes invalid once the acquisition attempt fails. Therefore, any potential revaluation can be read as a reassessment of target stand-alone value due to informational effects of bid announcement and be interpreted as *ex-ante* mispricing.[8] Specifically, we estimate target revaluations as target cumulative abnormal returns (CARS), from the announcement of the bid to the announcement of bid failure. For both financial and strategic bidders, we then evaluate whether the target price upon failure fully reverts to the pre-announcement price level or whether a revaluation effect remains. If underpricing as a source of gain is more relevant to financial bidders, we would expect a larger revaluation effect for financial-led failed bids than for those led by strategic bidders. We also analyze whether target revaluations are particularly concentrated around small targets.

Our dataset includes a panel of 795 acquisition bids that failed over the period 1981–2015, of which 226 bids were initiated by financial acquirers and 569 by strategic acquirers. First, we conduct an event study on target firm stock returns from the announcement of the bid to the announcement of the failure and evaluate whether there is any revaluation effect. We find that the target price upon failure does not fully revert to the pre-announcement price level and a positive revaluation of about 6.8% on average remains. This revaluation is associated with the identity of the bidder (18.6% for financial-led bids vs. 7.8% for strategic-led bids) and it is significantly larger for failed bids initiated by financial bidders when target firms are small (49.5%). Malmendier et al. (2016) show that target revaluations are related to the method of payment: cash deals trigger target revaluation, whereas stock deals do not. Since financial bidders tend to pay with cash and strategic bidders use cash and/or stock, our results could be driven by payment method effects rather than bidder type effects. To deal with this possibility, we look at target revaluations of cash-only bids. Target revaluations are higher for financial (18.4%) than for strategic bids (14.5%), but this difference is not significant. To reduce heterogeneity in the financial bidder group, we then focus on target revaluation around private equity bids. For target firms in the lowest size quartile, we find statistically significant larger target revaluations associated with private equity bids (65.4%) than strategic bids (25.5%). A controlled regression setting confirms that the revaluation is significantly larger for financial-led bids on small targets and that it can be attributed to private equity bidders. We interpret this finding as evidence that, when target firms are small, financial bidders, mainly private equity, exploit mispricing opportunities to a greater extent than strategic bidders.

Even though our approach neutralizes value gains that materialize with the acquisition, the revaluation effect could be the product of other forces at work and not just a reflection of prior-bid underpricing. Target revaluations could be

[6] Hubris can be considered a source of personal gain, although it destroys bidders' shareholder value.

[7] Both Hodgkinson and Partington (2008) and Nguyen et al. (2012) show multiple motives can co-exist, including hubris.

[8] There may not be any revaluation effect even if underpricing is motivating an acquisition. This is when the announcement of the acquisition fails to serve as a conduit to convey information to the market about the sources of gains.

the result of differential sorting into deal failure or could simply be the result of anticipation effects such as that of future offers. Alternatively, they could be the outcome of the anticipation of future operating improvements. If these alternative explanations affect financial-led and strategic-led bids differently, we would also observe differential revaluation effects, and our interpretation would be misleading.

To elaborate, first, target revaluation could be the result of differential sorting into deal failure. For example, if financial-led bids fail for reasons that lead to an increase in target price, while strategic-led bids fail for reasons unrelated to target price changes, we may be falsely associating bidder type to revaluation when it is the overproportion of financial-led bids that fail for reasons resulting in target price changes that drive the results. To address this concern, we follow two routes. First, we evaluate whether news-driven price movements during the bid-to-fail period explain our results. Second, we manually search news to identify directly the reason for failure. We show that our findings are unlikely to be driven by differential sorting into deal failure.

Second, the revaluation effect could be due to anticipation of future offers (Bradley et al., 1983). In our setup, this would imply that the revaluation effect around financial-led failed bids for small targets reflects that those targets are more likely to be acquired in the future, be acquired at a higher speed or a higher premium than other targets subject to failed bids. We perform a survival analysis on the likelihood and timing of subsequent offers and evaluate if financial-led-failed bids are more likely to be subject to future acquisitions. We further evaluate if the financial bidder type predicts a higher future offer price. This analysis finds no evidence supporting these possibilities. Finally, we analyze post-failure target long-term abnormal returns and find that the greater revaluation of small targets by financial (private equity) bidders is unlikely to revert in the post-failure period. Thus, this revaluation is unlikely to be driven by expectations that fail to realize.

Third, the revaluation effect could simply reflect the anticipation of future operational improvements by current management (Hirshleifer & Titman, 1990; Safieddine & Titman, 1999). To deal with this concern, we drop from the sample failed bids where targets are more likely to have a margin for operational improvements such as hostile bids and bids that failed due to a rejection by the board of directors of the target firm. The results remain unchanged. We then evaluate more directly whether the differential revaluation we detect reflects operational changes experienced by target firms after bid failure. To do that, we select a number of proxies for operational performance and compute three measures of operational change. We then examine if the operational change is particularly prominent in financial-led bids on small targets. We find no evidence that calls for an alternative interpretation of our findings.

With this analysis, we contribute to the literature on the difference between financial and strategic bidders; more precisely, add insight into how different sources of gains appeal differently to financial and to strategic bidders.[9] Our work is related to Gorbenko and Malenko (2014) who show that the two types of acquirers target different firms in auctions. While their findings suggest that financial bidders are attracted by targets' undervaluation due to mismanagement, we provide evidence on targets' undervaluation due to mispricing being an appealing motive to financial bidders when target firms are small. Also, we build directly on Dittmar et al. (2012) who use completed competing bids and show that bidder CARS are larger for strategic bidders competing with private equity than those competing with other strategic bidders. By excluding alternative explanations, they conclude that private equity has "superior skills in identifying good takeover targets and negotiating favorable deal terms." In this paper, we provide more direct evidence that private equity seems to exploit underpricing opportunities more than strategic bidders when underpricing is prevalent.

Further, we add to the literature that evaluates the rationale of the revaluation effect around unsuccessful acquisitions (Bradley et al., 1983; Malmendier et al., 2016; Safieddine & Titman, 1999; Savor & Lu, 2009). More precisely, this paper complements the findings in Malmendier et al. (2016) who show that revaluations, in a sample composed mostly of strategic bidders, are induced by the choice of cash as a medium of payment. They argue that bidders, by choosing to

[9] Papers that study differences between financial and strategic bidders often evaluate announcement returns and relate them to the identity of the acquirer (Bargeron et al., 2008; Dittmar et al., 2012; Hege et al., 2018). From a different perspective, Gorbenko and Malenko (2014) study competition and bids within each auction and Fidrmuc et al. (2012) compare the selling process of firms acquired by strategic acquirers to that of financial acquirers.

pay cash for the intended acquisition, convey information to the market about target firm mispricing. We extend their findings by showing that, in addition to the medium of payment, the identity of the bidder also reveals prior target firm mispricing. When bidding for small targets, such informational effect conveyed by the identity of financial bidders is above and beyond those conveyed by the medium of payment.

The rest of the paper is organized as follows. Section 2 explains how we construct our sample, introduces the variables that we use in the tests and provides descriptive statistics. Section 3 describes the empirical method that we implement to test our main hypothesis and presents the main empirical results. Section 4 discusses empirical challenges that could question our interpretation and provides additional analysis that confirms our main findings. Section 5 concludes.

2 | DATA

2.1 | Sample construction

Our sample of failed acquisition bids comes from the Security Data Company (SDC) Mergers and Acquisition database for the period from 1980 to 2015. We collect bids with deal status "withdrawn," "intention withdrawn" and "discontinued rumored." Thus, we discard bids with deal status "completed," "seek buyer," "seek buyer withdrawn" or "pending."[10] Furthermore, all bids are included regardless of the country of incorporation of the bidder and the target. We then retain bids that comply with the following restrictions. First, the target is a public firm for which we can obtain market prices and identify announcement and withdrawal dates.[11] Second, the deal involves a bid of more than 50% and up to 100% of the target. This is to ensure a real change of ownership if the deal was completed.[12] To filter noise created by target insiders, we exclude bids by the target management or employees. Last, we also exclude bids subject to a third party offer while the status of the original bid under analysis is still pending. This allows us to reduce the noise produced by any valuation effect related to a third party outbid.

To identify the bidder type, financial or strategic, we look at bidders' four-digit Standard Industrial Classification (SIC) code. Financial bidders have SIC codes between 6000 and 6999. Strategic bidders have SIC codes either below 6000 or over 6999. An exception is holding companies or financial units of strategic bidders, with SIC codes between 6000 and 6999, which we classify as strategic bidders. Then, we exclude targets with SIC codes between 6000 and 6999. This choice allows us to rule out bids by financial bidders that could be motivated by operational synergies, which helps focus on non-synergistic motives driving acquisition decisions.[13] At this stage, our sample includes 3569 failed deals: 1003 involving financial bidders and 2566 involving strategic bidders.

Next, for every target firm involved in a deal, we obtain stock prices and financial data from Datastream and Worldscope databases for non-US firms and from Center for Research in Security Prices and Compustat for US firms. To add price and financial data to our sample of failed deals, we use the Datastream code, the firm name and the country of primary listing as matching variables for non-US firms and use the six-digit Committee on Uniform Securities Identification Procedures number ("CUSIP") and the firm name for US firms. Then, we drop deals for which target stock price data are not available from 275 trading days before the bid announcement to 25 trading days after the bid failure.

[10] Bids flagged as "seek buyer" and "seek buyer withdraw" do not contain bidder names and thus restrain us from identifying bidder type. Excluding "pending" helps remove valuation effect of anticipated success.

[11] SDC considers firms with more than 50% free float to be public firms, so those listed before the deal announcement are included here and all other firms are excluded.

[12] Although the underpricing hypothesis may also apply to minority interest bids, takeover bids are used here for two reasons. First, a takeover bid catches much more market attention than a minority purchase and enables us to measure more clearly reactions in market prices from the announcement of the bid to its withdrawal. Second, the sample size of minority bid failures is too small to provide statistical significance once we require disclosure of the premium and public status of the targets.

[13] In unreported tests, we redo all estimations including bids where targets are from the financial service sector and acquirers are strategic. Our results do not change.

Next, we drop deals where target firm shares are illiquid, that is, not traded for more than 90% of trading days during the estimation window. Finally, we also discard deals where the offer price is lower than the target firm market price 4 weeks before the bid announcement. After these steps, the sample shrinks to 1992 failed deals including 648 (1344) financial (strategic) bidders. As a final step, for every failed deal, we further require non-missing data for key target and deal characteristics such as the method of payment (cash, stock, other), the premium, as well as hostility or a tender-offer indicator. This leaves us with 795 failed deals including 226 (569) financial (strategic) bidders. This constitutes our main sample for statistical analysis.

