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The Value of Publicly Available Information on Acquired Firms in Corporate Acquisitions

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Past research shows that the outcomes of acquisitions of private firms are better than those of public firms. This finding is commonly explained by the price discount due to illiquidity and the higher information risk involved in acquiring private firms. Existing studies do not separate the two components. In this study, we do so by analyzing the outcomes of acquisitions of a hybrid group of firms that are privately owned yet subject to the same reporting and disclosure requirements of publicly traded firms. We find that the outcomes of acquisitions of such firms are superior to those of either public or private firms. Further, despite the measures used by acquirers to mitigate the higher information risk involved in acquiring private firms, they do not fully compensate for the added risk. These findings highlight the contribution to acquisition success of the availability of regulated financial reporting and disclosure on acquired firms.

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I. INTRODUCTION

Past research shows that the market response to acquisition announcements and the outcome of the acquisitions by public firms are more positive when the target is a private firm than when it is a publicly listed firm. This evidence led researchers to the conclusion that acquisitions of publicly traded targets are, at best, value-neutral, while those of privately held targets are value-enhancing.¹

These findings are commonly explained by the fact that the acquisition price of a private firm incorporates two discounts. One is due to the illiquidity of the shares of the private firm. The other discount reflects compensation required by the acquirer for the greater information asymmetry when the target firm is privately owned. Both factors contribute to what is known as the “private company discount”.

Various means exist by which acquiring firms can mitigate information asymmetry regarding the value of private targets, such as requiring audited financial statements, the inclusion of earnout provisions, the seller’s financing arrangements, or structuring the acquisition in the form of stock-for-stock exchange. However, while the existence of the private company discount and of superior outcomes for acquisitions of private firms may suggest that the acquirer is fully compensated for the inferior information available on private firms, to the best of our knowledge, there is no evidence that this is indeed the case.

We try to fill this gap by addressing the question of whether the price discount, along with other features of the deal used to mitigate information risk, adequately compensate for the greater information asymmetry involved in acquiring private targets. The reason that evidence is lacking

¹ See Roll 1986; Travlos 1987; Chang 1998; Fuller, Netter, and Stegemoller 2002; Moeller, Schlingemann, and Stulz 2004; Faccio, McConnell, and Stolin 2006; Capron and Shen 2007; Cooney, Moeller, and Stegemoller 2009; Officer, Poulsen, and Stegemoller 2009.

in the literature is likely because it would require the separation of the two contributors to the private company discount – liquidity and information asymmetry – a task that is difficult, if not impossible, because private firms usually have both traits: their ownership is illiquid, and they do not publicly disclose financial information.

We attempt to untie the knot and assess whether the features of the deal used to mitigate information risk, or any price discount due to that risk, adequately compensate for the greater information asymmetry involved in acquiring private firms. We do so by using a unique sample of acquisitions of quasi-private firms, that is, privately-owned firms — hence subject to a liquidity discount — that make their audited financial statements public. The first group of quasi-private firms consists of privately held firms that are considered statutorily public corporations by virtue of having issued public debt. As issuers of securities to the public these firms are bound by Sections 13 and 15(d) of the Securities Exchange Act of 1934, and thereby subject to the same financial reporting and disclosure regulations as firms with publicly traded equity (see Givoly, Hayn, and Katz 2010; Badertscher, Jorgensen, Katz, and Kinney 2014). A second group of quasi-private firms consists of privately held firms that filed historical financial statements in their S-1 filings for registration under Section 12(b) but withdrew their S-1 applications in the year-and-a-half window before the acquisition announcement dates. These are privately held firms whose shareholders pursued an IPO or a takeover but ended up selling their shares to other firms. Hence, at the time of the acquisition announcement, their equity ownership is private, but their past financial statements are publicly available.

Comparing the outcomes of acquiring quasi-private firms with those of acquiring public or private firms allows us to isolate the effect of information risk from that of liquidity on acquisition outcomes. Specifically, after controlling for other factors affecting acquisition outcomes, differences between the outcomes of acquisitions of quasi-private and public firms

should reflect only the liquidity discount, while differences in the outcomes of acquisitions of quasi-private firms versus (pure) private firms should reflect the information risk discount applied to the valuation of acquired private firms.

Accordingly, our predictions and tests are motivated by the following rationale: the acquisition of either private or quasi-private firms is subject to a liquidity discount, but the acquisition of private firms exposes the acquirer to greater information risk. If the outcomes of acquisitions of quasi-private firms (i.e., privately-owned firms with publicly available information) are superior to those of private firms, it would suggest that the price and the contractual terms of the acquisition designed to mitigate the information risk do not fully compensate the acquirer for the higher information risk involved in acquiring private firms.

We examine three acquisition outcomes. The first is abnormal returns for the acquirer's stock during the three-day period that includes the acquisition announcement date and the two days surrounding it (hereafter, the earnings announcement period). The other two are the post-acquisition performance of the acquirer as captured by (1) the difference in the acquirer's operating profitability between the pre- and post-acquisition periods, measured relative to the industry and based on the ratio of operating income after tax to net operating assets (RNOA), and (2) the subsequent absence or presence of impairment of the goodwill arising from the acquisition, or of a divestiture at a loss. We analyze a sample of 11,044 acquisitions made by public corporations over the 27 years from 1994 to 2020, of which 1,358 are of public firms, 9,460 of private firms, and 226 of quasi-private firms.

We start our analysis by replicating past studies that show that stock market reactions are more favorable to private than public firm acquisitions. We confirm this finding in our sample. Specifically, abnormal returns to the acquiring firm during the earnings announcement period are significantly greater – by 1.57% – for acquisitions of private firms than of public firms. However,

we do not find that either the post-acquisition abnormal RNOA nor the probability that the goodwill generated by the acquisition will subsequently be impaired significantly differ between private and public firm acquisitions.

Our main tests focus on comparing the outcomes of acquisitions of public, private, and quasi-private firms. After controlling for acquiring and acquired firm characteristics, as well as deal characteristics which may affect the outcome, we find that outcomes of acquiring quasi-private firms are more favorable than acquiring public firms, supporting the existence of a liquidity discount. Comparing the outcomes of acquiring quasi-private and private firms allows us to assess the effects on acquisition outcomes of the availability of financial statements for the quasi-private group. We find that both the stock market reaction to acquisition announcements and the post-acquisition profitability are significantly more positive for acquisitions of quasi-private firms than those of private firms. This suggests that the use of price discounts and deal characteristics to mitigate the higher information risk involved in acquiring private firms fails to fully compensate for the higher information risk associated with such acquisitions.

To alleviate potential endogeneity concerns, we replicate our main analyses using matched samples based on the entropy-balanced sample with similar distributions of the control variables. We also repeat the main analyses using a sample of acquisitions made by firms that have sequentially acquired different types of firms. This allows us to hold the acquirer's characteristics constant and attribute differences in acquisition outcomes to differences in the type of the acquired firm. Most of our main results and all our conclusions hold when we use any of these alternative approaches to address potential endogeneity.

In an additional analysis, we take advantage of the requirement of public acquirers of private firms to make public the financial statements of the acquired firm after completing a

significant acquisition.² Specifically, we test whether this ex-post disclosure on private targets results in the same degree of success as that of acquisitions of quasi-private firms for which financial information has been available for some time prior to the acquisition. Our results show that the presence of available financial information on the acquired firms in the period *preceding* the acquisition has an incremental effect on the success of the acquisition beyond the ex-post disclosure of the financial statements of the acquired firms *after* the acquisition. This further highlights the importance of the availability of the firms' financial information prior to the purchase for the success of the acquisition.

Our paper makes several contributions to the literature. First, it contributes to the literature that analyzes the factors affecting acquisition outcomes, notably research on the effect of the type of ownership of the acquired firm. Our findings also highlight the value of regulated and verified financial reporting and disclosure to investment decisions. Our tests consider acquisition outcomes that were not examined in previous studies, specifically the profitability of the acquired firm following the acquisition, and the potential impairment of goodwill associated with the acquisition or a subsequent loss from selling the acquired firm. By considering a multitude of acquisition outcomes, the inferences drawn regarding the effect of the type of the acquired firm on the acquisition's success are more reliable.

The rest of the paper is organized as follows. The next section presents a review of the literature relevant to our study. Section 3 details the empirical design. Section 4 describes the data and the sample. Section 5 presents and discusses the results, and the last section provides a summary and conclusions.

² Regulation S-X Rule 3-05 [b]. Chen (2019), described in the following section, tests the disciplinary effect of the ex-post disclosure of the financial statements of the acquired private firm on the acquirer's performance.

II. LITERATURE REVIEW

Multiple studies provide evidence that acquisitions of private firms are more successful than those of public firms. Travlos (1987) found that acquisition announcement returns were significantly negative on average when acquirers used stock to acquire publicly traded targets. Chang (1998) documented a negative abnormal return to announcements of bidders of public targets, but finds a positive announcement return for takeovers of privately held targets. Fuller et al. (2002) found positive abnormal announcement returns in a sample of repeat acquirers of private targets, as did Moeller et al. (2004) in a large relatively unrestricted sample, and Faccio et al. (2006) who examined non-US acquirers. In a similar vein, Capron and Shen (2007) showed that acquisitions of private targets elicited a more positive stock market reaction than their public counterparts.

The market response to an acquisition announcement may not perfectly predict the actual performance of the acquisition. Therefore, in comparing the outcomes of acquisitions of private, quasi-private and public firms we use an additional measure of the post-acquisition performance of the acquired business, represented by the difference in the acquirer operating profitability between the pre- and post-acquisition periods and the incidence of subsequent goodwill impairment or divestiture at a loss.

