The use of escrow contracts in acquisition agreements*

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Abstract:

A large fraction of acquisition deals for private firm and subsidiary targets include an escrow contract giving the bidder the opportunity to lay claim on escrow account funds if subsequent to the acquisition the seller fails to meet specific acquisition agreement terms. The likelihood of using an escrow contract is higher when buyer or seller transaction risk is larger. Also, the use of escrow contracts (i) helps to reduce bidders' due diligence costs, (ii) enables sellers to obtain a higher sale price, and (iii) raises the extent to which an acquisition leads to an increase in bidder firm shareholder value.

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I. Introduction

Most acquisitions made by publicly traded firms consist of acquisitions of unlisted targets, i.e., targets that are stand-alone private firms or subsidiaries of other firms (Fuller, Netter, and Stegemoller (2002) and Netter, Stegemoller, and Wintoki (2011)). However, there is only limited empirical evidence on acquisitions of unlisted targets in prior work, which restricts our understanding of these types of acquisitions, and of mergers and acquisitions in general.[1] In this paper, we study escrow contracts, which are employed in approximately half of acquisitions of unlisted targets, but are not used in acquisitions of publicly traded targets.[2] When these contracts are used the bidder places 10-15% of the total sale proceeds in an escrow account, and the funds are held in this account for one to two years after the completion of the acquisition. Bidders can lay claim on the funds in the escrow account to cover their losses if the sellers fail to meet specific terms of the acquisition agreement or it is found that negative information about the target was withheld from the bidder prior to the sale. In our tests, we first investigate what determines the use of escrow contracts in private firm and subsidiary acquisitions. Next, we examine if these contracts create real value by allowing buyers and sellers to reduce acquisition-related costs and manage the large transaction risk inherent in private firm and subsidiary acquisitions.

For a sample of 569 acquisitions of stand-alone private firms and 374 subsidiary acquisitions over the 1994-2009 period, we hand-collect data on escrow contracts from bidder firms' 8-K, DEF 14A, 10-Q, and 10-K filings. We find that escrow contracts are employed in 52.1% of the acquisitions of unlisted targets we study. We also document that for the deals with

[1] The existing empirical evidence on acquisitions of unlisted targets shows that when public bidders acquire such targets they tend to earn positive abnormal returns (e.g., Chang (1998), Fuller, Netter, and Stegemoller (2002), Faccio, McConnell, and Stolin (2006), and Cooney, Moeller, and Stegemoller (2009)) and that the use of stock to pay for these acquisitions helps to reduce information asymmetry about the value of the target (Officer, Poulsen, and Stegemoller (2009)). Also, the price paid for unlisted targets is typically lower than that for similar public targets because of the need to compensate bidders for the larger opacity of unlisted targets and because the sellers of unlisted targets are often financially constrained and these deals provide liquidity for the sellers (Officer (2007)).

[2] When an escrow contract is included in an acquisition agreement all target shareholders need to individually sign a contract with the bank that maintains the escrow account. Hence, escrow contracts are not used in acquisitions of publicly traded firms due to the very large number of shareholders who would need to sign these related contracts.

an escrow contract, on average, 12.2% of the sale proceeds are placed in an escrow account and the funds are held in the escrow account for about 17.4 months.

We investigate whether the likelihood that an escrow contract is employed in the context of an acquisition is greater when it is more important for the bidder to manage acquisition-related transaction risk. We first compare the use of escrow contracts in subsidiary versus private stand-alone firm acquisitions. In the case of subsidiary acquisitions, a bidder would have legal recourse post-deal closure against both the parent firm that sold the subsidiary and the principal shareholders of the parent firm, while for private firm acquisitions the bidder would only have recourse against the principal shareholders of the target. Consequently, we expect that bidder acquisition-related transaction risk is higher in the case of private firm acquisitions than subsidiary acquisitions, and that as a result, escrow contracts are used more often in private firm acquisitions. Our findings are consistent with this prediction. We document that escrow contracts are used in 65% of private firm acquisitions, but that these contracts are used in only 32% of subsidiary acquisitions. Further, in multivariate tests we show that whether an acquisition is a private firm acquisition positively impacts the likelihood that an escrow contract is used.

When the relative size of the target to the bidder is greater it should be more important for the bidder to manage acquisition-related transaction risk. Thus, in these cases the use of an escrow contract should be more prevalent. Supporting this prediction, we find that the relative size of the target to the bidder has a positive effect on the likelihood that an escrow contract is employed in the context of an acquisition.