To reduce heterogeneity in the financial bidder group, we also identify private equity firms using various sources. Private equity literature suggests that private equity firms backed by human capital from financial and industry experts are more likely to have the skills to identify mispriced targets (Acharya et al., 2013; Gompers et al., 2016). To identify private equity firms, we use the financial sponsor flag in SDC and complement the results through the following identification procedures. First, we match financial bidder names in our sample with acquirer names in the MarketLine database that are flagged as private equity. Then, we match financial bidder names with institutional names in the FactSet Ownership database to complement private equity identification and to obtain indicators for other types of financial bidders. Last, for the unmatched bidder names, we decide their types based on business description and sector classification in Dun & Bradstreet Hoovers Business Browser database (D&B Hoovers), Bloomberg, bidders' official webpages, news articles and regulatory disclosure. Private equity includes investment companies that describe themselves using the keyword "private equity." If this keyword is absent, we also include investment companies whose business description is "investing in equity so to seek control over companies" a definition used by D&B Hoovers. From 226 financial bidders, we identify 173 as private equity, and the rest correspond to a diverse group including insurance companies, banks, real estate, non-deposit financing companies, business consultancy and so forth.

2.2 | Summary statistics

Table 1 reports and compares summary statistics of the key deal and target firm characteristics for both financial and strategic failed bids in our sample. Several important patterns emerge. As expected, the two bidder types differ in the medium of payment (*PctCash*, *PctStock*), and this difference is economically and statistically significant. Financial bidders tend to pay bids with cash, while strategic bidders often use stock or a combination of stock and cash. We must therefore make sure that we account for this in our tests. Next, the market capitalization (*TargetSize*) of financial bidders' targets is on average slightly larger than that of strategic bidders' targets with a difference of USD 57 million. As a consequence, deal value (*DealValue*), which is correlated to target market capitalization, is also higher for financial-led bids. This finding is consistent with Gorbenko and Malenko (2014) who show that financial bidders target more mature firms in auctions. Regarding premiums *(Premium)*, financial bidders offer on average about 4% lower premiums than strategic bidders.[14] This lower premium can be explained by the absence of operational synergies.[15] Another characteristic typical of financial bidders is that sometimes the bidder is a group of multiple investors. In our sample, financial bidders show a higher proportion of bidding as a group (*InvGroup*). In almost 30% of cases, financial bidders do not bid as single bidders. This is not surprising given that financial bidders target large firms while relying mostly on debt financing. Further, the bid-to-fail period (*Days*) or the number of days from the announcement of the bid to withdrawal is slightly higher for financial bidders: 101 for financial and 88 for strategic bidders. Similarly, the stake size sought (*StakeSought*), the degree of hostility (*Hostile*) and the likelihood that the target is liable to pay a termination fee to the bidder upon withdrawal (*TTerm*) are not economically different between the two types of bidders. Finally, it

[14] Focusing on US domestic completed bids where acquirers own 100% stake, Bargeron et al. (2008) find the premium from financial bidders is around 12% lower than strategic bidders.

[15] See Bargeron et al. (2008) for alternative explanations.

TABLE 1 Deal summary statistics

	Financial						Strategic						Difference	
	(1)						(2)						(1)–(2)	
	N	Mean	Median	Std.dev.	25th	75th	*N*	Mean	Median	Std.dev.	25th	75th	*t*-test	*W*-test
PctCash	226	93.11	100.00	20.92	100.00	100.00	569	52.50	60.65	47.15	0.00	100.00	16.81***	11.02***
PctStock	226	3.78	0.00	17.49	0.00	0.00	569	43.65	0.00	47.29	0.00	100.00	−17.35***	−11.40***
PctOther	226	3.11	0.00	11.26	0.00	0.00	569	3.85	0.00	14.59	0.00	0.00	−0.77	0.51
Days	226	101.48	81.00	82.71	45.00	140.00	569	88.03	71.00	69.82	36.00	120.00	2.16**	1.71*
DealValue	226	267.48	133.80	312.30	42.33	403.49	546	203.36	103.03	257.06	38.00	258.85	2.68***	2.26**
Premium	226	0.47	0.32	0.53	0.15	0.60	569	0.51	0.40	0.49	0.20	0.63	−1.1	−2.73***
Hostile	226	0.13	0.00	0.33	0.00	0.00	569	0.15	0.00	0.36	0.00	0.00	−0.74	−0.72
TenderOffer	226	0.48	0.00	0.50	0.00	1.00	569	0.37	0.00	0.48	0.00	1.00	2.76***	2.79***
StakeSought	226	89.36	100.00	17.10	85.15	100.00	567	95.22	100.00	13.04	100.00	100.00	−4.62***	−7.15***
Toehold	93	17.89	14.80	12.94	7.60	27.40	95	16.43	13.30	12.39	5.60	23.80	0.79	0.82
TTerm	226	0.11	0.00	0.31	0.00	0.00	569	0.14	0.00	0.35	0.00	0.00	−1.32	−1.26
InvGroup	226	0.25	0.00	0.43	0.00	1.00	569	0.01	0.00	0.07	0.00	0.00	8.48***	11.85***
TargetSize	226	243.25	118.98	306.03	32.57	328.30	569	185.80	78.74	261.10	26.03	225.49	2.49**	2.52**
MB	149	2.46	1.26	5.73	0.81	2.06	402	3.06	1.49	6.53	0.82	2.47	−1.04	−1.64

Note: This table reports key deal level and target firm characteristics for the sample as described in Section 2. *Financial (Strategic)* refers to bids initiated by a financial (strategic) bidder. *PctCash* (*PctStock/PctOther*) is the percentage of deal value to be paid in cash (in stock/other than cash or stock; i.e., total value minus value paid in cash and stock). *Days* is the number of trading days between the announcement and the effective/withdrawal date. *DealValue* (*TargetSize*) is the transaction value (target market capitalization 4 calendar weeks prior to bid announcement) in millions of dollars, adjusted for inflation using Consumer Price Index conversion factor to dollars of 2014. *Premium* is the bidder's offer price divided by the target's stock price 4 calendar weeks prior to bid announcement. It is truncated between zero and two. *StakeSought* is the percentage of common or common equivalent shares outstanding sought by the bidder in this transaction. *Toehold* is the percentage of common shares outstanding held by the bidder as of the announcement date. *Hostile*, *TenderOffer*, *TTerm* and *InvGroup* equal one for bids in which the bidder's attitude is hostile, tender offer is involved, the target is liable to pay a termination fee to the acquirer upon withdrawal or the acquirer is a group of multiple investors, respectively, and zero otherwise. *MB* is the market-to-book value of target's equity 4 calendar weeks prior to bid announcement. For each variable, to test whether target firms targeted by financial bidders are different from those targeted by strategic bidders, we compute skewness-adjusted *t*-statistic (*t*-test) and *z*-statistic of Wilcoxon–Mann–Whitney rank-sum test (*W*-test).

***, ** and * indicate 1%, 5% and 10% significance, respectively.

is worth pointing out that targets' average market-to-book value (*MB*) before bid announcement is not significantly different between financial and strategic bidders.

3 | EMPIRICAL ANALYSIS

In this section, by looking at failed bids, we aim to estimate whether prices revert to their initial level or there is any permanent revaluation effect; that is, any abnormal market reaction from bid announcement to the failure of the bid. The presence of any revaluation effect can be attributed to underpricing prior to the bid announcement where the bid per se conveys information to the market. This is because, bid announcement returns factor in information about acquisition gains, the probability of success and a reassessment of stand-alone values of both bidder and target, whereas target returns from bid announcement to failure result solely from the reassessment of the stand-alone value of the target firm. Thus, failed bids provide an ideal set-up to examine informational effects.

3.1 | Measuring market revaluation for target firms

To estimate market revaluation, we conduct an event study on target firm stock returns around bid announcements and bid withdrawals. The estimation window is from 275 to 25 trading days before bid announcements (−275, −25). Following standard event study methodology as in Brown and Warner (1985), we compute daily abnormal returns as prediction error from a market model using local market indices.[16] Stock and local market index returns are expressed in the home market currency. To account for illiquid stocks, we adjust abnormal returns following the "trade-to-trade" approach of Maynes and Rumsey (1993) and exclude bids where the stocks of target firms are not traded for more than 225 out of 250 trading days (90% of the estimation window).[17]

We then compute the CARs as (B − 25, F + 25) from 25 days before the announcement of the bid to 25 days after the announcement of the withdrawal following Malmendier et al. (2016). The choice of 25 days before the bid announcement allows us to capture price run-ups caused by rumors (Schwert, 1996). The choice of 25 days after bid failure allows us to incorporate the possibility that the stock markets react slowly to bad (withdrawal) news (Chan, 2003).

3.2 | CARs: Summary statistics and univariate tests by bidder type

Table 2, Panel A, provides CARs summary statistics and univariate tests. We present CARs for both *Financial* and *Strategic* bidders, as well as for the subgroup of financial bidders *Private Equity (PE)*. For each bidder type, we provide CARs for the whole sample and CARs by target size. *Size*Q1 to *Size*Q4 partitions the sample by quartiles according to target market capitalization. *Size*Q1 includes target firms with the lowest market capitalizations and allows us to evaluate our hypothesis that a potential revaluation effect should be larger for smaller firms. Asterisks next to means indicate statistical significance using skewness-adjusted *t*-tests. Asterisks next to medians indicate statistical significance using Wilcoxon sign-rank tests. For bids involving financial bidders, we observe a revaluation effect of around 18.6% and for strategic-led bids of 7.8%. For financial-led bids for small targets, the revaluation effect is 49.5%. Furthermore, all these values are statistically significant, and the difference in revaluations between financial and strategic-led bids is also statistically significant. Overall, our results are consistent with the idea that, upon bidding, financial bidders reveal

[16] In additional analysis, local market indices are replaced with Datastream value-weighted global market index in US dollars and local market currency exchange rates to US dollar. We also re-estimate CARs using a constant mean model. The findings are qualitatively similar.

[17] With this restriction we exclude 20 (55) failed bids by financial (strategic) bidders. Computing abnormal returns without adjusting for illiquid stocks do not change the results.