Under U.S. GAAP (SFAS 142), acquirers record, when appropriate a goodwill asset, i.e., the excess paid over the fair value of the net assets of the acquired firm. GAAP requires an annual review of the goodwill balance associated with the acquisition, as well as any impairment of that goodwill when its fair value falls below its book value. Goodwill impairment is thus considered an ex-post correction of overvaluation and overpayment in the earlier acquisition transaction. Goodwill impairment, divestiture at a loss, or both, have been used in numerous studies as a measure of acquisition performance (see, for example, Mitchell and Lehn 1990; Hayn and Hughes

2006; Francis, and Martin 2010; Gu and Lev 2011; Olante 2013; Kravet 2014; Chen, Collins, Kravet, and Mergenthaler 2017; Chen 2019).

As indicated in the introduction, various explanations have been offered for the superior performance of acquisitions of private firms compared with those of publicly traded firms, the main one being the discounted price of private targets due to both the illiquidity of private ownership (Shleifer and Vishny 1992) and the greater risk of information asymmetry involved when acquiring private firms, on which information is typically more limited than that available on publicly traded targets.³ Our study focuses on the role of publicly available information in reducing the information risk faced by acquirers of private firms. Various measures are used by acquirers to mitigate this risk, such as requiring private targets to produce audited financial statements (Minnis 2011; Jansen 2020) and the inclusion of earnout provisions or seller financing arrangements (Cadman, Carrizosa, and Faurel 2014; Jansen 2020). It has been further suggested that acquirers of private targets are compensated for the enhanced asymmetry of information due to fact that higher costs and efforts in obtaining information on the private target discourage other bidders, resulting in reduced competition and a deeper price discount for the target (Carpon and Shen 2007).

Our study extends the literature on the role of publicly available information on the quality of acquisition decisions by exploring whether the various measures that acquirers use to mitigate the information risk involved in buying a private firm do indeed compensate for the absence of publicly available information. Chen (2019), for example, examines the disciplinary role of ex-post information on the success of the acquisition, as captured by the acquirer's operating

³ The average (median) private company discount for domestic transactions, gauged by EBITDA multiples, are estimated at 28% (31%) (see Koeplin, Sarin, and Shapiro 2000).

performance, stock returns, and the incidence of goodwill impairment in the years following the acquisition.

The Securities and Exchange Commission (SEC) requires registrants to disclose audited financial statements of significant business acquisitions after the transaction is completed (Regulation S-X Rule 3-05). Although such information becomes available only with or after the acquisition decision, Chen (2019) hypothesized and found that this “ex-post” disclosure has a disciplinary effect on managers. Specifically, he found that the ex-post disclosure is associated with more favorable operating and stock performance of the acquirer in the 3-year period following the acquisition announcement, as well as lower goodwill impairments and divestitures. However, he found no significant effect of the ex-post disclosure on the announcement period return.

In additional tests, we extend Chen (2019) by testing whether the pre-acquisition availability of the history of regulated financial information for acquired firms that are public or quasi-private is superior to that of the ex-post disclosure required by the above SEC regulation for “significant” acquisitions. For this testing, we construct a separate sample of acquisition of private firms for which the acquirer provided the financial statements after the completion of the acquisition, in compliance with the regulation.

III. EMPIRICAL DESIGN

Main Tests

Our tests involve a comparison between the acquisition outcomes of three groups of acquired firms: public firms, private firms, and quasi-private firms. We use three key acquisition outcomes: the market ex-ante evaluation of the acquisition as reflected in its response to the acquisition announcement, the acquirer’s abnormal post-acquisition operating profitability, and the sustainability of the goodwill recorded by the acquirer.

The market response is captured by the abnormal return over the 3-trading-day period $t-1$, t , and $t+1$, where t is the acquisition announcement day. The abnormal return is computed as the excess return over the market return, defined as the CRSP value-weighted market return (Moeller et al. 2004; Officer et al. 2009; McNichols and Stubben 2015; Chen et al. 2018). Numerous prior studies have used short-window abnormal returns around an event to estimate the value implications of the event (Fama, Fisher, Jensen, and Roll 1969; Brown and Warner 1985). The merit of this approach is that the likelihood that abnormal returns are due to other concurrent events is lower than it would be if the event period were longer.

The initial market response to the acquisition announcement reflects investors' expectations based on the information available to them at the time of the announcement. However, the actual performance of the acquisition may differ from that expected by investors or by management (Ben-David, Bhattacharya, and Jacobsen 2020). We, therefore, consider two additional measures of the acquisition's success: one is abnormal operating performance of the acquiring firm after the acquisition; the other is any indication of the acquisition's failure, as captured by either goodwill impairment (observed within the five-year period following the acquisition) or divestitures at a loss (observed within the seven-year period following the acquisition).⁴

Our main inferences are drawn from the estimation of these three regressions:

$$CAR_{i,t} = \beta_1 Ownerhisp_Type_{i,t} + Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ABRNOA_{i,t} = \beta_1 Ownership_Type_{i,t} + Controls_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$GWIDLoss_{i,t} = \beta_1 Ownership_Type_{i,t} + Controls_{i,t} + \varepsilon_{i,t} \quad (3)$$

⁴ This information was hand collected from the filings. We used a longer post period for the occurrence of divestiture at a loss because, unlike goodwill impairment, divestiture takes longer to occur since it requires a third-party acquirer and often involves lengthy negotiations.

Ownership_Type, the variable of interest, is one of the following: private firm, public firm, or quasi-private firm. *CAR* is the cumulative abnormal return over the announcement period defined above. *ABRNOA* is the acquirer's abnormal post-acquisition RNOA⁵ in the three years after the acquisition. Following prior studies (Chen et al. 2007; Chen 2019; Ben-David et al. 2022), we control for the industry performance by regressing the post-acquisition industry-adjusted three-year average RNOA (t+1, t+2, and t+3) on the pre-acquisition corresponding profitability measure (t-3, t-2, and t-1) and a constant. The residual of the regression is the excess post-acquisition RNOA of the acquirer over its industry performance. *GWIDLoss* is an indicator variable that takes the value of 1 (occurrence of either goodwill impairment or divestiture at a loss) or 0 (non-occurrence). Regression (3) is thus a logistic regression.

We include year-fixed effects in each of the regression, even though the distribution of the three types of ownership over the years is similar in our sample.⁶ We use similar control variables in Regressions (1) to (3) because the factors determining the market expectations of the value-enhancing effect of an acquisition are likely to also affect the subsequent performance of the acquisition. In Regression (2) we replace acquiring firms' historical *MVE*, *MB*, and *LEV* financials with their average measures over the 3-years period after the acquisition to coincide with the time we measure the dependent variable *ABRNOA*.

To ensure robust estimation results, we employ specific criteria for Regressions (2) and (3). Firstly, we focus on transactions that are considered 'significant', where the transaction value represents at least 5% of the market value of the acquiring firm. This approach aligns with the notion that such acquisitions exert a meaningful impact on the performance of acquiring firms.

⁵ We use RNOA, computed as net operating profit after taxes (NOPAT) scaled by net operating assets, instead of ROA to eliminate the effects of the acquirer's capital structures on our measure of profitability.

⁶ We also include industry-fixed effects for Regression (2), where the dependent variable, *ABRNOA*, is constructed based on three-digit SIC codes, and find similar results.

Additionally, we require that the acquiring firms have complete Compustat information for the five years following the completion of the deal. This criterion ensures data reliability and enables comprehensive analysis of the post-acquisition period. Furthermore, in the case of Regression (3), we specifically consider transactions completed after 2003. This was motivated by the introduction of a new business combination accounting standard (SFAS 142) that mandated reporting of goodwill impairment as of December 15, 2001.⁷

Explanatory and Control Variables

Deal Characteristics

As control variables in Regressions (1) to (3), we use deal-specific characteristics and some of the characteristics of acquiring and acquired firms suggested in prior research to explain acquiring firms' stock market returns around the announcement date (Moeller et al. 2004; Raman, Shivakumar, and Tamayo 2013; McNichols and Stubben 2015; Chen 2019). Deal-specific characteristics are the proportion of stock payment (*STOCK*), whether the deal was negotiated (i.e., friendly) between the acquirer and target (*NEGOTIATED*), whether the deal was a competing bid (*COMPETING*), and whether the deal included an earnout (*EARNOUT*). Another deal characteristic that we include in all regressions is the percentage of goodwill of the total acquisition cost (*%GW*). We expect acquisitions where the main asset acquired is goodwill to be riskier and more susceptible to future losses/impairment (see Hayn and Hughes 2006). Investors may also be concerned about a high proportion of goodwill in the acquisition price and reflect this concern in their response to the announcement.

Another deal characteristic that we include is the relative size of the deal, *RELATIVE_SIZE*, defined as the ratio of the value of the acquisition to the market value of the

⁷ Following Ben-David et al. (2022), we exclude the year 2002 from our analysis due to its nature as a transitional year for the implementation of the new standard.

acquirer's equity. In Regression (1), we expect the absolute magnitude of *CAR* (regardless of its sign) to be strongly associated with the relative size of the acquisition, the rationale being that an acquisition of a given dollar value will have a smaller (larger) impact on the return of a larger (smaller) acquiring firm. To capture this association for both positive and negative *CAR*, we specify this control variable as *RELATIVE_SIZE* x (the opposite sign of *CAR*). We expect the sign of this variable's coefficient to be negative.

When the dependent variable is *GWIDLoss* in Regression (3), the presence in the regression of *RELATIVE_SIZE* (without the adjustment for the sign of *CAR*) addresses the possibility that adverse outcomes represented by *GWIDLoss* of relatively small acquisitions may not be reported because the amounts involved are immaterial. If such cases are common, *RELATIVE_SIZE* will be positively associated with these two outcomes.⁸

Acquirer's Characteristics

Acquiring firm-specific characteristics included in the regressions are firm size (*ACQ_MVE*), leverage (*ACQ_LEV*), and profitability (*ACQ_ROA*). We also include the market-to-book ratio (*ACQ_MB*). Lang, Stulz, and Walkling (1989) show that *CAR* is higher when the market-to-book ratio for the acquiring firms is higher, interpreting a higher market-to-book ratio as indicative of the higher quality of the acquiring firm's current and future investment opportunities.