Because when there is more information asymmetry about the target's value the bidder faces greater transaction risk, in these instances the benefits to using an escrow contract should be larger. We consider five cases in which information asymmetry about a target's value is likely greater. First, we assume there is more information asymmetry about a target's value if it operates in an industry with higher earnings volatility. Second, we expect that if there are fewer distinct

analysts covering the publicly traded firms in a target's industry this makes it more difficult to value unlisted targets in the industry, which leads to greater information asymmetry about these targets. Third, we consider if the target operates in a different industry than does the bidder, assuming that if so, then information asymmetry problems are larger. Fourth, we look to a target's total accruals, as measured by the difference between its earnings and its free cash flows and follow prior work (e.g., Dechow and Dichev (2002)) that argues that when a firm's total accruals are greater it is more difficult for investors to infer the firm's financial performance and its value from its earnings. Finally, we expect that there is greater information asymmetry about the value of financially distressed targets. Here, we use a target's interest coverage ratio to proxy for if it is likely financially distressed. Consistent with our predictions, we find that whether an escrow contract is used in the context of the acquisition of an unlisted target is positively associated with: (1) earnings volatility in the target's industry, (2) if there is a smaller number of analysts covering the target's industry, (3) if the target operates in a different industry than does the bidder, (4) the target's total accruals, and (5) if a target's interest coverage ratio is low.

We also investigate whether escrow contracts are used to reduce target-side acquisition-related transaction risk. When a target has a dominant shareholder, defined as a shareholder who owns at least 20 percent of the target's shares but not all of its shares, an escrow contract can be particularly useful to manage this shareholder's transaction risk. If such a contract is in place all target shareholders would bear pro rata costs of bidder recourse actions following an acquisition. In contrast, if such a contract is not in place in most cases bidder recourse actions subsequent to an acquisition would result in the target's dominant shareholder being held liable and sued by the bidder.[3] Supporting the proposition that an important motive for escrow contracts is that they help reduce the transaction risk of a target's dominant shareholder, we find that the presence of a target

[3] In such cases, the dominant shareholder could then try to sue the smaller shareholders to recover some of their share of the sale proceeds. However, given that these recourse lawsuits are costly, the use of an escrow contract would be a more efficient way for the dominant shareholder to manage acquisition-related transaction risk.

dominant shareholder positively impacts the likelihood that an escrow contract is used.

In acquisitions of unlisted targets a bidder's due diligence costs are often large relative to deal value as a result of significant information asymmetry about the target's value. However, because the use of an escrow contract would reduce a bidder's costs if after the acquisition it is found that negative information about the target was withheld from the bidder, the use of such a contract should reduce a bidder's need to incur very high due diligence costs when acquiring an unlisted target. We run tests that provide insights on the extent to which an escrow contract creates real value by lowering a bidder's due diligence costs. To do so, we proxy for these costs with the length of the period between the announcement of a preliminary acquisition agreement and the completion of the deal, assuming that when this period is longer the bidder conducts more due diligence on the target. We focus on the period between these two dates because prior to the signing of the preliminary acquisition agreement the sellers of a target will typically only provide a bidder with a limited amount of information about the target and thus it would not be possible for the bidder to conduct major due diligence on the target. However, after this agreement is signed the sellers are contractually obligated to provide the bidder with broad access to private information about the target, and the bidder can then begin extensive due diligence on the target, such as verifying the accuracy of the target's accounting information, the physical condition of the target's assets, or if the sellers of the target have appropriately represented the target's total liabilities.[4]

We find evidence consistent with the use of an escrow contract leading a bidder to reduce the amount of due diligence it conducts on an unlisted target. Specifically, the use of such a contract is associated with about a 35% decrease in the length of the period between the announcement of a preliminary acquisition agreement and the completion of the deal. Further, this result is robust to accounting for the potential endogeneity of having an escrow contract in place.

[4] Marquardt and Zur (2014), Amel-Zadeh and Zhang (2014), and Wangerin (2015) also use the length of the period between the announcement of a preliminary acquisition agreement and the completion of the deal as a measure for a bidder's due diligence costs and validate the use of this measure.