TABLE 2 Revaluation: Summary statistics and univariate tests

	Financial			PE			Strategic			*Financial* (*Strategic*)		*PE* (*Strategic*)	
	N	Mean	Median	*N*	Mean	Median	*N*	Mean	Median	*t*-test	*W*-test	*t*-test	*W*-test
Panel A. Target revaluation after bid failure (cumulative abnormal returns [CARs])													
All sample	226	0.186***	0.123***	173	0.209***	0.114***	569	0.078***	0.073***	2.45**	1.80*	2.63***	1.96*
SizeQ1	46	0.495***	0.409***	31	0.676***	0.549***	136	0.226**	0.141***	2.29**	1.87*	3.36***	2.74***
SizeQ2	48	0.137*	0.09	33	0.101	−0.021	150	0.048	−0.001	0.89	0.83	0.42	0.2
SizeQ3	54	0.082*	0.052	42	0.129**	0.089*	149	0.058*	0.1**	0.36	−0.21	0.97	0.48
SizeQ4	78	0.104**	0.042**	67	0.096**	0.027*	134	−0.0163	0.069	1.79*	1.14	1.57	0.88
Pay in cash = 100%	192	0.184***	0.123***	149	0.205***	0.115***	260	0.145***	0.127***	0.74	0.03	1.04	0.32
SizeQ1	38	0.447***	0.327***	26	0.654***	0.327***	48	0.255***	0.262**	1.28	0.93	2.42**	1.97**
SizeQ2	47	0.152**	0.1	33	0.101	−0.021	80	0.077*	0.068*	0.72	0.43	0.19	−0.23
SizeQ3	46	0.09*	0.038	37	0.149**	0.114**	81	0.158**	0.22**	0.82	−1.209	−0.1	−0.43
SizeQ4	61	0.111**	0.087**	53	0.088*	0.022	51	0.129***	0.126***	−0.22	−0.31	−0.46	−0.64
Panel B. Target firm-specific pricing error before bid announcement (mispricing)													
Pay in cash = 100%	670	−0.202***	−0.187***	385	−0.104***	−0.112***	2349	−0.028*	−0.047**	−5.46***	−5.39***	−1.91*	−2.01**
SizeQ1	220	−0.677***	−0.662***	107	−0.625***	−0.604***	697	−0.409***	−0.417*	−4.58***	−4.45***	−2.76***	−2.66**
SizeQ2	194	−0.125***	−0.162***	120	−0.051	−0.113	614	−0.061**	−0.128***	−1.26	−1.19	0.18	0.1
SizeQ3	169	0.169***	0.049**	118	0.249***	0.146***	601	0.188***	0.159***	−0.34	−0.68	0.96	0.71
SizeQ4	87	0.103*	0.068*	40	0.084	0.069	437	0.328***	0.214***	−3.14***	−2.89***	−2.38**	−2.15**

Note: Panel A reports *CARs* computed from 25 trading days before bid announcement to 25 trading days after the announcement of bid failure ($B - 25, F + 25$) grouped by bidder type. Daily abnormal returns are computed using a market model with parameters estimated over 250 trading days ending 25 trading days prior to the bid announcement. Panel B reports firm-specific pricing error (*ex-ante* mispricing) one quarter before the bid announcement for both failed and completed bids. This mispricing measure is based on Rhodes-Kropf et al. (2005). The column *Financial (Strategic)* contains only bids initiated by a financial (strategic) bidder. Column *PE* includes only bids initiated by private equity bidders. SizeQ1 (*SizeQ*4) contains bids where targets' market capitalization is ranked in the lower (upper) quartile. For each group and across groups, we also present univariate tests for the significance of CARs (mispricing). To test whether CARs (mispricing) are significantly different from zero and whether CARs (mispricing) are significantly different across subgroups, we compute skewness-adjusted *t*-statistic (*t*-test) and *z*-statistic of Wilcoxon–Mann–Whitney rank-sum test (*W*-test). Given the consistency of the results, we only report *t*-tests.

***, ** and * indicate 1%, 5% and 10% significance, respectively.

information about target mispricing, which suggests that they seize profit opportunities from valuation error. Another observation is that this activity appears to be more noticeable in acquisitions where target underpricing is more likely to be present. Thus, bidder identity seems to matter when it comes to exploiting mispricing.

Failed bids by financial bidders may show a higher revaluation effect only because they tend to involve cash as a medium of payment, while strategic bidders frequently use stock. Existing literature (Malmendier et al., 2016; Rhodes-Kropf & Viswanathan, 2004; Shleifer & Vishny, 2003) shows that it is important to separate stock- and cash-financed deals before making judgments on value effects, not only for bidding firms but also for target firms. Specifically, Malmendier et al. (2016) show that cash bids reveal prior underpricing of the target firm, but this is not the case for paid-in-stock bids. Thus, the inclusion in our sample of paid-in-stock bids may overstate the impact that financial bidders have on revaluation or overshadow the role of strategic bidders. To account for this possibility, we investigate whether our results merely reflect the method of cash payment that is frequently used by both bidder types.

For that, we create a subsample of cash-only bids (*Payment in Cash* = 100%) and, in Table 2, we provide the corresponding summary statistics of CARs by bidder type. We observe that while almost all financial bids involve a cash payment, more than half of strategic bids involve payment in stock or a mixture of cash and stock. Cash-only deals show a statistically significant revaluation effect of around 14.7% for the whole sample (unreported), which is consistent with the findings in Malmendier et al. (2016) that report a revaluation of 15%.[18] We also observe an average revaluation of 18.4% for financial-led bids, 14.5% for strategic-led bids and, interestingly, 44.7% for financial-led bids for small targets. However, there is no statistical difference between the financial and strategic groups. As expected, in unreported tests, we find that bids involving shares as a means of payment are not subject to significant revaluation for any type of bidder. These findings are consistent with Malmendier et al. (2016) who show that the medium of payment plays a key role and conveys information to the market about prior underpricing of the target.

Next, we evaluate whether the revaluation effect is concentrated in private equity bidders. Interestingly, we observe that the revaluation effect attached to small targets is especially prominent in private equity bids: 67.6% for the whole sample and 65.4% for the cash-only sub-sample, and these values are economically and statistically different from those of strategic-led bids. These results show that bidder type matters in bids involving small targets where there is room for profit opportunities from pricing error. Furthermore, our results extend Dittmar et al. (2012) who determine that private equity has "superior skills in identifying good takeover targets and negotiating favorable deal terms" by clarifying that, when target firms are small, a superior skill of private equity over other bidder types is to identify underpriced targets.

A natural question is whether we can generalize our findings to completed deals. To gain some insights, we estimate the *ex-ante* underpricing measure proposed by Rhodes-Kropf et al. (2005) for a sample of target firms that are subject to bid announcements regardless of their completion or failure status. This measure corresponds to the firm-level difference between the market price and the estimated intrinsic value. Since both components are in logarithm, this difference can be understood as the potential revaluation (CARs) from a correction in pricing error. Then, we average estimates by groups and perform univariate tests. For comparison, we report the results for cash-only bids in Panel B of Table 2.[19] Mirroring the results we obtained for the sample of failed bids, the potential for revaluation from a correction in pricing error is significantly larger for financial and private equity than for strategic bidders. In addition, consistent with Rhodes-Kropf et al. (2005), we find that the *ex-ante* underpricing is concentrated in targets with below-medium firm size.[20] More importantly, targets of financial bidders show a more severe underpricing than those of strategic bidders only in the subsample of the smallest firms (*SizeQ*1). The main limitation of the Rhodes-Kropf et al. (2005) measure, and of other *ex-ante* measures of underpricing in the literature (e.g., Dong et al., 2006; Renneboog

[18] As discussed in Fu et al. (2013), to focus on pure cash or pure stock bids captures more clearly acquisition motives, while interpretation on hybrid payments might be arbitrary.

[19] Results for the full sample of bids paid in cash, stock or both, as well as the subset of failure bids, are similar to those of cash-only bids and available upon request.

[20] We believe it is safe to transfer the association between target underpricing and deal size documented in Rhodes-Kropf et al. (2005) to that with target firm size because deal size and target firm size are highly correlated.

et al., 2007), is that they do not cleanly disentangle underpricing from other sources driving valuations, such as the inefficiency of current firm management (Edmans et al., 2012) or variation in growth options (Ritter & Warr, 2002). Nevertheless, *ex-ante* measures can hint at the presence of a differential effect between financial and strategic bidders in exploiting target underpricing that we corroborate in the sample of failed bids.

Taken together, the univariate tests support our hypothesis that a revaluation effect should be observed mostly for smaller firms targeted by financial bidders. Univariate tests confirm our prediction that financial bidders, notably private equity, seize profit opportunities when underpricing is most likely to occur. However, to gain further insight on the drivers of revaluation effects, we need to evaluate our hypothesis in a multivariate setting where we can explicitly control for other deal-level and firm-level characteristics that can be correlated with the revaluation effect.

3.3 | Multivariate analysis

To evaluate our hypothesis while accounting for deal-level and target firm-level characteristics, we evaluate CARs in a cross-sectional regression setting. The baseline model is:

$$CA\,R_i = \alpha + \beta Financial_i + \delta Financial_i \times SizeQ1_i + \gamma Controls + n_t + w_i + \varepsilon_i, \tag{1}$$

where i indicates the ith bid. CAR_i is the cumulative abnormal return for target firms from 25 days before the bid announcement to 25 days after bid withdrawal and refers to target revaluation. $Financial_i$ is the variable of interest that represents the type of bidder. It equals one (zero) if the ith bid is initiated by a financial (strategic) bidder. The coefficient β captures any differential target revaluation effect associated with bidder type "*Financial*." *Size*Q1 is a dummy variable that equals one if the target market capitalization is in the lowest quartile and zero otherwise. The coefficient δ on *Financial* × *Size*Q1 captures the incremental financial bidder revaluation attached to small targets. If financial bidders are more prone to exploit target underpricing than strategic bidders, one would expect to see higher revaluation effects for small firms, and therefore we would expect δ to be positive and significant. Next, we follow previous studies and control for deal-level and firm-level factors that can influence target revaluation. These factors include the medium of payment, target size, the offer price, an indicator for hostile attitude and an indicator for tender offer.[21,22] Finally, n_t and w_i are dummies for bid announcement year and one-digit SIC industries that control for macroeconomic conditions and regulation changes common to all buyers, target firms or certain industries.

The medium of payment captures how an acquirer pays for the acquisition. Shleifer and Vishny (2003) predict that deals with an underpriced target are more likely to be paid in cash. Empirically, Malmendier et al. (2016) show that target revaluation upon deal failure is mostly driven by deals involving cash payment. To measure the medium of payment, we construct *Cash* as a dummy variable that equals one if more than 50% of deal value is to be paid in cash.[23]

We measure target size, *Log(TargetSize)*, as the natural logarithm of target market capitalization adjusted for inflation using the Consumer Price Index conversion factor to dollars of 2014. Target market capitalization refers to the total number of outstanding target shares times the target stock price 4 weeks prior to the bid announcement. Target size is typically introduced as a control variable in target return regressions and found to be negatively associated with target abnormal return (e.g., Bargeron et al., 2008; Malmendier et al., 2016). Alexandridis et al. (2013) conclude that this negative relation indicates the uncertainty of synergy realization induced by the complexity of larger deals.