Other variables

In the main regressions, we use another explanatory variable which is an indicator of the stock market condition at the time of the acquisition (*MKCOND*). Prices for targets are expected

⁸ Prior studies based on publicly traded targets include other deal characteristics like poison pills and tender offers (e.g., Raman et al. 2013; McNichols and Stubben 2015). However, those measures are rarely used for the acquisition of privately held targets and their inclusion does not affect our results.

to be higher in a bull market than a bear market, and management is likely to be more optimistic in a bull market. Given this upbeat sentiment, acquisitions in bull markets are more likely to reflect overpayment than those in bear markets, hence more likely to end with goodwill impairment or divestiture at a loss. There are numerous ways to define a bull market, the most common being a long period of uninterrupted increases in stock prices. In this spirit, we developed an algorithm to identify bull markets (see Appendix A for all variable definitions and Appendix B for the algorithm to identify the bull markets).

The Effect of the Public Availability of Financial Statements of the Acquired Firm Before versus After the Acquisition

Chen (2019) found that the ex-post disclosure of financial statements of the acquired firm in a significant acquisition, as required by the SEC, had a positive effect on the acquisition outcome. We extend this work by testing whether the information advantage in acquiring quasi-private (rather than private) firms that comes from regular and timely financial disclosures is retained with the ex-post disclosure of financial statements of acquired private firms.

The requirement for ex-post disclosure applies only to large acquisitions that meet one of several size thresholds, one being the ratio of the price paid for the acquired firm to the acquirer's total assets of 20% or higher. We therefore include only a subset of acquisitions of private firms that meet this threshold and are thus required to disclose financial statements ex-post.⁹ As in the main tests, our intention is to capture the incremental information advantage in the form of more favorable acquisition outcomes.

⁹ We hand-collected data to ascertain that the acquirers of private firms meeting this size threshold indeed provide financial statements. We found that the financial statements of 83.78% of the acquisitions that met the threshold were provided in acquiring firms' financial statements after deal completion.

IV. DATA AND SAMPLE

Our sample period covers the 27 years from 1994¹⁰ to 2020. We construct a sample of acquisitions using the Securities Data Company (SDC)'s U.S. mergers and acquisitions database. We follow prior studies' sample criteria (e.g., Moeller et al. 2004; Officer et al. 2009; McNichols and Stubben 2015). We first select the sample of domestic mergers and acquisitions by U.S. firms listed either on the NYSE, AMEX, or NASDAQ. We obtain information from the SDC database about the sample target firms' ownership and select both publicly and privately held targets. We exclude transactions if either acquiring or acquired firms are in financial industries (SIC code 6000-6999) or regulated industries (SIC code 4000-4999). We restrict our sample to transactions where acquiring firms did not own more than 50% of acquired firms' shares before the transaction. We exclude transactions whose deal value disclosed by the SDC was less than \$1 million, and only consider transactions completed within 1,000 days of the date of the announcement.

We combine the SDC sample with Compustat and CRSP data and require acquiring firms to have the following information for the year of the transaction: total assets, total liabilities, stockholders' equity, market value of equity, net income, and the central index key (CIK) of the SEC's Electronic Data Gathering, Analysis, and Retrieval system (EDGAR). We exclude transactions where targets with publicly available financial information do not have five years of Compustat information (total assets, net income, and operating cash flows) immediately prior to the acquisition date. For S-1 filers that withdrew from the IPO, we require only three years of financial information. We use EDGAR to search for disclosures of acquired firms' financial statements after completion of deals. We manually collect goodwill impairment data relating to individual acquisitions from acquiring firms' financial statements filed in EDGAR. We identify

¹⁰ We start our sample in 1994 since EDGAR, which we rely on to identify quasi-private firms and to collect post-acquisition goodwill impairments or divestiture-at-a-loss information, started in 1994.

divestitures based on data on divested segments from the SDC's U.S. mergers and acquisitions database. We associate a divestiture with an acquisition only if the acquired firm has the same 3-digit SIC code as the divested segment (Francis and Martin 2010; Chen 2019). We identify the ownership type of acquired firms using the procedure used by Katz (2009) and Givoly, Hayn, and Katz (2010), as described in Appendix C. Table 1 shows the sample construction. Our final sample consists of 11,044 acquisitions, of which 1,358, 9,460, and 226 acquisitions are of a public, private, and quasi-private firm, respectively.

V. RESULTS

Descriptive Statistics

Table 2 exhibits distribution statistics on the variables participating in the main regression for firms of each type of ownership. The outcomes of the acquisitions differ: acquisitions of quasi-private firms have the most positive outcomes, while those of public firms have the worst outcomes. The mean *CAR* is 1.5%, 4.8%, and -1.0% respectively for acquisition of private, quasi-private, and public firms. The mean *CAR* is significantly higher for quasi-private firm acquisitions than private firm acquisitions (t-value is -1.67*) or public firm acquisitions (t-value is 2.97***). The mean of *ABRNOA* also differs across the three types of groups, -0.41%, 1.97%, and 1.45%, respectively. *ABRNOA* is significantly higher for quasi-private than private firm acquisitions (t-value is 1.91*), whereas it is not significantly different between quasi-private and public firm acquisitions. The mean values of the relative frequencies of goodwill impairment or divestiture at a loss (*GWIDLoss*) are respectively 11.7%, 10.8%, and 16.1%. Pair-wise univariate tests suggest that the frequency of *GWIDLoss* is significantly different only between private and public firm acquisitions.

As expected, acquisitions of private firms, which are smaller on average than those of public firms, tend to be made by smaller acquirers. The mean and median market value of equity *ACQ_MVE* of acquirers of private firms (\$6,493 and \$592 million) are considerably smaller than those of acquirers of public firms (with mean and median *ACQ_MVE* of respectively \$20,970 and \$2,599 million).

Another notable difference between the acquisitions of firms in the three groups is in the relative frequency of earnout provisions (*EARNOUT*). These are much more common in acquisitions of private firms, representing 11% of these acquisitions compared with 7% and 1% of acquisitions of quasi-private and public firms respectively. The high rate of occurrence of an earnout provision in acquisitions of private firms is likely a reflection of the greater information risk associated with acquiring this type of firm.

We also note that another feature of acquisition transactions designed to reduce information risk – the acquirer’s use of its stock as part of the tender offer (*STOCK*) – is used more frequently in acquisitions of public firms than of private firms (39% vs. 18%). The greater propensity of public acquirers to offer their stock to when acquiring another public firm may be an attempt to provide greater assurance to the acquirer (as well as the acquired public firm) against mispricing due to the availability of independent market-tested values of the exchanged stocks.

Panel B of Table 2 presents the correlation matrix between the regression variables. While most correlations are significant, they are generally very small (90% of the coefficients $\leq |0.05|$). Correlations among the three outcome variables are mostly insignificant, suggesting that they capture different aspects of the value implications of acquisitions. The negative correlation between *ABRNOA* and *GWIDLoss* is to be expected, since the two post-acquisition performance measures indicate opposing outcomes.

Among the deal characteristic variables, *RELATIVE_SIZE*, is the most influential (the Parson coefficients of it with *CAR*, *GWIDLoss*, and *ABRNOA* are 0.25***, 0.05**, -0.04**, respectively). The positive correlation between *Relative_Size* and *GWIDLoss* suggests that under-reporting of goodwill impairments is associated with relatively small acquisitions. This is consistent with management considering the relative materiality of the goodwill impairment charge in deciding whether to disclose it. This consideration may remove from our sample impairments whose size is considered immaterial for separate disclosure. We comment on this possibility when we discuss the results in the next section.

Main Results

The main results from our comparisons of the effect of the ownership type of the acquired firm on the success of the acquisition are presented in Tables 3, 4, and 5. These show the findings from estimating Regressions (1) to (3) respectively.

Table 3 shows the results from estimating Regression (1), in which the measure of the acquisition's success is based on evaluation by the stock market, as captured by abnormal returns in response to the acquisition announcement (*CAR*). The results in column (1) of Table 3 confirm the findings documented in the literature, namely that the market response to acquisition announcements is more favorable for private firm acquisitions than public firm acquisitions. *CAR* is higher on average by 1.6% when the acquired firm is private rather than public (see the coefficient on *Private* in column (1) of Table 3). This difference is significant at the two-sided 1% level.

Further comparisons of the market response to the acquisition of quasi-private firms with those of public and private firms are shown in columns (2), (3), and (4). The variable of interest is *Quasi-private*, which conveys in this regression incremental abnormal returns in the days around the announcement of an acquisition of a quasi-private firm relative to those of firms in other

ownership groups. Column (2) shows that, after controlling for an array of variables, the market response is more favorable to acquisitions of both private firms (by 1.4%) and quasi-private firms (by 4.2%) than those of public firms.

Differences in outcomes between acquisitions of quasi-private firms and those of private or public firms provide insights into the role of publicly available information or illiquidity in the success of acquisitions. The so-called ‘private company discount’ is attributed to two characteristics of private firms, namely the illiquidity of their privately held equity and the absence of publicly available financial information. Breaking the group of private firms into groups, one consisting of ‘pure’ private firms and the other of quasi-private firms, allows us to address two important questions – one about the respective contribution of each characteristic to the private company discount, the other about whether the measures taken by acquirer to mitigate the additional information risk associated with acquiring a private firm (such as by structuring the acquisition as an exchange of stock, introducing earnouts into the purchase agreement, or by a further price discount) are sufficient. In other words, the mitigating measures are a substitute for the availability of public information.

The answers to these questions are provided in columns (3) and (4) of Table 3. Column (3) shows the difference between the market response to acquisitions of quasi-private firms that are privately-owned and to acquisitions of public firms. Both groups report the same set of financial statements and other mandatory disclosures. The difference between them is that the equity of quasi-private firms is not traded and therefore illiquid, and hence reflects the effect of the premium enjoyed by the public acquiring firm due to the liquidity discount. The results in column (3) show a higher *CAR* by 1.7% points for acquisitions of quasi-private firms than for public firms. This result, which is significant, suggests a meaningful effect of the liquidity discount

extracted by the public acquirer of quasi-private targets on market expectations of the success of the acquisition.