Next, we investigate if the use of escrow contracts leads to a creation of real value, which is shared by the buyer and seller parties. As previously discussed, the use of an escrow contract is expected to result in value creation because it ought to reduce a bidder's need to incur large due diligence costs. If the bidder agrees to pass on to the sellers a portion of this created value then we should observe that the use of an escrow contract positively impacts the total amount of the proceeds received by the sellers of an unlisted target, even after accounting for the portion of the funds in the escrow account predicted to be kept by the bidder. Given the evidence in Officer (2007) that in stand-alone private firm and subsidiary acquisitions targets are typically sold at significant discounts relative to the prices paid for comparable public targets, we examine if the use of an escrow contract reduces this price discount. We find that, indeed, the use of an escrow contract lowers the discount in the price paid for an unlisted target and that this result is robust to controlling for the potential endogeneity of having an escrow contract in place. After accounting for potential costs to the sellers if the bidder ends up receiving some of the funds in the escrow account, we estimate that, on average, the use of an escrow contract is associated with a 3.5% increase in the total proceeds received by the sellers of an unlisted target. This effect is more pronounced when the use of an escrow contract is expected to reduce bidder due diligence costs to a larger degree, and thus, the real value created by the use of an escrow contract would be larger. Specifically, the extent to which using an escrow contract reduces the discount in the final price paid for an unlisted target is greater when a target is a private stand-alone firm, the relative size of the target to the bidder is larger, or there is more information asymmetry about the target's value.

Finally, we examine whether the use of an escrow contract in the acquisition of an unlisted target increases the extent to which the acquisition leads to value creation for the bidder. This should be the case if not all of the cost savings for a bidder from using an escrow contract are passed on to the target in the form of a higher acquisition price. We find that bidder acquisition announcement returns are positively associated with the use of an escrow contract, and also show

that this result is robust to accounting for the potential endogeneity of having an escrow contract in place. Further, we document that this effect is more pronounced when the reduction in bidder due diligence costs from using an escrow contract is anticipated to be greater, as proxied for by a target being a stand-alone private firm, a higher value for the relative size of the target to the bidder, or the existence of greater information asymmetry about the value of the target.

Overall, our paper makes several contributions. First, we document that escrow contracts are used in more than 50% of acquisitions of unlisted targets and the results of our tests on the determinants and effects of escrow contracts shed light on how the participants in these transactions solve contracting problems. This is important because although much is known about acquisitions of publicly traded targets, our understanding of the process in private firm and subsidiary acquisitions, which account for the majority of takeover activity, is relatively limited. Second, our findings provide new insights on the determinants of the method of payment used in corporate acquisitions and how it can be a function of buyers and sellers trying to manage acquisition-related transaction risk.[5] Finally, our paper also contributes to the broader literature on how financial contracts can create real value and resolve problems between contracting parties resulting from information asymmetry and moral hazard (e.g., Myers and Majluf (1984), Grossman and Hart (1986), Hart and Moore (1990), and Kaplan and Stromberg (2003)).

The remainder of the paper is organized as follows. Section II reports institutional details on the use of escrow contracts in acquisition agreements. Section III discusses our sample and methodological issues, and provides the results of univariate tests. Section IV presents our multivariate results. Finally, Section V concludes.

[5] An additional benefit to studying escrow contracts is that these contracts are an acquisition-related contracting mechanism that is settled after deal completion. With the exception of papers that study earnout contracts in which earnout payments are used to provide incentives to a target firm's managers to remain with the firm post-acquisition and maximize acquisition related synergies, prior work that studies contracting mechanisms used in mergers and acquisitions, such as Denis and Macias (2013) who examine material adverse change clauses, focuses on mechanisms that are settled prior to deal completion. In Section III of the paper we show that the use of escrow contracts is not correlated with the use of earnout contracts and discuss major differences between the two types of contracts.

II. Institutional Details on the Use of Escrow Contracts in Acquisition Agreements

When an escrow contract is included in an acquisition agreement a percentage of the total sale proceeds is placed in an escrow account, which is held for a negotiated period of time after the acquisition. The funds in the escrow account are used to cover bidder losses resulting from seller breaches of representations and warranties made to the bidder in the acquisition agreement. For instance, if after the completion of an acquisition it is found that the sellers misstated in their representations and warranties the target's earnings before depreciation and amortization, the bidder firm could lay claim to some of the funds in the escrow account. Likewise, a bidder could make a claim on these funds to address purchase price adjustments, if after the acquisition it is determined that the physical condition and value of certain of the target's assets differ from what was represented by the sellers. Another common reason why a bidder might make a claim on escrow account funds is if the target's working capital (i.e., accounts receivable, inventory, and other current assets) was misrepresented by the sellers. Also, if the sellers misstate what are the target's total liabilities, including liabilities such as environmental liabilities, pending litigation, contractual obligations related to collective bargaining agreements, or unpaid taxes due, the bidder could make a claim on some of the escrow account funds.[6]