[21] Deal value is not included because it is highly correlated with target firm market capitalization, a key firm-level control variable in our regression. Previous studies (e.g., Malmendier et al., 2016) include deal value to gauge acquisition cost relative to bidders' business scale by scaling deal value by bidder's market capitalization. This is unfeasible here because most financial bidders are private.

[22] We do not add target valuation measures as a control, such as the market-to-book, because by focusing on failed bids, we would only expect such measures to be related to the revaluation effect if there is prior underpricing. Thus, such a control would be picking up the effect that we aim to capture with categorical variables. See for example Rhodes-Kropf et al. (2005), Dong et al. (2006), Edmans et al (2012) and Fu et al. (2013).

[23] Unreported robustness check uses the percentage of payment in cash. Our results remain qualitatively the same.

The offer price, once announced, immediately sets a reference for other investors of the total target value in the eyes of its bidder. Thus, it should also provide a benchmark for price correction on prior-bid mispricing. We use the offer price over the target stock price 4 weeks before the bid announcement to compute *Premium*, which we then use in our tests. Following previous studies, we retain only bids with the premium that are non-missing, positive and lower than 200%.[24] Malmendier et al. (2016) document that the premium is positively associated with CARs of failed bids. Likewise, we expect the premium to be positively correlated to the revaluation effect from bid announcement to bid failure. Furthermore, our central task is to show whether CARs of failed bids are linked to bidder type. As financial bidders tend to pay lower premiums than strategic bidders (Bargeron et al., 2008), adding a premium is necessary to control for bidder type differences.[25]

In a similar vein, we construct an indicator for hostile attitude. *Hostile* is a dummy that equals one when the acquisition attempt is hostile. A hostile takeover bid, even if unsuccessful, can trigger market anticipation that target management would improve future operational performance after resisting the bid (Hirshleifer & Titman, 1990). Finally, *TenderOffer* is a dummy that equals one when the bid is instrumented as a tender offer. A tender offer can build up the market expectation that the target may end up receiving a premium from a subsequent offer (Jensen & Ruback, 1983).

3.4 | Regression results

Table 3 presents baseline regression results for the whole sample and the cash-only subsample. Column 1 presents a positive and statistically significant coefficient on *Financial* × *SizeQ*1. This indicates that there is a larger revaluation of 29% attached to financial bidders bidding for small targets. Column 2 introduces the interaction *Strategic* × *SizeQ*1 to evaluate if the revaluation effect we uncover is also present for strategic bidders in the lowest target size quartile. The incremental revaluation induced by financial bidders for small targets is economically and statistically significant (about 34%), but that of strategic bidders is much lower (11%) and statistically insignificant. An *F*-test confirms that the revaluation attached to financial bidders for small targets is larger than that attributed to strategic bidders for the same size group. Further, both in Columns 1 and 2, the coefficient on *Financial* is economically small and statistically insignificant suggesting that, for larger target firms, the two bidder types do not seem to play any differential role in revealing underpricing.[26]

Next, we evaluate whether the revaluation effect concentrates in certain type of financial bidders. In Columns 3 and 4, we focus on private equity, *PE*. The results mirror those of previous columns but with a larger revaluation effect of close to 50% around failed bids associated with private equity for small targets. This result can be rationalized in the context of the literature on private equity investors, and it is consistent with private equity firms capitalizing on their skills to exploit underpricing more than other bidders do. Upon bidding they reveal this underpricing.

In all regressions, we control for the medium of payment with the variable *Cash*.[27] The rationale to include *Cash* in the regressions as a control comes from Malmendier et al. (2016) who provide evidence consistent with the choice of cash payment revealing information to the market about the stand-alone value of the target. We find a positive and significant coefficient on *Cash*. Bids involving cash payment (greater than 50% of the total payment) induce target revaluation of about 11% after deal failure. It is worth noting that the coefficient on *Cash* is lower than that on *Financial* × *SizeQ*1. The magnitude of the revaluation unlocked by financial bidders for small targets is significant and beyond

[24] See for example, Officer (2003), Bates and Lemmon (2003), Malmendier et al. (2016) and so forth.

[25] Karolyi and Liao (2017) also include premium as a control variable when studying valuation (CARs upon bid announcement) differences by bidder types, although they compare government-controlled bidders with corporate bidders.

[26] Blomkvist and Korkeamäki (2017) in a concise letter find results opposite to ours, that is, targets of financial bidders on average experiencing a smaller revaluation than those of strategic bidders. They use a sample that is one third of ours, without adjusting SDC's misclassification of bidder type as described in Sample Construction (Section 2.1), or exploring the role of target size. When we replicate their multivariate analysis, we do not find the negative association between financial bidders and revaluation as documented in their paper.

[27] Our estimation of the coefficient on *Cash* is about 11%, not far from the estimation of Malmendier et al. (2016) when both public and private acquirers are included.

TABLE 3 Revaluation: Baseline regressions

	Target CARs ($B-25, F+25$)							
	All sample				Pay in cash = 100%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial	0.01	0.01	−0.04	−0.03	−0.01	−0.00	−0.01	0.00
	[0.12]	[0.23]	[−0.54]	[−0.38]	[−0.13]	[−0.07]	[−0.09]	[0.00]
Financial × *SizeQ1* (1)	0.29***	0.34***	−0.01	0.04	0.28**	0.30**	−0.06	−0.04
	[2.59]	[2.93]	[−0.07]	[0.25]	[2.10]	[2.17]	[−0.39]	[−0.26]
PE			0.06	0.05			−0.00	−0.00
			[0.72]	[0.62]			[−0.01]	[−0.05]
PE × *SizeQ1* (2)			0.45**	0.47***			0.51**	0.52**
			[2.57]	[2.63]			[2.54]	[2.58]
Strategic × *SizeQ1* (3)		0.11		0.11		0.04		0.06
		[1.30]		[1.36]		[0.42]		[0.59]
Log(TargetSize)	−0.00	0.02	−0.00	0.02	0.01	0.02	0.01	0.02
	[−0.00]	[0.81]	[−0.00]	[0.85]	[0.50]	[0.68]	[0.49]	[0.76]
Cash	0.11**	0.12**	0.10**	0.11**				
	[2.30]	[2.44]	[2.15]	[2.29]				
Premium	0.28***	0.27***	0.27***	0.27***	0.33***	0.33***	0.30***	0.30***
	[5.18]	[5.07]	[5.05]	[4.92]	[4.30]	[4.32]	[3.83]	[3.85]
Hostile	0.18***	0.18***	0.18***	0.17***	0.16**	0.16**	0.15**	0.15**
	[3.73]	[3.58]	[3.60]	[3.44]	[2.48]	[2.42]	[2.36]	[2.28]

(Continues)

TABLE 3 (Continued)

	Target CARs ($B-25, F+25$)							
	All sample				Pay in cash = 100%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TenderOffer	0.17***	0.17***	0.18***	0.18***	0.13**	0.13***	0.14***	0.14***
	[3.83]	[3.87]	[4.02]	[4.07]	[2.57]	[2.61]	[2.74]	[2.79]
Constant	−0.24*	−0.35**	−0.23	−0.34**	−0.34**	−0.38**	−0.32**	−0.38**
	[−1.74]	[−2.22]	[−1.64]	[−2.16]	[−2.14]	[−2.11]	[−2.00]	[−2.08]
Observations	795	795	795	795	452	452	452	452
Adjusted R-squared	0.16	0.16	0.17	0.17	0.13	0.13	0.15	0.14
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y
F-test (p-value):(1) = (3)		0.05				0.09		
F-test (p-value):(2) = (3)				0.06				0.04

Note: This table reports ordinary least squares (OLS) regressions on *CARs* computed over the ($B-25, F+25$) window. *Financial* (*Strategic*) equals one for bids initiated by financial (strategic) bidders and zero otherwise. *PE* equals one for bids initiated by private equity and zero for other bidders. SizeQ1 equals one if the target market capitalization is ranked in the lower quartile. *Log(TargetSize)* is the natural logarithm of the target market capitalization in millions of dollars 4 calendar weeks prior to the bid announcement, adjusted for inflation using Consumer Price Index conversion factor to dollars of 2014. *Cash* equals one for bids where more than half of deal value is to be paid in cash. *Premium* is bidder's offer price divided by target's market value of equity 4 calendar weeks prior to the bid announcement and truncated between zero and two. *Hostile* and *TenderOffer* are dummy variables indicating a bid in which the bidder's attitude is hostile or tender offer is involved. Year dummies are based on the bid announcement year. Industry dummies are based on one-digit Standard Industrial Classification (SIC) codes. Columns 1–4 refer to the whole sample. Columns 5–8 include only bids to be paid fully in cash. Heteroskedasticity-robust t-statistics are in brackets.

***, ** and * indicate 1%, 5% and 10% significance, respectively.

the revaluation revealed by the medium of payment. Thus, bidder identity seems to matter beyond the medium of payment. Although the signaling role of cash outlined in Malmendier et al. (2016) is reasonable in the context of strategic bidders that can choose how to pay for a deal, it may apply less to financial bidders because they tend to pay only with cash. While the medium of payment signals underpricing in strategic-led bids, our evidence suggests it is bidder identity that signals underpricing for small targets. We further note that the signs of coefficients on all other control variables are largely consistent with previous studies.

To directly evaluate whether the identity of the bidder conveys information to the market about the stand-alone value of the target beyond the medium of payment, we narrow our sample to cash-only bids and report results in Columns 5 to 8. All in all, the effects that we have uncovered remain in terms of magnitude and significance for the cash-only subsample. Thus, with targets that are more likely to be underpriced, the bidder type conveys information to the market about the stand-alone value of the target beyond what is conveyed by the medium of payment, the offer premium, the hostile attitude and a tender offer.

To make sure that our inference is not misstated, we extend our analysis and perform additional tests. If financial and strategic bidders are driven by different motives, have different choices when bidding for a target or induce different market reactions, then imposing the same slopes on all control variables, as we do in the baseline specification, may be inadequate. To account for that, in unreported tests, we interact all controls with *Financial*, and our findings remain virtually unchanged. We also explore the role of target size by looking at other size quantiles both for financial and strategic bidders, but we find no evidence that, for larger target firms, the two bidder types play any differential role in revealing underpricing.