Column (4) of Table 3 presents the difference between the market response to acquisitions of quasi-private firms and private firms. Neither group's equity is traded and therefore illiquid. The difference between the two groups is in the amount of available information on the firm. While private firms in the U.S. are not required to report their financial statements, quasi-private firms are subject to the same reporting and disclosure requirements as firms whose equity is publicly traded. Therefore, the difference between the market's response to acquisitions of quasi-private firms should reflect the richer information environment in which they operate, including the availability of financial statements, credit analysts' reports, and media coverage.

The results in column (4) show that the *CAR* associated with acquisitions of quasi-private firms is higher by 2.9% than that associated with acquisitions of private firms, a difference that is significant at the two-sided 10% significance level. This finding – that the availability of public information on acquired firms has an important positive effect on market expectations of an acquisition's success – can be expected. Acquirers of private firms naturally take steps to mitigate the higher information risk involved in buying a private firm, such as earnout provisions, structuring the deal as an exchange of stock, and (as additional protection from the higher risk) some form of price discount. Therefore, the finding that the *CAR* following the acquisition announcement of quasi-private firms is significantly higher suggests that all these measures, including price discounts, are still not viewed by investors as sufficient to offset the perceived higher information risk involved in the acquisition of private firms. It should be noted that all the differences between the *CAR* of the acquisitions of the three groups of firms are not only significant, but economically important given that the mean *CAR* in the sample is 1.54%.

A glance at the coefficients of the control variables in Regression (1), shown in Table 3, reveals that those with the most consistent significance coefficients across the different comparisons are (*RELATIVE_SIZE*) \times (*- Sign of CAR*), *STOCK*, *MKCOND*, *ACQ_MVE*, *ACQ_MB*, and *ACQ_LEV*. The signs of these coefficients are consistent with expectations. Most other control variables (which were used by past studies) show no or inconsistent significance across the comparisons.

Table 4 presents the results of post-acquisition profitability (*ABRNOA*) from estimating Regression (2). Column (3) shows the differential operating performance between acquisitions of quasi-private and public firms. Note that both types of firms operate in a rich information environment. Yet, they differ in that the equity of public firms is liquid while that of quasi-private firms is not, which gives rise to a liquidity discount granted to publicly traded acquiring firms. The coefficient on *Quasi-private* in column (3) is positive and significant at the two-sided 10% level, suggesting that acquirers' operating profitability in the post-acquisition period is greater (by 1.6%) when the acquired firms are quasi-private rather than public. This means that the liquidity discount may be too low because acquirers of the less liquid quasi-private firms enjoyed ex-ante the liquidity discount and further benefitted from higher operating profitability of their investments after the acquisition.

The results of the comparison between the post-acquisition operating profitability of the acquirers of quasi-private firms and private firms are presented in column (4) of Table 4. Note that while these two types of firms have illiquid equity, quasi-private firms operate in a much richer information environment. The coefficient on *Quasi-private* is positive and significant at the two-sided 5% level (coefficient 1.941), that is, the acquisition of quasi-private firms is associated with 1.9% higher operating profitability in the post-acquisition period than acquisitions of private firms. This is consistent with a richer information environment in the form of disclosure of financial

statements on the acquired firm, contributes to the success of the acquisition by facilitating deal screening and post-acquisition integration. Interestingly, the finding is also consistent with the notion that protection from asymmetric information obtained by acquirers of private firms prior to the acquisition (in the form of a price discount, as well as other contractual arrangements designed to mitigate information risk) may be insufficient to overcome the consequences of having inferior information on private firms.

Finally, Table 5 provides the results from Regression (3), a logistic regression in which the dependent variable *GWIDLoss* is an indicator variable for the occurrence of either of two events subsequent to the acquisition that suggest at least a partial failure. One is a subsequent impairment of the goodwill balance created at the time of the acquisition; the other is a subsequent divestiture of the acquisition at a loss. Because Regression (3) is a logistic regression, the variable coefficients in Table 5 are (for ease of interpretation) the marginal effects on the dependent variable. In our case, this means that the coefficient of an independent variable represents the effect of a deviation of one unit of that variable from the mean on the expected probability of either of these two unfavorable outcomes occurring (that is, the probability of $GWIDLoss = 1$), assuming the value of all other independent variables is their respective mean.

As in Table 4, the variable of interest in columns (3) and (4) of Table 5 is *Quasi-private*. The direct comparison between the outcomes of acquisitions of quasi-private firms with those of public firms is shown in column (3). Note that the comparison is between two groups of firms that operate in a similar information environment but differ in that the ownership of public firms is traded and therefore liquid, whereas the ownership of quasi-private firms is illiquid. The coefficient on *Quasi-private* is -0.061, indicating that the incidence of an unfavorable outcome of the acquisition indicated by the dependent variable is lower by 6.1% for quasi-private firm acquisitions than public firm acquisitions. This negative coefficient is not only significant at the

two-sided 5% level but is economically meaningful given that the incidence in the full sample of goodwill impairment or divestiture is about 12%. The more favorable outcomes of quasi-private acquisitions (as reflected in the coefficient of -0.061 on *Quasi-private*) reflect the discounted price paid for them due to the illiquidity of their equity.

The last comparison, between quasi-private and private firms, is shown in column (4) of Table 5. The coefficient on *Quasi-private* is negative (-0.001), it is insignificant. The finding of insignificant difference in the likelihood of *GWIDLoss* between quasi-private firms and private firms may be due to the absence of separate disclosure in the financial statements of the presence and amount of goodwill impairment or loss from divestiture when the amounts involved are immaterial. Note that there is a positive and significant correlation coefficient between *Relative_Size* and *GWIDLoss* (see Panel B of Table 2). This is consistent with a lack of disclosure of the amount of goodwill impairment that relates to small acquisitions, which can reasonably be explained by materiality considerations. That is, when the relative size of the acquisition is very small, firms are less likely to disclose separately the goodwill write-off (or loss from divestiture). The result of this under-disclosure is that our sample of impairments (which was collected manually from the 10-Ks) is truncated and biased due to unobservable goodwill impairments for small acquisitions.

Acquisition size varies across the three types of firms. In particular, the relative size of acquisitions of quasi-private firms is much greater than those of private firms. The mean and median of *RELATIVE_SIZE* (the fraction of the deal size of the market value of the acquirer) are respectively 0.594 and 0.144 for quasi-private, and only 0.209 and 0.061 for private firms. Therefore, when impairments occur, they are more likely to be disclosed when the acquisitions are of quasi-private firms than of private firms. This suggests that investors' expectations (as captured by *CAR*) that acquisitions of quasi-private firms will be more successful than those of private firms

do not materialize, at least not when performance is measured in terms of the lower likelihood of these two unfavorable events. The inconsistent results of the two analyses based on *ABRNOA* and *GWIDLoss* suggest that the upside of acquisitions, rather than the downside measured by *GWIDLoss*, may differ according to the existence of the acquired firms' financial statements.

In sum, the results presented in Tables 3, 4, and 5 show that in terms of two of the three acquisition outcomes considered in our study, namely *CAR* and *ABRNOA*, acquisitions are more favorable when firms acquire private firms with publicly available historical financial statements, thus underlining the economic value of financial information.

Results for the Incremental Effect of Timely versus Ex-Post Financial Information on Acquisition Outcomes

The results reported in Tables 3 and 4 show that the *CAR* and *ABRNOA* outcomes of acquisitions of quasi-private firms are significantly better than those of private firms due primarily to the public availability of their financial statements and related disclosures. We compare outcomes of acquisition of quasi-private firms whose financial statements are publicly available *prior* to their acquisition with those of significant acquisitions of private firms whose financial statements are disclosed *after* the acquisition is completed.¹¹ As discussed in Section 2, Chen (2019) finds that ex-post disclosure has a disciplinary effect on management and the acquisition decision, and therefore results in a more favorable outcome following the acquisition. However, he reports no significant market reaction effect around the acquisition announcement.

The purpose of the current test is to determine whether the outcomes of acquisitions of quasi-private firms are still superior to those of private firms whose financial statements are disclosed post-acquisition (for which the ratio of the acquisition price to the total assets of the

¹¹ As required by the SEC when an acquisition exceeds a defined significance level (see Regulation S-X, Rule 3-05(b)).

acquirer equals or exceeds 20%). The outcomes in this subsample are compared to those of a subsample of acquisitions of quasi-private firms which all made disclosures *before* the acquisition. The results, reported in Table 6,¹² show that the acquisition outcomes of quasi-private firms for which financial information is publicly available beforehand are more favorable in terms of the stock market's response to the acquisition announcement (*CAR*) and in terms of operating performance (*ABRNOA*) than to acquisitions of private firms for which financial statements are available only after the acquisition is completed. Specifically, the coefficient on *Quasi-private* in column (1) is positive and significant at the two-sided 10% level, indicating that the *CAR* associated with acquisitions of quasi-private firms is greater by 2.4% than that of private firms for which financial information was disclosed only after the completion of the acquisition.

The coefficient on *Quasi-private* in column (2) is also positive and significant at the two-sided 1% level, indicating that acquirers' operating profitability (*ABRNOA*) in the post-acquisition period is significantly greater (by 2.9%) when the acquired firms are quasi-private and disclose financial information *ex-ante*, as compared to private firms making a significant acquisition that disclose the target firms' financial information only *ex-post*.

The last comparison, of the likelihood of goodwill impairment and divestitures between quasi-private and private firms with *ex-post* disclosure, is reported in column (3) of Table 6. While the coefficient on quasi-private firms is negative (-0.003), it is insignificant. As noted above, the insignificant coefficient may be due to the absence of separate disclosure in the financial statements of the existence and amount of goodwill impairment, or loss from divestiture when the amounts involved are immaterial. Our conclusion from examining the value of *ex-post* disclosure of financial statements is that while they improve acquisition outcomes due its disciplinary effect

¹² To make the results comparable with those reported by Chen (2019), we report statistical statistics based on heteroskedasticity-robust standard errors.

(Chen 2019), it is no substitute for a steady flow of timely financial statements in improving the outcome of the acquisition.

Robustness Tests

To alleviate potential endogeneity issues, we repeat our main analysis using (1) a covariate-balanced sample based on an entropy reweighting scheme (EB) and (2) a sample of acquisitions made by firms acquiring different types of targets. Our main results hold, as presented in Table 7.¹³

Our motivation for the robustness tests is as follows. One concern is that the choice of acquired firm types is not random. A nonrandom assignment could be an issue, particularly if high-quality acquiring firms (i.e., those that have better acquisition outcomes) tend to select specific types of acquired firms. In this case, running a regression without controlling for this selection effect would result in biased and inefficient estimates of the effects of acquired firm types. To address this issue, we construct a balanced sample based on entropy weighting such that the covariate distributions of the different types of target acquisitions are similar (Panel A). The virtue of this approach is that differences between the covariate distributions of different target types become insignificant, and the estimated coefficients are closer to being independent of those covariates. We specify the balancing condition based on our control variables to get EB weights, and then re-estimate Regressions (1), (2), and (3) with the weights.

Finally, we repeat our main analysis using acquisitions by firms that made multiple acquisitions of firms with a different ownership type (Panel B). This sample enables us to hold acquiring firms' characteristics constant, and therefore attribute differences in acquisition outcomes to differences in target firm types. Note, however, that we lose many observations for

¹³ We also conduct analysis based on the industry-size matched sample and propensity score matched sample. The results are qualitatively similar to the main tests as well as those based on the entropy reweighting approach.

the tests on abnormal post-acquisition profitability (*ABRNOA*) and the impairment or divestiture at a loss (*GWIDLoss*). Therefore, we conduct for this robustness test only the analyses of the acquisition announcement return (*CAR*).

Most of our main results and all our conclusions hold when we use these alternative approaches to address potential endogeneity.

VI. SUMMARY AND CONCLUDING REMARKS

Acquiring privately held firms enables acquirers to benefit from liquidity and information risk discounts extracted from the owners of private firms. The information risk arises from the information asymmetry between the acquirer and the private firm due to the lack of public information. To compensate them for the information risk, acquirers of private firms, in addition to offering a lower price, also introduce to the purchase agreement contractual features such as stock payments or earnouts. Previous studies do not separate the two components of the discount in the acquisition of private target firms, nor do they examine whether the price discount for the higher information risk in acquiring a private target firm fully compensates for the elevated risk. Our study analyzes the outcomes of acquisitions of three types of target firms: private firms, public firms, and quasi-private firms, i.e., privately-owned firms that are subject to financial reporting obligations. This research design allows us to better isolate the illiquidity discount effect by comparing quasi-private and public firm acquisitions, and the information asymmetry effect by comparing quasi-private and private firm acquisitions.

We find that, after controlling for other factors affecting acquisition outcomes, the outcomes of acquisitions, both *ex-ante* in terms of the market response to the acquisition announcement, and *ex-post* in terms of future operating profitability, are significantly more favorable for the acquisition of quasi-private firms than for acquisitions of both public and private

firms. Further, despite all the measures employed by acquirers to mitigate the higher information risk involved in acquiring private firms, including potential price discounts, they do not fully compensate for this added risk. These findings highlight the contribution to acquisition outcomes of the availability, prior to the acquisition, of the history of regulated financial reporting disclosure by the acquired firms.

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Appendix A: Variable Definitions

Independent variables

<i>Private</i>	An indicator variable equal to one when the acquisition is of a privately held firm without any historical financial statements within the last three years before the acquisition announcement date. Financial and stock price information is unavailable in the SDC, and there is no matched gvkey or permco in the CCM database.
<i>Quasi-private</i>	An indicator variable equal to one when the acquisition is of a privately held firm (1) that is statutorily considered public by the virtue of having issued debt to the public or (2) that filed but withdrew S-1 registrations within 1.5 years prior to the acquisition announcement date. Information about their equity status is identified from Item 5 (“Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities”), which describes firms’ equity securities, in 10-Ks.

Dependent variables

<i>CAR</i>	Acquiring firm’s cumulative abnormal return (CAR) measured over the three trading days centered on the M&A announcement date. Abnormal returns are measured from the market model using the CRSP value-weighted return as the market return. The estimation window of the market model parameters is days (–200, –60) prior to the acquisition announcement date (Chen, Harford, and Li, 2007; McNichols and Stubben, 2015).
<i>GWI</i>	An indicator variable equal to one when the acquiring firm recognizes impairment of goodwill or a loss of divestiture arising from the acquired firm within five years after the the completion of the acquisition. Information about goodwill impairments is manually collected from acquiring firms’ financial statements.
<i>DLoss</i>	An indicator variable equal to one when the acquiring firm makes a divesture within seven years after the acquisition is completed and if the acquired firm has the same three-digit SIC code as the divested segment (Francis and Martin 2010; Chen 2019).
<i>GWIDLoss</i>	An indicator variable equal to one if either GWI or DLoss are equal to one.
<i>ABRNOA</i>	The difference in the ratio RNOA (return on net operating assets) of the acquirer, relative to its industry, between the post- acquisition period and the pre-acquisition period. RNOA is calculated as the net operating income (NOPAT, Compustat item oiadp) after tax, deflated by the average of the beginning and ending balance of net operating assets, NOA defined as the difference between is net operating assets (Compustat items at minus che) and net operating liabilities (Compustat items lt minus debt). The tax rate applied to NOPAT is 0.3. ABRNOA is computed as residuals from the following regression model that relates the acquiring firm’s RNOA relative to its industry in the post-acquisition to its RNOA relative to its industry in the pre-acquisition profitability (Chen et al. 2007; Ben-David et al. 2022):

$$\frac{1}{3} \sum_{t=1}^3 (RNOA_{i,t} - RNOA_{industry,t}) = a + b \frac{1}{3} \sum_{t=-3}^{-1} (RNOA_{i,t} - RNOA_{industry,t}) + e_{i,t}$$

Control variables+

<i>RELATIVE_SIZE</i>	The relative size of a deal is defined as the value of the transaction (SDC) divided by acquiring firms’ market value of equity measured at the most recent fiscal quarter end prior to the deal announcement dates (Compustat prcc_f*csho).
<i>%GW</i>	The proportion of goodwill (out of the value of the transaction (SDC)). The amount of goodwill is estimated based on annual changes in acquiring firms’ goodwill (Compustat item gdw). If there are multiple deals in a year, the annual changes are distributed proportionally to the transaction values.
<i>STOCK</i>	The ratio of the value paid by the acquiring firm in the form of its stock divided by the total transaction value. Information about deal characteristics is from SDC (Officer et al. 2009).
<i>EARNOUT</i>	An indicator variable equal to one when the deal includes an earnout provision. Information about deal characteristics is from SDC (Raman et al. 2013; McNichols and Stubben, 2015).
<i>COMPETING</i>	An indicator variable equal to one when there are additional (i.e., competing) bids for the target. Information about deal characteristics is from SDC.
<i>NEGOTIATED</i>	An indicator variable equal to one when the transaction is negotiated (i.e., friendly). Information about deal characteristics is from SDC (Raman et al. 2013; McNichols and Stubben, 2015).
<i>MKCOND</i>	An indicator for bull market periods, include [2002-10-09 to 2007-10-09] and [2009-03-09 to 2019-12-31]. Refer to Appendix B about the algorithm to identify bull market periods.

<i>ACQ_MVE</i>	The acquiring firm's market value of equity one quarter prior to the M&A announcement. The firms' market value of equity is calculated as the multiplication of share price (CRSP item prc) and the number of shares (CRSP item csho).
<i>ACQ_ROA</i>	Acquiring firm's ROA, defined as the firm's income before extraordinary items (Compustat item ib) multiplied by (1-0.35), divided by the average of total assets (Compustat item at). The ratio is measured for the latest fiscal year end before the M&A announcement.
<i>ACQ_MB</i>	Acquiring firm's market-to-book ratio, defined as the firm's market value divided by its book value (Compustat item at). The firm's market value is proxied by the sum of the book value of firm's long and short-term debts (Compustat items dlcc plus dlt) and the market value of equity (Compustat items prcc_f multiplied by chos). The ratio is measured at the latest fiscal year end before the M&A announcement.
<i>ACQ_LEV</i>	Acquiring firm's leverage, defined as the sum of long and short-term debts divided (Compustat items dlcc plus dlt) by total assets (Compustat item at) at the latest fiscal year end before the M&A announcement.
<i>ACQ_POST_MVE</i>	The acquiring firms' three-year average annual market value of equity measured starting 180 days after the M&A completion.
<i>ACQ_POST_MB</i>	The acquiring firms' three-year average annual market-to-book ratio measured starting 180 days after the M&A completion.
<i>ACQ_POST_LEV</i>	The acquiring firms' three-year average annual leverage measured starting 180 days after the M&A completion.

Appendix B: Identification of Bull Markets and the Definition of MKCOND

A bull market is defined as an extensive period over which equity prices rise (Bry and Boschan 1971; Pagan and Sossounov 2003). During this period, economic activities are expanded, and market participants tend to be optimistic and confident about general economic conditions. Identifying bull market periods requires defining the locations of the local trough (or bottom) and peak points of equity prices and the duration between the two points (Pagan and Sossounov 2003). Since a standard definition of a bull market is lacking, academic literature and practitioners use their own definitions. First, the business cycle and econometrics literature have developed pattern recognition algorithms to identify business cycles and bull and bear markets (Bry and Boschan 1971; Pagan and Sossounov 2003). Second, the finance literature examining differential equity premium by business cycles uses a heuristic approach for pattern recognition (Fabozzi and Francis 1979; Bhardwaj and Brooks 1993). Third, financial or business presses define bull markets as the rise of equity prices greater than 20% or 25% for specific periods such as six months. However, this method does not make sense because one can go back a sufficiently long period to find a cumulative return of 20%. Accordingly, we developed our own pattern recognition algorithm to identify bull markets. The algorithm follows these steps:

- Step 1. We define potential turnaround dates as the local minimums and maximums of the S&P 500 index in our sample periods (both dotted and solid lines in the below pictures).
- Step 2. When one local maximum is followed by another local maximum, we choose the greater value as the local maximum. Likewise, when another local minimum follows one local minimum, we choose the smaller value as the local minimum. We iterate this procedure until one local maximum is never followed by another local maximum so that local maximums and minimums alternate.
- Step 3. We require that the index changes between one local maximum to the local maximum are greater than 20%. We view index changes between 10-20% as price adjustments rather than general market trends. After this step, if another local maximum follows one local maximum or another local minimum follows one local minimum, we iterate Step 2.