Summing up, results show that failed bids by financial bidders, precisely private equity bidders, are associated with a higher revaluation than failed bids by strategic bidders when target firms are small. We interpret this finding as evidence that underpricing is attractive to private equity firms and financial bidders, when target firms are small, and that to a larger extent than to strategic bidders. Upon bidding on small targets, the identity of the bidder seems to convey information to the market about the stand-alone value of the target firm beyond the information conveyed by the medium of payment.

4 | ROBUSTNESS TESTS AND FURTHER ANALYSIS

The revaluation effect we uncover so far requires further examination because we may attribute it falsely to mispricing signaled by financial bidders when there could be other drivers explaining it. We identify three alternative interpretations that are potentially plausible. First, target revaluation could be the result of differential sorting into deal failure. Second, the revaluation effect could simply be the outcome of the anticipation of future offers. Third, it could be due to the anticipation of future operating improvements. We note, however, that for these alternative explanations to be valid, they must be more relevant for financial-led bids for small targets than for the other bidder type groupings. For example, if financial-led bids for small targets tend to fail more often due to good news about the target, or because those bids are more likely to be followed by future offers, then our conclusion may be premature. In what follows, we address these three concerns in detail.

4.1 | Is target revaluation due to differential sorting into deal failure?

In our setup, we should be concerned if there is a differential sorting into deal failure and bidder type is correlated with failure reasons. For example, value-relevant news released during the bid-to-fail period can reduce the attractiveness of the target and cause deal termination. This can be particularly problematic if the news is correlated to bidder type. Typical value-driven news includes announcements of stock repurchase‘s, approvals of a new patents, reports on technology breakthroughs affecting an entire industry and so forth. By value-driven news being correlated with a certain type of bidder, we mean that financial-led bids fail due to news that increases target price, while strategic-led bids fail for news unrelated to target price changes. This can happen when, for example, entrenched management or block shareholders of targets, perceiving financial bidders as a bigger threat to their own interest than strategic bidders, are incentivized to release good news to defend against financial bids.[28] If financial-led bids fail for reasons that lead to target price increases while strategic-led bids fail for reasons unrelated to target price changes, we may falsely associate bidder type to revaluation when the results are driven by the overproportion of financial-led bids that fail due to value-increasing news. We note, however, that differential sorting into deal failure would weaken our conclusion only if failure reasons are different between financial bids for small targets and other groups of bidder-target pairs.

To address this concern, we follow two routes. First, we evaluate whether news-driven price movements during the bid-to-fail period explain our results. Second, we manually search news to directly identify the reason for failure.

To investigate to what extent news has a bearing on our interpretation, we evaluate whether financial bidders' differential revaluation effect remains after controlling for news-driven price movements. To identify news-driven price movements, we take a similar approach to that used in Savor (2012). Specifically, for every bid, we evaluate daily abnormal returns during the bid-to-fail period [B + 4, F]. A large daily abnormal return for a given target suggests that a value-relevant event has led to a restatement of the target fundamental value. If the revaluation effect is mainly triggered by target positive news during the bid-to-fail period, instead of by bidder type, we should observe that (1) large target price shocks are positively associated with revaluation; (2) a revaluation effect previously attached to financial bidder type dissipates in the presence of large target price shocks. In that sense, we create a new variable *AR [B + 4, F]* that takes the value of the largest daily abnormal return during the bid-to-fail period. We then use this variable as an additional control in base regressions. Following the logic that the revaluation is related to positive news that occurs before failure, we would expect this control to have a positive coefficient. We also include *NegAR [B + 4, F]* that equals one if the target stock price experiences a large negative abnormal return of more than −1% during the bid-to-fail period. This variable aims to control for the presence of a large negative return that may cancel the impact of large positive returns.

Table 4 confirms our conjecture. The coefficient on *AR [B+4, F]* is positive and significant across all specifications. The presence of positive price shocks within the bid-to-fail period is indeed associated with larger revaluation effects. Also, as expected, the coefficient on *NegAR* across specifications is negative and significant. However, the addition of these controls does not alter our previous findings. *Financial* × *SizeQ*1 is still positive, of similar magnitude and statistically significant. Thus, the bidder-type revaluation difference for small targets persists, and it is associated mainly with private equity bidders. Thus, our results are not driven by an over presence of financial-led bids for small targets in the group of bids experiencing price shocks.[29]

We also follow a second approach and build on existing studies; see Savor and Lu (2009) and Malmendier et al. (2016). This method involves news search to directly identify the reason for failure. Our objective is two-fold. On the one hand, we want to evaluate whether the revaluation differences between financial-led and strategic-led bids for small targets do hold for exogenous failure reasons, that is, reasons unrelated to target news. On the other hand, we want to verify that even if failure is related to target news, it does affect financial and strategic acquirers bidding for small targets in a different way. That is, our conclusion will be robust as long as bidder type revaluation differences persist across failure reasons. Last, this exercise also allows us to rule out the possibility that financial-led bids for small targets cluster on failure reasons that have attached a larger revaluation.

For this analysis, we hand-collect detailed information on failure reasons from the SDC deal synopsis and SDC event history and complement the search with news from Lexis/Nexis. We then classify failed bids according to their cause and form three groups. The first *"No more information"* subgroup includes bids that failed for no public reasons and for which we cannot identify the cause of failure. The second *"Exogenous"* includes bids that failed for exogenous reasons and thus the failure should be unrelated to the target stock price. Failure reasons in this group are unlikely to

[28] There is sufficient evidence that firms consciously release news to influence stock prices. See Ahern and Sosyura (2014) for recent evidence.

[29] Results are robust to alternative definitions of price shocks.

TABLE 4 Revaluation and value-relevant news released during the bid-to-fail period

	Target CARs ($B-25, F+25$)							
	All sample				Pay in cash = 100%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial	−0.00	0.00	−0.05	−0.04	−0.01	−0.01	−0.02	−0.01
	[−0.05]	[0.07]	[−0.69]	[−0.53]	[−0.23]	[−0.11]	[−0.28]	[−0.13]
Financial × *SizeQ1* (1)	0.29***	0.34***	−0.02	0.03	0.28**	0.31**	−0.08	−0.05
	[2.74]	[3.08]	[−0.17]	[0.18]	[2.15]	[2.35]	[−0.54]	[−0.31]
PE			0.06	0.05			0.01	0.00
			[0.76]	[0.67]			[0.11]	[0.04]
PE × *SizeQ1* (2)			0.47***	0.49***			0.53***	0.55***
			[2.87]	[2.92]			[2.82]	[2.89]
Strategic × *SizeQ1* (3)		0.11		0.11		0.08		0.10
		[1.34]		[1.39]		[0.81]		[1.00]
AR[B + 4, F]	1.94***	1.94***	1.98***	1.98***	1.70***	1.73***	1.80***	1.84***
	[4.53]	[4.52]	[4.62]	[4.61]	[3.16]	[3.24]	[3.32]	[3.41]
NegAR[B + 4, F]	−0.27***	−0.27***	−0.27***	−0.27***	−0.23**	−0.23***	−0.22**	−0.23***
	[−3.79]	[−3.85]	[−3.78]	[−3.84]	[−2.56]	[−2.63]	[−2.54]	[−2.64]

(Continues)

TABLE 4 (Continued)

	Target CARs ($B-25, F+25$)							
	All sample				Pay in cash = 100%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	−0.22	−0.33**	−0.21	−0.33**	−0.33*	−0.41**	−0.32*	−0.41**
	[−1.58]	[−2.12]	[−1.51]	[−2.08]	[−1.80]	[−2.03]	[−1.73]	[−2.07]
Observations	795	795	795	795	452	452	452	452
Adjusted R-squared	0.19	0.19	0.20	0.20	0.16	0.16	0.17	0.17
Other controls included	Y	Y	Y	Y	Y	Y	Y	Y
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y
F-test (p-value)(1) = (3)		0.04				0.12		
F-test (p-value):(2) = (3)				0.04				0.04

Note: This table reports OLS regressions on *CARs* computed over the ($B-25, F+25$) window. We replicate Table 3 and add two additional controls to account for the possible effect of value relevant news, occurring during the bid-to-fail period on the revaluation effect. *AR* takes the value of the largest daily abnormal return during the bid-to-fail period [$B+4, F$] and *NegAR* is an indicator variable that equals one if there is a large daily negative abnormal return of more than −1 % over this period. *Financial* (*Strategic*) equals one for bids initiated by financial (strategic) bidders and zero otherwise. *PE* equals one for bids initiated by private equity and zero for other bidders. SizeQ1 equals one if the target market capitalization is ranked in the lower quartile. All other controls (*Log(TargetSize)*, *Cash*, *Premium*, *Hostile and TenderOffer)* are included in all regressions and defined in Table 3. Year dummies are based on the bid announcement year. Industry dummies are based on one-digit SIC codes. Columns 1–4 refer to the whole sample. Columns 5–8 include only bids to be paid fully in cash. Heteroskedasticity-robust t-statistics are in brackets.

***, ** and * indicate 1%, 5% and 10% significance, respectively.

convey information on the value of the target beyond the fact that the bid will not reach completion, and therefore the anticipated value will not be created. The third *"Other"* includes all other failed bids the failures of which could be endogenously related to the target stock price, making it more difficult to draw conclusions. In this last group, the focus is mainly on the existence of a differential revaluation across failure reasons. In the "*Exogenous*" and "*Other*" groups, we further form categories by failure reason. Table 5 provides details on these categories. The *"Exogenous"* group unfolds three categories. *Term mutually disagree* contains bids with withdrawal news stating that terms are modified but eventually both bidder and target agree to terminate the negotiation. No further information is available on which term is modified or what drives both parties' decision to withdraw. *Bidder no financing* refers to bids that fail because the bidder has difficulties in financing the deal. *Regulator reject* includes bids that failed to obtain approval from regulatory authorities.

In contrast, *"Other"* includes failure reasons that are likely to have value implications that result in failure. *Bidder withdraw* refers to bids terminated by bidders either during due diligence or at any other phase of the bid negotiation. Bids terminated by the bidder might signal bad news about the underlying value of the target especially if the withdrawal occurs during due diligence. *Target released news* includes failed bids where news about the target is released during the bid-to-fail period, for instance, earnings announcements, other accounting information, plans for new projects, updates on court rulings and so on. This category also includes failed bids where bidders terminate because of recently released news about the target firm. Good or bad, these confounding pieces of news make it hard to formulate inferences about the revaluation effect at bid failure. *Board reject* covers bids that are vetoed by the target board, and in some cases, the board of directors argues that the offer price is inadequate. *Shareholder reject* includes bids vetoed by shareholders as well as bids with an insufficient number of target shares tendered before expiration. These two last categories can signal that shareholders and management of target firms believe the firm's fair value should be higher than the offer price or, alternatively, can be related to conflicts of interest where a majority block holder does not welcome the offer.

Table 5 reports key results of the news search by bidder groups *Financial* × *SizeQ*1, *PE* × *SizeQ*1 and *Strategic* × *SizeQ*1. We directly report results for the "cash-only sample."[30] *N* indicates the sample size by failure category and *% of N* refers to the fraction of bids that failed for a given reason. For each category, we re-estimate the differential revaluation effect for *Financial* × *SizeQ*1, *PE* × *SizeQ*1 and *Strategic* × *SizeQ*1. *Coefficient* is the slope coefficient that results from specification (6) in Table 3 for *Financial* × *SizeQ*1 and from specification (8) for *PE* × *SizeQ*1 and *Strategic* × *SizeQ*1. Given the small sample sizes for some categories, in these estimations, we do not add year and industry dummies. All other controls are included. The coefficient captures any differential revaluation loaded on each subgroup. It is left empty if there are insufficient observations to run a regression. The discrepancy in sample size between the *Full sample* and *Table 3* is due to cases that are insufficient tender offers after board rejection. Those cases are counted in both *Board reject* and *Shareholder reject*. Given the small sample size in some of the categories, we need to be cautious with the interpretation of the results.

We are most interested in the outcome of the group *"Exogenous"* but, unfortunately, we identify only few cases. This group presents consistent signs of coefficients, but they are statistically insignificant. Given the small sample size, we cannot rule out the possibility that insignificance results from a lack of power, which makes it hard to draw any conclusion. The group of "*No more information*" shows a revaluation effect associated with financial-led (and private-equity-led, short for "PE-led") bids for small targets that are positive, significant and larger than that for strategic-led bids. Subject to the caveat that we cannot rule out that private information may be at play and move prices, absent of public information about deal failure, this result supports our findings of bidder type informational effects. Regarding the group "*Other*" and the category of *"Shareholder reject"* that includes most observations, the differential revaluation for *Financial* × *SizeQ*1 is significant and that for *PE* × *SizeQ*1 is even stronger. Furthermore, these results are signifi-

[30] The results are qualitatively similar for the whole sample.

TABLE 5 Revaluation and failure reasons

Panel A: Regression by failure reasons	*Financial × SizeQ1*			*PE × SizeQ1*			*Strategic × SizeQ1*		
	N	*% of N*	Coef.	*N*	*% of N*	Coef.	*N*	*% of N*	*Coef.*
(1) *No more information*	**10**	**26%**	**0.57****	**9**	**30%**	**0.63****	**7**	**12%**	**0.36**
(2) *Exogenous*	**5**	**13%**	**0.2**	**2**	**7%**	**0.2**	**3**	**5%**	**–0.66****
(2.1) *Term mutually disagree*	2	5%	0.49	1	3%		2	3%	–0.26
(2.2) *Bidder no financing*	2	5%	0.92	0	0%		1	2%	
(2.3) *Regulator reject*	1	3%		1	3%		0	0%	
(3) *Other*	**24**	**62%**	**0.29****	**19**	**63%**	**0.52*****	**48**	**83%**	**0.13**
(3.1) *Industry or market problem*	0	0%		0	0%		4	7%	0
(3.2) *Bidder withdraw*	2	5%	0.37	2	7%	0.4	7	12%	–0.24
(3.3) *Target released news*	0	0%		0	0%		0	0%	
(3.4) *Board reject*	6	15%	–0.16	5	17%	–0.29	12	21%	0.04
(3.5) *Shareholder reject*	20	51%	0.44***	12	40%	0.80***	25	43%	0.26**
Full sample	**39**	**100%**	**0.34****	**30**	**100%**	**0.52*****	**58**	**100%**	**0.15**
Table 2&3 Pay in cash = 100%	38		0.30**	26		0.48***	48		0.07

(Continues)

TABLE 5 (Continued)

Panel B: Distribution of observations	Financial		PE		Strategic	
	N	*% of N*	*N*	*% of N*	*N*	*% of N*
(1) *No more information*	**52**	**21%**	**45**	**23%**	**78**	**23%**
(2) *Exogenous*	**22**	**9%**	**14**	**7%**	**23**	**7%**
(2.1) *Term mutually disagree*	3	1%	2	1%	4	1%
(2.2) *Bidder no financing*	5	2%	2	1%	3	1%
(2.3) *Regulator reject*	14	6%	10	5%	16	5%
(3) *Other*	**176**	**70%**	**138**	**70%**	**243**	**71%**
(3.1) *Industry or market problem*	0	0%	0	0%	4	1%
(3.2) *Bidder withdraw*	15	6%	11	6%	21	6%
(3.3) *Target released news*	0	0%	0	0%	1	0%
(3.4) *Board reject*	64	26%	53	27%	91	26%
(3.5) *Shareholder reject*	97	39%	74	38%	126	37%
Full sample	**250**	**100%**	**197**	**100%**	**344**	**100%**
Table 2 Pay in cash = *100%*	192		149		260	

Note: This table reports OLS regressions on *CARs* computed over the $(B-25, F+25)$ and sample distribution by failure reasons. In Panel A, for each failure category, coefficients in columns labeled "*Financial* × *SizeQ*1" and "*Strategic* × *SizeQ*1" are estimated using the specification (6) in Table 3, and those labeled with "*PE* × *SizeQ*1" are based on specification (8). In these regressions, we exclude year and industry dummies but all other controls are included. *Coef.* is the revaluation effect loading on each subgroup and it is left blank if observations are too few for an estimation. *N* (*% of N*) reports the number (fraction) of observations for the corresponding failure category. Panel B reports the number (*N*) and fraction (*% of N*) of observations by failure category for *Financial*, *PE* and *Strategic*.

***, ** and * indicate 1%, 5% and 10% significance, respectively.

cantly larger than those for *Strategic* × *SizeQ*1. However, it is hard to say anything for the other categories given the small sample sizes.[31]

From a different angle, if differential revaluation was driven by differential sorting into failure reasons for the bidder group *Financial* × *SizeQ*1 *(or PE* × *SizeQ*1) than for other bidder groups, we would observe that the distributions of observations across failure categories differ significantly across those bidder groups. In Panel B of Table 5, we note that there is a similar distribution of failure reasons for financial and strategic bidders within the lowest size quartile. The unreported analysis also indicates that there are no substantial differences in the distribution of observations across failure reasons between deals involving small versus larger targets by financial bidders.[32]

We acknowledge that the search and classification of failed bids into failure categories involve a large degree of judgment. Nevertheless, all analyses put together indicate that sorting into bid failure is unlikely to invalidate our interpretation. Rather, our tests show that the differential revaluation for PE-led bids for small targets is robust. Therefore, we can more reassuringly infer that the bidder type conveys information to the market about the stand-alone value of target firms, especially when target firms are small.

4.2 | Is target revaluation driven by future bids?

In the context of tender offers, Bradley et al. (1983) suggest that the revaluation effect is due to the anticipation of future bids rather than to informational effects. Extending this statement beyond tender offers, we could argue that some target firms subject to failed bids may have a high probability of being acquired in the future, and this anticipation results in revaluation at bid failure. To be a valid explanation for our results, this should imply that the differential revaluation effect that we attribute to bidder type may be alternatively explained by the anticipation of future bids. That is, financial-led failed bids, and in particular bids by private equity and for small targets, may be more likely to be acquired in the future. To some degree, we have controlled for market anticipation of subsequent future offers by adding the controls *TenderOffer* and *Hostile* in our base regressions. This section provides additional tests to investigate in detail the role of the anticipation of future bids, which can be factored into target revaluation in two ways: via the timing or the size of the offer premium of expected subsequent completed bids. For instance, holding other variables constant, a completed bid in 2 years' time would imply a higher revaluation of target shares than one taking place in 10 years' time. Likewise, a 30% premium should imply an *ex-ante* larger revaluation than a 10% premium. We account for these two dimensions separately.

To analyze the effect of time until a subsequent completed acquisition on revaluations, we conduct a survival analysis and use a Cox proportional-hazard regression.[33] We use this method to test whether survival time is related to bidder type. For each target firm in the sample, we define the observation period as the time interval between the withdrawal date and the censoring date. The censoring date is the effective date of a target's subsequent and successful acquisition. If a target firm is delisted before any subsequent completed acquisition, its censoring date is set to its official delisting date. If a target firm continues to be listed but is not acquired by any future bidder, its censoring date is set to be the last trading date in our sample, June 30, 2016. To model how fast a future acquisition arrives, if it takes place, we compute hazard ratios. For each year, we estimate the hazard rate of being acquired as the probability of being acquired in year *t* conditional on not being acquired prior to *t*. Next, we run Cox proportional-hazard regressions and report results in Table 6. In these tests, the dependent variable is the rate of subsequent completed acquisitions following a bid failure. The independent variables of interest include bidder type, its interactions with *SizeQ*1 and *CARs*.

[31] The results remain qualitatively similar if the estimations are based on alternative specifications in Table 3.

[32] Similar to Panel A, the discrepancy of sample size between *Full sample* and *Table 2&3* is due to cases that are insufficient tender offers after board rejection. Those cases are counted in both *Board reject* and *Shareholder reject*.

[33] A survival analysis suits this setting better than a logistic regression because it not only accommodates the presence or absence of a future acquisition, but also, and more relevant to this context, it examines how fast the event arrives if it takes place. See Allison (2010) for a more detailed discussion on survival analysis techniques.