As a result, we get the two bull market periods: [2002-10-09 to 2007-10-09] and [2009-03-09 to 2019-12-31].

Figure A1. The trend of the S&P 500 index and the market condition classification



Appendix C: The Procedure to Identify the Firm's Ownership Type

We first match the SDC's M&A data with Compustat and CRSP. We use the SDC-Compustat matching files provided by Phillips and Zhdanov (2013) and Ewens, Peters, and Sean (2018). For the unmatched sample firms, we find gvkey based on the historical six digits of CUSIP, ticker, and firm name provided by the Compustat security file. We define acquired firms with matched gkvey and common share price in CRSP (matched based on permco in the CRSP/Compustat Merged (CCM) Database) over the three years prior to the acquisition announcement dates as 'public' firms. Out of the remaining firms, we then manually check the historical security registration status for 6,013 selected sample firms (54.45% of the total of 11,044). We assume that acquired firms are (purely) private if any of their primary financial information or stock market and price information is unavailable. Specifically, we check whether their financial information including total assets, revenues, net incomes, EBITDA, or debts is available in the SDC database. We also check their stock market and price information in the SDC database. In addition, we review the Mergent Fixed Income Securities Database (FISD), which covers publicly offered U.S. bonds, to identify firms that have issued public debts before the acquisition announcement dates. Consequently, we have 6,013 cases of potential quasi-private firm acquisitions.

For these cases, we check acquired firms' last available filings before the acquisition announcements in the SEC EDGAR. Following Katz (2009) and Givoly, Hayn, and Katz (2010), we check Item 5 ("Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities"), which describes firms' equity securities, in their 10-Ks. We find that 145 sample firms filed their 10-Ks, 10-Qs, and other required filings under Section 12(b) of the Securities Exchange Act of 1934 (Exchange Act 1934) since they had issued publicly traded debts despite their equity being privately held. We also find another 81 firms with historical financial statements that filed their historical financial statements in their S-1 filings for registration under Section 12(b) but withdrew their S-1 applications within the year and a half window before the acquisition announcement dates.

Table 1: Sample Selection

<ul style="list-style-type: none"> • All acquisitions by U.S. industrial public firms that are completed between 1994 and 2020 for which: <ul style="list-style-type: none"> - The form of the transaction is either acquisition of assets or a merger. - The acquired firms are classified by SDC as either private, public, or subsidiaries, and their names are disclosed. - Acquired firms are not listed in exchanges in non-US countries. - The effective date of acquisition is within 1000 days after an announcement date. - There is non-missing transaction information including transaction value, a payment method, the number of bidders, a deal attitude (i.e., friendly or negotiation). - The transaction value is greater than or equal to \$1M. - The acquiring firm owns 100% of the shares of target firms after the acquisition but does not own more than 50% of shares before the acquisitions. Both the acquiring and the acquired firms are in neither financial (SIC code 6000~6999) nor regulated industries (SIC code 4000~4999). - Acquiring and acquired firms do not have the same CUSIP or related names. 	20,116
<ul style="list-style-type: none"> • Acquisitions in which the acquiring firm <ul style="list-style-type: none"> - Is listed in either NYSE, AMEX, or NASDAQ, - Has a matched gvkey and permno; 	15,241
<ul style="list-style-type: none"> • Acquisitions in which the acquiring firm <ul style="list-style-type: none"> - Has non-missing Compustat assets, liability, equity, the market value of equity, net income and information on EDGAR Company Database for the company's central index key (CIK) in the year of a transaction. - Has non-missing CRSP information to estimate abnormal stock returns around M&A announcement dates. 	13,421
<ul style="list-style-type: none"> • Exclude publicly traded acquired firms if their stock price is not available within the last three years prior to acquisition announcement dates (CRSP). 	11,044

Table 2: Descriptive Statistics by Ownership Type of the Acquired Firm

Panel A: Summary Statistics																		
Statistic	Private (n = 9,460)						Quasi-private (n = 226)						Public (n = 1,358)					
	N	Mean	SD	25%	50%	75%	N	Mean	SD	25%	50%	75%	N	Mean	SD	25%	50%	75%
<i>Dependent Variables</i>																		
CAR (%)	9,460	1.520***	9.045	-2.097	0.616	4.174	226	4.768**	29.166	-1.785	1.995	6.317	1,358	-1.025***	7.353	-4.333	-0.627	2.387
GWIDLoss (Binary)	1,895	0.117***	0.322	0.000	0.000	0.000	74	0.108***	0.313	0.000	0.000	0.000	348	0.161***	0.368	0.000	0.000	0.000
GWI (Binary)	1,271	0.154***	0.361	0.000	0.000	0.000	62	0.113***	0.319	0.000	0.000	0.000	306	0.154***	0.361	0.000	0.000	0.000
DLoss (Binary)	1,895	0.018***	0.133	0.000	0.000	0.000	74	0.014	0.116	0.000	0.000	0.000	348	0.032***	0.175	0.000	0.000	0.000
ABRNOA (%)	6,113	-0.406	22.171	-5.211	-1.585	3.357	168	1.965	15.656	-4.937	-1.758	2.906	1,058	1.454***	13.772	-4.212	-0.916	4.946
<i>Deal, Acquiring, and Acquired Firm Characteristics</i>																		
MKCOND	9,460	0.495***	0.500	0	0	1	226	0.469***	0.500	0	0	1	1,358	0.452***	0.498	0	0	1
STOCK	9,460	0.176***	0.342	0	0	0.1	226	0.193***	0.350	0	0	0.2	1,358	0.386***	0.439	0	0	1
EARNOUT	9,460	0.107***	0.310	0	0	0	226	0.066***	0.249	0	0	0	1,358	0.008***	0.090	0	0	0
COMPETING	9,460	0.001***	0.036	0	0	0	226	0.009	0.094	0	0	0	1,358	0.057***	0.233	0	0	0
NEGOTIATED	9,460	0.997***	0.055	1	1	1	226	0.991***	0.094	1	1	1	1,358	0.985***	0.121	1	1	1
RELATIVE_SIZE	9,460	0.209***	1.134	0.021	0.061	0.170	226	0.594***	2.822	0.043	0.144	0.478	1,358	0.384***	0.562	0.047	0.185	0.515
%GW	9,460	0.231***	0.315	0	0	0.5	226	0.237***	0.319	0.000	0.000	0.470	1,358	0.245***	0.312	0	0	0.5
ACQ_MVE	9,460	6,493***	32,640	150	592	2,177	226	11,264***	37,268	425.835	1,3450	3,792	1,358	20,970***	51,505	552	2,599	12,517
ACQ_ROA (%)	9,460	2.405***	19.810	2.166	6.071	9.383	226	4.833***	10.231	2.919	5.986	9.407	1,358	4.845***	14.049	3.857	7.011	10.624
ACQ_MB	9,460	2.268***	2.833	1.073	1.552	2.454	226	1.998***	2.238	1.010	1.421	2.229	1,358	2.09***	1.938	1.106	1.607	2.411
ACQ_LEV	9,460	0.465***	0.231	0.288	0.465	0.606	226	0.531***	0.226	0.371	0.551	0.665	1,358	0.505***	0.215	0.362	0.511	0.623

*, **, and *** indicate that the mean value has p<0.1; **p<0.05; ***p<0.01.

Panel B: Correlation Matrix (Spearman (upper) – Pearson (lower))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) CAR		-0.03	-0.02	0.01	-0.04***	0.01	-0.03***	0.01	0.09***	0.01	-0.10***	-0.01	-0.04***	0.01
(2) GWIDLoss	-0.02		-0.13***	-0.07**	0.03	0.00	0.01	0.00	0.09***	0.02	-0.01	-0.02	-0.05*	-0.04
(3) ABRNOA	0.00	-0.03		-0.03*	-0.05***	-0.02	0.01	0.01	-0.21***	-0.04***	0.23***	0.22***	0.24***	0.04***
(4) MKCOND	0.01	-0.07**	-0.04**		-0.24***	0.09***	-0.01	0.00	-0.08***	0.65***	0.24***	-0.04***	-0.06***	0.03**
(5) STOCK	-0.03**	0.02	-0.01	-0.27***		-0.04***	0.02*	0.00	0.20***	-0.21***	-0.14***	-0.14***	0.18***	-0.14***
(6) EARNOUT	0.01	0.00	-0.04***	0.09***	-0.09***		-0.02*	0.01	0.04***	0.06***	-0.07***	-0.06***	0.01	-0.07***
(7) COMPETING	-0.02*	0.01	0.01	-0.01	0.02	-0.02*		-0.10***	0.07***	-0.01	0.04***	0.02	0.00	0.02
(8) NEGOTIATED	0.00	0.00	0.00	0.00	0.01	0.01	-0.10***		-0.03**	-0.01	-0.04***	-0.01	0.01	-0.01
(9) RELATIVE_SIZE	0.25***	0.05**	-0.04**	-0.03**	0.07***	-0.01	0.02*	-0.01		-0.10***	-0.50***	-0.18***	-0.34***	0.06***
(10) %GW	-0.02	0.02	-0.01	0.51***	-0.18***	0.02*	-0.01	0.00	-0.05***		0.28***	0.01	0.02	0.01
(11) ACQ_MVE	-0.03***	-0.02	0.12***	0.04***	0.00	-0.03**	0.02*	-0.01	-0.04***	0.06***		0.27***	0.31***	0.14***
(12) ACQ_ROA	-0.04***	0.00	0.19***	0.00	-0.16***	-0.05***	0.00	-0.01	-0.07***	0.05***	0.09***		0.30***	-0.07***
(13) ACQ_MB	-0.05***	-0.03	0.05***	-0.13***	0.26***	0.00	0.00	0.01	-0.06***	-0.06***	0.16***	-0.02		-0.30***
(14) ACQ_LEV	0.04***	-0.03	-0.05***	0.03***	-0.13***	-0.07***	0.02	-0.01	0.08***	0.01	0.01	-0.06***	-0.20***	

*p<0.1; **p<0.05; ***p<0.01.