TABLE 6 Anticipation of future bids: Time until a subsequent completed acquisition

	Completed acquisitions following a bid failure							
	All sample				Pay in cash = 100%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial	−0.12	−0.19	−0.03	−0.10	−0.18	−0.29	0.26	0.12
	[−0.75]	[−1.16]	[−0.11]	[−0.38]	[−0.96]	[−1.50]	[0.84]	[0.41]
Financial × *SizeQ1* (1)	−0.09	−0.39	−0.43	−0.69	0.33	−0.12	−0.65	−1.04
	[−0.24]	[−1.01]	[−0.64]	[−1.03]	[0.73]	[−0.24]	[−0.78]	[−1.23]
PE			−0.12	−0.11			−0.62*	−0.59*
			[−0.41]	[−0.38]			[−1.77]	[−1.69]
PE × *SizeQ1* (2)			0.48	0.43			1.42	1.35
			[0.63]	[0.56]			[1.52]	[1.44]
Strategic × *SizeQ1* (3)		−0.76**		−0.76**		−0.99**		−0.97**
		[−2.76]		[−2.75]		[−2.58]		[−2.51]
CARs	0.28**	0.33**	0.28**	0.33**	0.72***	0.73***	0.74***	0.75***
	[2.07]	[2.37]	[2.07]	[2.36]	[3.40]	[3.45]	[3.47]	[3.51]
Target q	−0.13***	−0.14***	−0.13***	−0.14***	−0.19***	−0.19***	−0.18***	−0.18***
	[−3.18]	[−3.29]	[−3.19]	[−3.29]	[−2.78]	[−2.78]	[−2.70]	[−2.71]
Target leverage	−0.19*	−0.21*	−0.20*	−0.22*	−0.21	−0.21	−0.23	−0.23

(Continues)

TABLE 6 (Continued)

	Completed acquisitions following a bid failure							
	All sample				Pay in cash = 100%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	[−1.72]	[−1.87]	[−1.77]	[−1.90]	[−1.35]	[−1.35]	[−1.47]	[−1.47]
Target ROA	0.41	0.51	0.42	0.52	1.40	1.24	1.51	1.37
	[0.60]	[0.73]	[0.61]	[0.75]	[1.30]	[1.12]	[1.39]	[1.24]
Observations	548	548	548	548	336	336	336	336
Other controls included	Y	Y	Y	Y	Y	Y	Y	Y
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y
F-test (*p*-value):(1) = (3)		0.37				0.09		
F-test (*p*-value):(2) = (3)				0.28				0.02

Note: This table reports Cox proportional-hazard regression results. It estimates the marginal effect of variables on the rate of subsequent completed acquisitions following a bid failure (our dependent variable). *Financial* (*Strategic*) equals one for bids initiated by financial (strategic) bidders and zero otherwise. *PE* equals one for bids initiated by private equity and zero for other bidders. *SizeQ*1 equals one if the target market capitalization is ranked in the lower quartile. *CARs* is the cumulative abnormal return computed over the ($B - 25, F + 25$) window. *Target q* is target market capitalization over book value of equity. *Target leverage* is target long-term debt over target market capitalization. *Target ROA* is target earnings before interest and taxes over total assets. All other controls (*Log(TargetSize)*, *Cash*, *Premium*, *Hostile and TenderOffer)* are included in all regressions and defined in Table 3. Year dummies are based on the bid announcement year. Industry dummies are based on one-digit SIC codes. Columns 1–4 refer to the whole sample. Columns 5–8 include only bids to be paid fully in cash. The coefficients that we report are the log of hazard ratios. *z*-statistics are in brackets.

***, ** and * indicate 1%, 5% and 10% significance, respectively.

We also include the set of control variables and the target *q*, *leverage* and *ROA*, which are standard predictors of acquisition activity. The coefficients that we report are the log of hazard ratios. If bidder type *Financial* or *PE* (private equity) and its interaction with *SizeQ*1 predict the incidence of future bids, we would expect a positive and significant loading on these variables. Similarly, we would expect the revaluation at bid failure (*CARs*) to be positive and statistically significant. Table 6 confirms that a high revaluation predicts a higher rate of subsequent completed acquisitions. However, specifications both for the whole sample and for the cash-only subsample show that there is no differential positive effect associated with financial- or PE-led bids for small targets.[34] Financial- and PE-led bids for small targets are not subsequently acquired faster than larger targets.

To analyze the effect of the offer premium in future acquisitions on revaluations, we regress future expected premium on bidder type, the usual set of explanatory variables and *CARs*. We proxy for future expected premium using the inflation-adjusted deal value of a subsequent successful bid divided by target market capitalization 4 weeks before initial bid failure.[35] We also account for the medium of payment, premium, bid attitude and tender offer. In addition, we include the number of years between the initial bid failure announcement and the effective date of the subsequent and successful acquisition of the target (*Years*) to partly control for the length of the period until a subsequent offer. Following the logic that the differential revaluation attached to financial and private equity bidders for small targets merely reflects a higher price offered in future completed bids, we would expect a positive and significant coefficient on *Financial* × *SizeQ*1 and *PE* × *SizeQ*1. Table 7 reports the results. The coefficients on financial bidder types for small targets are not significant and often negative in the cash-only sample. These findings suggest that our interpretation is robust after controlling for possible anticipation effects of future acquisitions.[36]

The differential speed of or value paid in future acquisitions does not explain the differential revaluation for *Financial*- and *PE*-led bids for small targets vis-à-vis other larger targets. Still, when *Financial*- and *PE*-led bids for small targets fail, it is possible that the market anticipates a subsequent bid by a strategic bidder at a higher price even if such a bid is not realized later on. Because financial bidders tend to pay lower prices than strategic bidders (who also pay for synergies), the expectation of the market may be that a failed financial bid is likely to be followed by a strategic bidder paying a higher premium for the target. However, as the expected future bid becomes unlikely, the price should correct accordingly, and the differential revaluation should revert in the long term. To examine this possibility, we follow Malmendier et al. (2016) and use the calendar-time portfolio approach to estimate the long-run abnormal returns of targets over 3, 6 and 12 months after bid failure.[37] We construct equal-weighted portfolios by including targets that receive a bid failure announcement in the previous month and keep them in the portfolios for the next 3, 6 and 12 months. Then, we obtain alphas from regressing target returns on local market indices. To incorporate the time-varying nature in the number of target firms in the portfolios, we use weighted least squares regressions (WLS), where the number of target firms in the portfolio determines the weights.

Table 8 presents the results. Columns labeled "3 months," "6 months" and "12 months" report alphas from WLS regressions over estimation periods of 3, 6 and 12 months, respectively. Statistical significance from *t*-tests is reported in brackets. We find that all alphas for groups *Financial* × *SizeQ*1 and *PE* × *SizeQ*1 are statistically insignificant for each horizon. This means that the revaluation difference between small firms targeted by financial (private equity) bidders and other targets is unlikely to revert in the post-failure period. Thus, our results are more consistent with mispricing than with differential anticipation of future bids at higher prices.

[34] Results hold in alternative specifications where we drop CARs as control variables, or we interact CARs with bidder type.

[35] The advantage of using the target market capitalization before bid failure to normalize future premium enables alignment with other control variables in terms of time.

[36] In unreported tests, we substitute *Log(Targetsize)* by *SizeQ*1 interacted with bidder type. We also interact *CARs* with bidder type. These alternative specifications do not have any bearing on the results.

[37] Using a buy-and-hold approach delivers similar results.

TABLE 7 Anticipation of future bids: Expected deal value in future completed acquisitions

	Future completed deal value scaled by target market capitalization							
	All sample				Pay in cash = 100%			
	(1)	(3)	(4)	(6)	(7)	(9)	(10)	(12)
Financial	0.19	0.19	0.32	0.31	0.26	0.31*	0.30	0.35
	[1.17]	[1.13]	[1.20]	[1.16]	[1.50]	[1.75]	[1.20]	[1.37]
Financial × *SizeQ*1 (1)	0.26	0.23	0.24	0.21	−0.04	0.10	−0.40	−0.26
	[0.75]	[0.63]	[0.61]	[0.53]	[−0.12]	[0.25]	[−0.58]	[−0.35]
PE			−0.17	−0.17			−0.08	−0.09
			[−0.58]	[−0.56]			[−0.29]	[−0.30]
PE × *SizeQ*1 (2)			0.03	0.04			0.52	0.53
			[0.05]	[0.06]			[0.65]	[0.62]
Strategic × *SizeQ*1 (3)		−0.11		−0.10		0.53		0.53
		[−0.34]		[−0.31]		[1.61]		[1.61]
CARs	0.38**	0.39**	0.38**	0.38**	0.51**	0.50**	0.49**	0.48**
	[2.34]	[2.39]	[2.35]	[2.38]	[2.42]	[2.48]	[2.30]	[2.36]
Target q	−0.04	−0.04	−0.04	−0.04	0.01	0.02	0.01	0.01
	[−0.69]	[−0.71]	[−0.69]	[−0.70]	[0.09]	[0.15]	[0.08]	[0.13]
Target leverage	0.10	0.09	0.09	0.09	−0.17	−0.14	−0.17	−0.15
	[0.76]	[0.74]	[0.72]	[0.70]	[−0.99]	[−0.83]	[−1.01]	[−0.86]

(Continues)

TABLE 7 (Continued)

	Future completed deal value scaled by target market capitalization							
	All sample				Pay in cash = 100%			
	(1)	(3)	(4)	(6)	(7)	(9)	(10)	(12)
Target ROA	−0.20	−0.20	−0.19	−0.19	−2.33**	−2.33**	−2.29**	−2.29**
	[−0.22]	[−0.22]	[−0.22]	[−0.22]	[−2.06]	[−2.07]	[−2.01]	[−2.02]
Years between	0.10***	0.10***	0.10***	0.10***	0.12***	0.12***	0.12***	0.12***
	[5.04]	[5.02]	[4.99]	[4.98]	[5.61]	[5.65]	[5.49]	[5.53]
Observations	287	287	287	287	169	169	169	169
Adjusted R-squared	0.591	0.588	0.589	0.589	0.636	0.631	0.633	0.633
Other controls included	Y	Y	Y	Y	Y	Y	Y	Y
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y
F-test (p-value):(1) = (3)		0.43				0.37		
F-test (p-value):(2) = (3)				0.84				1.00

Note: This table reports OLS regression on the future deal value that a target firm eventually receives from a completed acquisition after the initial bid failure. Deal value is scaled by target market capitalization 4 calendar weeks prior to bid announcement. *Financial* (*Strategic*) equals one for bids initiated by financial (strategic) bidders and zero otherwise. *PE* equals one for bids initiated by private equity and zero for other bidders. *SizeQ*1 equals one if the target market capitalization is ranked in the lower quartile. *CARs* is the cumulative abnormal return computed over the ($B-25$, $F+25$) window. *Target q* is target market capitalization over book value of equity. *Target leverage* is target long-term debt over target market capitalization. *Target ROA* is target earnings before interest and taxes over total assets. *Years between* stands for the number of years it takes from current deal failure to the date the target is acquired. All other controls (*Log(TargetSize)*, *Cash*, *Premium*, *Hostile and TenderOffer)* and a constant are included in all regressions and defined in Table 3. Year dummies are based on the bid announcement year. Industry dummies are based on one-digit SIC codes. Columns 1–4 refer to the whole sample. Columns 5–8 include only bids to be paid fully in cash. Heteroskedasticity-robust t-statistics are in brackets.

***, ** and * indicate 1%, 5% and 10% significance, respectively.

TABLE 8 Post-failure target abnormal returns

	Long-term target revaluation					
	All sample			Pay in cash = 100%		
	3 months	6 months	12 months	3 months	6 months	12 months
	(1)	(2)	(3)	(4)	(5)	(6)
Financial × *SizeQ*1	0.005	0.005	0.003	0.002	0.000	−0.003
	[0.54]	[0.83]	[0.51]	[0.17]	[0.05]	[−0.47]
Observations	173	243	316	118	175	259
Adjusted *R*-squared	0.05	0.02	0.03	0.05	0.03	0.04
PE × *SizeQ*1	0.008	0.005	−0.001	0.008	0.003	−0.005
	[0.70]	[0.59]	[−0.16]	[0.48]	[0.25]	[−0.76]
Observations	126	181	256	88	139	216
Adjusted *R*-squared	0.03	0.02	0.02	0.03	0.03	0.03
Strategic × *SizeQ*1	−0.005	−0.014***	−0.013***	0.002	0.004	−0.007
	[−0.82]	[−2.78]	[−3.26]	[0.19]	[0.53]	[−1.59]
Observations	244	302	343	107	148	197
Adjusted *R*-squared	0.06	0.02	0.03	0.03	−0.00	0.03
Other Financial	−0.005	−0.004	−0.003	−0.007	−0.005	0.002
	[−1.27]	[−1.31]	[−1.33]	[−1.63]	[−1.64]	[0.82]
Observations	571	776	954	369	554	764
Adjusted *R*-squared	0.04	0.07	0.12	0.04	0.09	0.08
Other Strategic	−0.002	−0.004*	0.001	−0.000	−0.003	−0.001
	[−0.71]	[−1.73]	[0.36]	[−0.05]	[−0.86]	[−0.34]
Observations	707	860	981	362	521	706
Adjusted *R*-squared	0.08	0.11	0.17	0.07	0.08	0.09

Note: This table reports post-failure calendar-time portfolio estimates of alphas. Alphas are obtained from regressing monthly returns of equal-weighted portfolios composed of targets that receive a bid failure announcement in the previous 3, 6 or 12 months on local market indexes. *Financial, PE and Strategic* refer to subgroups of bids initiated by financial, private equity and strategic bidders, respectively. *SizeQ*1 refers to the subgroup of targets with market capitalization ranked in the lower quartile. *Other* refers to the subgroup of targets with market capitalization ranked above the lower quartile. *Observations* is the number of non-empty portfolios and weighted by the number of target firms in each portfolio. Columns 1–3 refer to the whole sample. Columns 4–6 include only bids to be paid fully in cash. *t*-statistics are in brackets.
***, ** and * indicate 1%, 5% and 10% significance, respectively.

4.3 | Is target revaluation driven by the anticipation of future operational improvements?

The anticipation of future operational improvements could also drive revaluation effects. In the context of hostile bids, Hirshleifer and Titman (1990) argue that upon bid failure, targets could learn about and implement policies planned by the bidder. Anticipating this possibility, target prices can adjust. As before, for this to be a source of concern, the anticipation of operational improvements would need to apply only to failed bids by financial bidders, particularly for small targets, and not to those by strategic bidders. Put differently, why would only managers of small firms targeted by financial bidders implement operational adjustments? We can conjecture that financial bidders could have better policies in mind for targets than strategic bidders. So only targets by financial bidders will put those policies in place.

Still, this supposition does not explain why smaller targets may have more incentives to bring operational changes than larger targets. Our tests indicate that the differential revaluation attached to larger targets dissipates upon bid withdrawal.

Under the view that financial bidders are corporate raiders, we can also argue that, after successfully resisting an acquisition attempt, target management will become more disciplined and improve operating performance (Safieddine & Titman, 1999). If unwanted bids by financial bidders wake up target management and make them more engaged, and consequently lead to a revaluation resulting from the anticipation of improved policies, we should observe that this revaluation is more pronounced in hostile bids or bids rejected by the target board of directors.[38] We note that, in Table 3, the positive revaluation effect persists in all specifications even after controlling for a hostile deal attitude. In addition, it is not clear why smaller targets may be more subject to hostility and have more incentives to bring operational amendments.

In Table 9, we subject our conjectures to formal empirical testing and evaluate whether the differential revaluation we attribute to *ex-ante* underpricing of small firms targeted by financial bidders is a reflection of operational changes that these targets experience after bid failure. To do that, we follow Malmendier et al. (2016) and select a number of proxies for operational performance typically used in the literature: debt, capital expenditures, employment and RE&D. For each variable, we compute (1) the change from the calendar year-end before the bid to the calendar year-end after bid failure (2) the change scaled by total assets and (3) the scaled change relative to the change of a control firm matched by country, year, two-digit SIC codes and total assets. For each variable, we regress these three expressions on financial bidder type and its interaction with $SizeQ1$, and the usual set of controls. For ease of exposition, Table 9 reports the results for the coefficients of interest when operational changes are computed as (3). In general, the coefficients on $Financial \times SizeQ1$ and $PE \times SizeQ1$ are insignificant both in the whole sample and in the cash-only sample. In view of the above evidence, the anticipation of future operational improvements does not seem to be a plausible interpretation of our findings.

4.4 | Why is target underpricing concentrated in the group of small firms?

Thus far, we have documented that financial bidders reveal greater prior-bid target underpricing than strategic bidders when targets are small, but we have not discussed what is the economic mechanism behind the small firm size. Literature commonly associates smaller firm size with a poorer information environment (Atiase, 1987) and hence a higher likelihood of underpricing. In an attempt to check for this channel, we follow Karpoff et al. (2013) and replace firm size with alternative proxies for information asymmetry. However, most alternative proxies have a large fraction of missing observations. As a result, our sample shrinks significantly, hindering us from making a strong claim that it is information asymmetry at work.[39]

5 | CONCLUSION

Acquisitions are attempts by bidding firms to exploit not only synergies but also other sources of gains. We find that, upon bid failure, financial-led and strategic-led acquisition bids lead to significantly different target revaluations where target underpricing is concentrated, that is, when target firms are small. We further show that it is private equity bidders who induce larger revaluations than strategic bidders. This finding suggests that private equity firms attempting to buy small targets are more likely associated with underpriced targets than strategic bidders.

[38] When we follow Savor and Lu (2009) and Malmendier et al. (2016) and search news to identify directly the reason for failure, we find that financial bids on small firms are rejected by directors in around 15% cases and are not associated with any significant positive revaluation.

[39] Analysis results using alternative proxies of information asymmetry are available upon request.

TABLE 9 Anticipation of operational changes after bid failure

	All sample								Pay in cash = 100%							
	Δdebt/ta - Δdebt_c/ta_c		Δcapex/ta- Δcapex_c/ta_c		Δemp/ta- Δemp_c/ta_c		Δrd/ta-Δrd_c/ta_c		Δdebt/ta - Δdebt_c/ta_c		Δcapex/ta- Δcapex_c/ta_c		Δemp/ta- Δemp_c/ta_c		Δrd/ta-Δrd_c/ta_c	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Financial	−0.01	0.01	0.10	0.10	0.00*	0.00*	0.02	0.01	−0.04	−0.07	0.10	0.03	0.00	0.00	0.03	0.03
	[−0.29]	[0.11]	[1.25]	[1.10]	[1.91]	[1.75]	[0.48]	[0.27]	[−0.61]	[−0.50]	[0.88]	[0.24]	[1.41]	[0.89]	[0.63]	[0.63]
Financial × *SizeQ1* (1)	0.06	0.04	−0.06	−0.04	−0.00	−0.00	0.02	0.02	0.02	0.02	−0.05	−0.02	−0.00	−0.00	−0.03	−0.01
	[0.68]	[0.24]	[−0.67]	[−0.32]	[−1.38]	[−0.59]	[0.37]	[0.59]	[0.19]	[0.12]	[−0.34]	[−0.09]	[−0.43]	[−0.25]	[−0.48]	[−0.10]
PE		−0.04		0.00		−0.00		0.01		0.04		0.08		−0.00		0.00
		[−0.33]		[0.04]		[−0.87]		[0.48]		[0.31]		[0.46]		[−0.46]		[0.08]
PE ×*SizeQ1* (2)		0.04		−0.04		−0.00		−0.01		0.02		−0.02		0.00		−0.06
		[0.19]		[−0.24]		[−0.35]		[−0.21]		[0.08]		[−0.10]		[0.01]		[−0.74]
Strategic × *SizeQ1* ()	−0.07	−0.07	0.12	0.12	−0.00	−0.00	0.08	0.08	−0.09	−0.09	−0.07	−0.07	0.00	0.00	−0.02	−0.03
	[−0.91]	[−0.89]	[0.98]	[0.97]	[−0.82]	[−0.82]	[1.56]	[1.56]	[−0.79]	[−0.77]	[−0.29]	[−0.28]	[0.00]	[0.01]	[−0.39]	[−0.44]
F-test (*p*-value):(1) = (3)	0.19		0.16		0.76		0.31		0.40		0.92		0.72		0.92	
F-test (*p*-value):(1) = (2)		0.60		0.44		0.81		0.26		0.66		0.90		1.00		0.73

Note: This table reports OLS regression on the operational changes of targets measured from the calendar year-end before bid announcement to the calendar year-end after bid failure. We examine four key aspects of operational changes: the target's total debt (*debt*), capital expenditure (*capex*), number of employees (*emp*) and research and development expenses (*rd*). The dependent variables are the targets' differences of operational measures scaled by total assets minus the scaled differences of operational measures of a control group matched by country, year, two-digit SIC codes and total assets. *Financial* (*Strategic*) equals one for bids initiated by financial (strategic) bidders and zero otherwise. *PE* equals one for bids initiated by private equity and zero for other bidders. *SizeQ*1 equals one if the target market capitalization is ranked in the lower quartile. Except for *Log(TargetSize)*, all other controls (*Cash*, *Premium*, *Hostile and TenderOffer*) and a constant are included in all regressions and defined in Table 3. Year dummies are based on the bid announcement year. Industry dummies are based on one-digit SIC codes. Columns 1–8 refer to the whole sample. Columns 9–16 include only bids to be paid fully in cash. Heteroskedasticity-robust *t*-statistics are in brackets.
***, ** and * indicate 1%, 5% and 10% significance, respectively.

This differential revaluation between financial and strategic bidders is consistent with the idea that the bidder type conveys information to the market about *ex-ante* mispricing and that beyond the information conveyed by the medium of payment. Furthermore, our evidence suggests that, while strategic bidders signal underpricing by using cash as a method of payment, financial bidders, precisely private equity, signal underpricing with their identity when target firms are small. In this sense, our findings suggest that private equity bidders act as a mechanism to correct underpricing when price deviations are most likely. This observation is particularly relevant as private equity acquirers are often criticized on the basis that they maximize investor returns at the expense of other stakeholders' welfare. All in all, our findings offer novel insights and contributions to different strands of the literature.

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