This table presents descriptive statistics of the dependent variables related to deal characteristics, acquiring firm characteristics, and target firm characteristics. In Panel A, the summary statistics, mean, standard deviation, Q1, median, and Q3, of the variables are presented by the target firms' ownership and information structures (*p<0.1; **p<0.05; ***p<0.01). In Panel B, correlation coefficients with significance (*p<0.1; **p<0.05; ***p<0.01) are presented (Spearman (upper) and Pearson (lower)). Dependent variables include acquiring firms' three-days cumulative abnormal return around the acquisition announcement date (CAR) and an indicator for future acquired goodwill impairments (GWI) or divestitures (DLoss). Deal characteristics include the proportion of stock payment (STOCK), indicator variables whether the deal included an earnout (EARNOUT), whether deal was a competing bid (COMPETING), and whether the deal was negotiated (i.e., friendly) between the acquirer, target (NEGOTIATED), the relative size of the deal (RELATIVE_SIZE), and the proportion of goodwill (%GW). Variable definitions are presented in Appendix A. All continuous variables are winsorized at the top and bottom 1% by the fiscal year.

Table 3: Stock Market Reactions to M&A Announcements by Acquired Firm's Ownership

	Dependent variable: CAR (OLS)			
	Private vs. Public	Full Sample	Liquidity Effects (Quasi-private vs. Public)	Information Effects (Quasi-private vs. Private)
	(1)	(2)	(3)	(4)
Private	1.570*** (5.157)	1.422*** (4.336)		
Quasi-private		4.234*** (3.064)	1.687*** (2.975)	2.896* (1.905)
RELATIVE_SIZE *(- Sign of CAR)	-2.084* (-1.894)	-3.005* (-1.904)	-8.660*** (-8.132)	-2.858* (-1.780)
%GW	-0.037 (-0.210)	-0.143 (-0.666)	0.914 (1.140)	-0.364 (-1.507)
STOCK	-0.225 (-0.639)	-0.206 (-0.533)	-2.099*** (-3.852)	0.777* (1.796)
EARNOUT	-0.025 (-0.080)	0.031 (0.097)	2.674 (1.420)	0.019 (0.061)
COMPETING	-0.094 (-0.129)	0.108 (0.137)	1.103 (1.543)	-0.454 (-0.210)
NEGOTIATED	-0.694 (-0.764)	-0.534 (-0.594)	0.917 (0.795)	-1.239 (-0.995)
MKCOND	0.667* (1.854)	0.613 (1.634)	0.247 (0.492)	0.603 (1.297)
ACQ_MVE	-0.463*** (-7.019)	-0.480*** (-7.008)	-0.183* (-1.984)	-0.564*** (-7.787)
ACQ_ROA	-0.123 (-0.205)	-0.062 (-0.107)	0.922 (0.713)	0.017 (0.026)
ACQ_MB	-0.041 (-1.162)	-0.020 (-0.457)	-0.220** (-2.517)	-0.016 (-0.327)
ACQ_LEV	1.158 (1.402)	1.533* (1.811)	0.459 (0.530)	1.683* (1.772)
Robust SE (Year)	Yes	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes	Yes
Observations	10,818	11,044	1,584	9,686
- Public	1,358	1,358	1,358	0
- Private	9,460	9,460	0	9,460
- Quasi-private	0	226	226	226
Hypothesis Test (H0) (For column (2)) H0: Private = Quasi-private: t-statistic=3.45*				
Adjusted R ²	0.092	0.157	0.741	0.145

*p<0.1; **p<0.05; ***p<0.01. t-statistics are reported in parentheses below the estimated coefficients.

This table presents results from an OLS regression of acquiring firms' three-day cumulative abnormal return around the acquisition announcement date (*CAR*) on an indicator for acquired firm types. In column (1), we estimate differences in stock market reactions to the acquisitions of publicly traded firms and those of privately held firms. In columns (2) and (3), we use an indicator of privately held firms with publicly available financial statements (*Quasi-private*) as an independent variable to estimate differences in stock market reactions to the acquisitions of privately held firms with publicly available financial statements. In column (2), we compare the difference between the acquisitions of privately held firms with publicly available financial statements (*Quasi-private*) and publicly traded (*Public*) targets. In column (3), we compare the difference between the acquisitions of privately held firms without (*Private*) and with publicly available financial statements (*Quasi-private*). Control variables include, measured at the latest fiscal year-end before the transaction, the relative size (*RELATIVE_SIZE*), the size of goodwill divided by the transaction price (*%GW*), the proportion of stock payment (*STOCK*), indicator variables whether the deal included an earnout (*EARNOUT*), whether the deal was a competing bid (*COMPETING*), and whether the deal was negotiated (i.e., friendly) between the acquirer and acquired firms (*NEGOTIATED*), the market value of equity (*ACQ_MVE*), profitability (*ACQ_ROA*), the market-to-book ratio (*ACQ_MB*), and leverage (*ACQ_LEV*). Variable definitions are presented in Appendix A. We also include year-fixed effects and adjust standard errors (SE) for years.

Table 4: Abnormal RNOA by Acquired Firm's Ownership

	Dependent variable: <i>ABRNOA</i> (OLS)			
	Private vs. Public	Full Sample	Liquidity Effects (Quasi-private vs. Public)	Information Effects (Quasi-private vs. Private)
	(1)	(2)	(3)	(4)
Private	-0.698 (-1.430)	-0.715 (-1.513)		
Quasi-private		1.206 (1.604)	1.620* (1.971)	1.941** (2.308)
RELATIVE_SIZE	-0.077 (-0.121)	-0.229 (-0.416)	0.091 (0.184)	-0.494 (-0.724)
%GW	-1.479** (-2.273)	-1.593** (-2.542)	-2.595* (-1.782)	-1.368* (-2.023)
STOCK	-3.437*** (-3.489)	-3.220*** (-3.310)	-2.351*** (-3.451)	-3.357** (-2.434)
EARNOUT	-1.464** (-2.219)	-1.477** (-2.257)	-0.996 (-0.562)	-1.576** (-2.362)
COMPETING	0.440 (0.445)	0.297 (0.302)	-0.123 (-0.113)	0.205 (0.035)
NEGOTIATED	-1.202 (-1.065)	-1.211 (-1.122)	-0.423 (-0.404)	-2.367 (-1.168)
MKCOND	-0.107 (-0.113)	-0.195 (-0.226)	2.972 (1.067)	-0.872 (-1.093)
ACQ_POST3_MB	0.0001*** (5.344)	0.0001*** (4.968)	0.0001*** (5.100)	0.0001 (1.448)
ACQ_POST3_MVE	4.283*** (9.394)	4.375*** (10.102)	5.470*** (7.721)	4.318*** (8.151)
ACQ_POST3_LEV	-3.129** (-2.241)	-3.241** (-2.480)	-2.800 (-1.045)	-3.368** (-2.582)
Robust SE (Year)	Yes	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes	Yes
Observations	3,870	3,982	854	3,240
- Public	742	742	742	0
- Private	3,128	3,128	0	3,128
- Quasi-private	0	112	112	112
Hypothesis Test (H0)		(For column (2)) H0: Private = Quasi-private: χ^2 -statistic=6.02**		
Adjusted R ²	0.125	0.128	0.251	0.106

*p<0.1; **p<0.05; ***p<0.01. t-statistics are reported in parentheses below the estimated coefficients.

This table presents results from an OLS regression of acquiring firms' post-acquisition abnormal RNOA (*ABRNOA*) on an indicator for acquired firm types. *ABRNOA* is the residual of a regression of the three-year average of post-acquisition RNOAs on the three-year average of pre-acquisition RNOAs. In column (1), we estimate differences in stock market reactions to the acquisitions of publicly traded firms and those of privately held firms. In columns (2) and (3), we use an indicator of privately held firms with publicly available financial statements (Quasi-private) as an independent variable to estimate differences in stock market reactions to the acquisitions of privately held firms with publicly available financial statements. In column (2), we compare the difference between the acquisitions of privately held firms with publicly available financial statements (Quasi-private) and publicly traded (Public) targets. In column (3), we compare the difference between the acquisitions of privately held firms without (Private) and with publicly available financial statements (Quasi-private). Control variables include, measured at the latest fiscal year-end before the transaction, the relative size (*RELATIVE_SIZE*), the size of goodwill divided by the transaction price (*%GW*), the proportion of stock payment (*STOCK*) and indicator variables whether the deal included an earnout (*EARNOUT*), whether the deal was a competing bid (*COMPETING*), and whether the deal was negotiated (i.e., friendly) between the acquirer and acquired firms (*NEGOTIATED*). Acquiring firms' post-acquisition characteristics, (MVE, MB, and LEV), measured as the post-acquisition three-year average: the market value of equity (*ACQ_POST3_MVE*), the market-to-book ratio (*ACQ_POST3_MB*), and leverage (*ACQ_POST3_LEV*). Variable definitions are presented in Appendix A. We also include year-fixed effects and adjust standard errors (SE) for years.

Table 5: Future Goodwill Impairments or Divestitures-at-a-loss by Acquired Firm's Ownership (Average Marginal Effects at Means (AME))

	Dependent variable: <i>GWIDLoss</i> (Logit)			
	Private vs. Public	Full Sample	Liquidity Effects (Quasi-private vs. Public)	Information Effects (Quasi-private vs. Private)
	(1)	(2)	(3)	(4)
Private	-0.037 (-1.356)	-0.034 (-1.290)		
Quasi-private		-0.034 (-0.997)	-0.061** (-2.046)	-0.001 (-0.030)
RELATIVE_SIZE	0.048*** (2.901)	0.049*** (2.754)	0.066** (2.130)	0.033* (1.856)
%GW	0.024 (1.017)	0.026 (1.116)	-0.104*** (-3.075)	0.044** (2.080)
STOCK	-0.007 (-0.323)	-0.004 (-0.206)	-0.080** (-2.005)	0.029 (1.305)
EARNOUT	0.010 (0.511)	0.011 (0.563)	-0.013 (-0.143)	0.014 (0.745)
COMPETING	-0.017 (-0.276)	-0.015 (-0.247)	-0.012 (-0.184)	-0.110*** (-51.648)
NEGOTIATED	0.018 (0.216)	0.027 (0.404)	0.126*** (18.728)	-0.043 (-0.449)
MKCOND	-0.081 (-1.425)	-0.079 (-1.386)	-0.064 (-0.379)	-0.054 (-1.314)
ACQ_MVE	-0.00002 (-0.005)	0.001 (0.170)	0.004 (0.350)	0.001 (0.144)
ACQ_ROA	-0.0002 (-0.384)	-0.0002 (-0.489)	-0.001 (-0.365)	-0.0001 (-0.159)
ACQ_MB	-0.011 (-1.336)	-0.013 (-1.578)	0.004 (0.426)	-0.021*** (-2.685)
ACQ_LEV	-0.057** (-2.412)	-0.066*** (-2.805)	0.072 (1.418)	-0.098*** (-3.616)
Robust SE (Year)	Yes	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes	Yes
Observations	2,243	2,317	422	1,969
- Public	348	348	348	0
- Private	1,895	1,895	0	1,895
- Quasi-private	0	74	74	74
Hypothesis Test (H0)		(For column (2)) H0: Private = Quasi-private: χ^2 -statistic = 0.03		
Pseudo R2	0.021	0.022	0.109	0.027

*p<0.1; **p<0.05; ***p<0.01. z-statistics are reported in parentheses below the estimated coefficients.

This table presents results from a logit regression of future goodwill impairments or divestitures-at-a-loss (*GWIDLoss*) on an indicator for target firm types. In column (1), we estimate the difference in the probability of future goodwill impairment or divestiture-at-loss related to the acquisitions of publicly traded targets and those of privately held targets. For column (1), the sample consists of U.S. publicly traded firms' acquisitions of U.S. firms, and an independent variable is an indicator for publicly traded targets (Public). In columns (2) and (3), we use an indicator for privately held targets with publicly available financial statements (Quasi-private) as an independent variable to estimate the difference in the probability of future goodwill impairment or divestiture-at-losses related to the acquisitions of privately held targets with publicly available financial statements. In column (2), we compare the difference between the acquisitions of privately held targets with publicly available financial statements (Quasi-private) and publicly traded (Public) targets. In column (3), we compare the difference between the acquisitions of privately held targets without (Private) and with publicly available financial statements (Quasi-private). Control variables include, measured at the latest fiscal year-end before the transaction, the relative size (*RELATIVE_SIZE*), the size of goodwill divided by the transaction price (*%GW*), the proportion of stock payment (*STOCK*), indicator variables whether the deal included an earnout (*EARNOUT*), whether the deal was a competing bid (*COMPETING*), and whether the deal was negotiated (i.e., friendly) between the acquirer and target (*NEGOTIATED*), the market value of equity (*ACQ_MVE*), profitability (*ACQ_ROA*), the market-to-book ratio (*ACQ_MB*), and leverage (*ACQ_LEV*). Variable definitions are presented in Appendix A. We also include year-fixed effects and adjust standard errors (SE) for years.

Table 6: Quasi-private vs. Private Acquired Firms with Ex-Post Disclosure of Financial Statements

	CAR (1)	ABRNOA (2)	GWIDLoss (3)
Quasi-private	2.352* (1.663)	2.927*** (2.796)	-0.003 (-0.083)
RELATIVE_SIZE *the opposite sign of CAR	-2.637* (-1.722)		
RELATIVE_SIZE		-0.135 (-1.004)	0.015 (0.593)
%GW	-1.779 (-1.532)	-2.096 (-1.344)	0.080** (2.176)
STOCK	0.427 (0.565)	-3.050** (-2.097)	0.024 (0.611)
EARNOUT	-0.580 (-0.913)	-2.380* (-1.906)	0.036 (1.247)
COMPETING	0.365 (0.116)		-0.118*** (-10.270)
NEGOTIATED	0.633 (0.196)		-0.084 (-0.574)
MKCOND	1.676 (1.290)	0.093 (0.028)	-0.033 (-0.465)
ACQ_MVE	-0.921*** (-3.930)		-0.003 (-0.330)
ACQ_ROA	0.024* (1.815)		0.0001 (0.107)
ACQ_MB	0.020 (0.256)		-0.023** (-2.007)
ACQ_LEV	4.416* (1.726)		-0.071 (-1.453)
ACQ_POST3_MB		-0.00002 (-1.055)	
ACQ_POST3_MVE		3.107*** (5.905)	
ACQ_POST3_LEV		-8.141*** (-3.052)	
Robust SE (HC)	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes
Observations	2,789		884
- Public	0		0
- Private	2,563		810
- Quasi-private	226		74
Adjusted R ²	0.180		
Pseudo R ²			0.04

*p<0.1; **p<0.05; ***p<0.01. t-statistics (in columns (1) and (3)) and z-statistics (in column (2)) are reported in parentheses below the estimated coefficients.

This table presents results from an OLS regression of *CAR* in column (1), from an OLS regression of *ABRNOA* in column (2), and from a logit regression of *GWIDLoss* in column (3) with the sample of quasi-private acquired firms and private acquired firms for which the investment ratio, defined as the ratio of the price of the acquisition to the total assets of the acquirer, is equal to or greater than 20%. For column (2), the coefficients of *COMPETING* and *NEGOTIATED* are omitted for multicollinearity. Following Chen (2019), the regressions include year-fixed effects, and the standard errors (SE) are adjusted for heteroskedasticity. Variable definitions are presented in Appendix A

Table 7: Robustness Tests

Panel A: Entropy-balance Reweighted Sample

A-1: CAR		Dependent variable: CAR (OLS)		
	Private vs. Public	Full Sample	Liquidity Effects (Quasi-private vs. Public)	Information Effects (Quasi-private vs. Private)
	(1)	(2)	(3)	(4)
Private	0.374 (1.315)	0.338 (1.185)		
Quasi-private		0.991** (2.297)	1.174** (2.443)	0.990* (1.934)
Robust SE (Year)	Yes	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes	Yes
Observations	10,818	11,044	1,584	9,686
- Public	1,358	1,358	1,358	0
- Private	9,460	9,460	0	9,460
- Quasi-private	0	226	226	226
Adjusted R ²	0.403	0.405	0.438	0.375

A-2: ABRNOA		Dependent variable: ABRNOA (OLS)		
	Private vs. Public	Full Sample	Liquidity Effects (Quasi-private vs. Public)	Information Effects (Quasi-private vs. Private)
	(1)	(2)	(3)	(4)
Private	0.227 (0.282)	0.195 (0.245)		
Quasi-private		2.153** (2.271)	1.721* (2.018)	2.107** (2.288)
Robust SE (Year)	Yes	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes	Yes
Observations	3,870	3,982	854	3,240
- Public	742	742	742	0
- Private	3,128	3,128	0	3,128
- Quasi-private	0	112	112	112
Adjusted R ²	0.136	0.138	0.269	0.193

A-3: GWIDLoss		Dependent variable: GWIDLoss (Logit)		
	Private vs. Public	Full Sample	Liquidity Effects (Quasi-private vs. Public)	Information Effects (Quasi-private vs. Private)
	(1)	(2)	(3)	(4)
Private	-0.008 (-0.658)	0.004 (0.429)		
Quasi-private		-0.014* (-1.799)	0.013 (0.245)	0.038 (0.783)
Robust SE (Year)	Yes	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes	Yes
Observations	2,243	2,317	422	1,969
- Public	348	348	348	0
- Private	1,895	1,895	0	1,895
- Quasi-private	0	74	74	74
Pseudo R ²	0.093	0.105	0.175	0.087

Panel B: Transactions made by Firms Acquiring Different Types of Firms

	Dependent variable: CAR (OLS)			
	Private vs. Public	Full Sample	Liquidity Effects (Quasi-private vs. Public)	Information Effects (Quasi-private vs. Private)
	(1)	(2)	(3)	(4)
Private	1.320*** (4.739)	1.058* (1.693)		
Quasi-private		2.006** (2.306)	1.620 (1.377)	1.360*** (3.118)
Robust SE (Year)	Yes	Yes	Yes	Yes
FE (Year)	Yes	Yes	Yes	Yes
Observations	3,958	803	286	1,103
- Public	1,135	182	188	0
- Private	2,823	528	0	918
- Quasi-private	0	93	98	185
Adjusted R ²	0.210	0.219	0.227	0.195

*p<0.1; **p<0.05; ***p<0.01. t-statistics (in Panels A-1, A-2, and B) and z-statistics (in Panel A-3) are reported in parentheses below the estimated coefficients. Panel A shows the results of the same analysis conducted in Table 3 (Panel A-1), Table 4 (Panel A-2), and Table 5 (Panel A-3), except for the weight of the sample transactions. We apply the entropy balancing weighting scheme, which balances the mean of covariates among transactions with different acquired firm types. Panel B shows the results of the same analysis conducted in Table 3, except for the sample transactions. The sample transactions are included only if they are made by firms that have acquired different types of firms.