While negotiating what is the percentage of the sale proceeds placed in the escrow account and how long the funds are kept in the account, the bidder and sellers also decide on an escrow agent and an arbitrator to resolve disputes related to bidder claims on the escrow account funds. The escrow agent is often a division of a bank holding company, such as the escrow services division of J.P. Morgan Chase. The funds placed in the escrow account are held by the escrow agent until the remaining funds are to be disbursed back to the sellers of the target, as stipulated in

[6] An alternative to using an escrow contract to manage acquisition-related transaction risk is to purchase insurance to manage this risk from an insurance brokerage firm such as Marsh & McLennan Company. However, the costs for a bidder to purchase such insurance are usually considerably higher than would be the costs involved in establishing an escrow contract. Moreover, coverage by such insurance policies is usually very limited in scope when compared to uses of escrow funds as written in the escrow contract.

the escrow contract. In return for being the custodian of the funds, the escrow agent typically receives a fixed fee and earns some interest on the funds with the remainder of the interest earned on the funds going to the sellers of the target.[7]

Even though using an escrow contract can significantly reduce transaction-related litigation after deal completion, disputes may arise as to the use of the escrow account funds. When such disputes occur, parties commonly rely on the provisions of the escrow contract for arbitration. Arbitrators used in conjunction with escrow contracts are typically hired from organizations that specialize in alternative dispute resolution (i.e., alternative to litigation in court). Examples of these organizations include the American Arbitration Association and the Judicial Arbitration and Mediation Services. These organizations typically hire arbitrators who are retired judges, attorneys, or business executives with relevant experience and expertise. In return for their services, arbitrators typically earn a fixed fee and/or a variable fee that is a percentage of the dispute value. Arbitrators' decisions relating to bidder claims on escrow account funds can be binding or non-binding, and that is written up in the escrow contract. In the case of non-binding arbitration, the arbitrator's decision could be challenged in court, which would lead to additional legal costs and to information about the dispute becoming public knowledge. Therefore, using binding arbitration is typically the more efficient and commonly observed approach.[8]

III. Sample, Methodology, and Univariate Results

We compile data for this paper from several sources. Our sample of acquisitions includes transactions that meet the following criteria: (i) the acquisition deal is for an unlisted target (either a stand-alone private firm or a subsidiary of another firm), it is announced and completed over the

[7] We note that in cases where the method of payment is a combination of cash and bidder stock, cash is placed in the escrow account. However, if the method of payment consists only of bidder stock then the funds placed in the escrow account are in the form of bidder stock and no interest is earned on these funds.

[8] The bidder and seller could also stipulate in the escrow contract that a mediator will be used to help resolve disputes. However, mediators' suggested solutions to a dispute are non-binding, and as such, in most cases using an arbitrator who makes binding decisions is anticipated to be a more efficient way to resolve escrow contract disputes.

1994-2009 period, and it is included in the Securities Data Corporation (SDC) U.S. Mergers and Acquisitions database, (ii) the acquirer is a public company that is included in the Compustat and CRSP databases, (iii) the size of the deal is at least 25 million dollars (this ensures that the deals we examine are economically important and makes it easier to collect necessary data on escrow contracts from SEC filings), (iv) there is less than 50% pre-acquisition ownership of the target by the bidder and the bidder acquires full ownership of the target post-acquisition, and (v) the target is included in Pratt's Statistics Database (discussed below) enabling us to collect accounting data on the target. Having imposed these requirements, our sample consists of 943 acquisitions.

We use the Pratt's Statistics database, maintained and distributed by the Business Valuation Resources LLC, as our source for accounting data about the targets in our sample. We rely on this database because detailed accounting data for most private stand-alone targets and subsidiary targets is not available from the SDC database. The Pratt's Statistics database provides deal-related information for acquisitions in which publicly traded acquirers purchase private stand-alone companies or subsidiary targets and for which it is possible through 8-K and DEF14A searches to obtain an income statement for the target and to determine the sale date and the selling price.

We hand-collect data on escrow contracts from acquisition or merger agreements contained in bidders' 8-K, DEF 14A, 10-Q, and 10-K filings. Specifically, we first establish whether an escrow contract is used in the context of an acquisition, and if so, we hand-collect information on the amount of funds placed in the escrow account and the length of time the funds are kept in the account. We also hand-collect from these filings data on the use of caps that limit the amount that a bidder could sue the target for and on the ownership structure of the unlisted target.

Tables 1 to 3 provide descriptive statistics for our sample and compare deals with and without escrow contracts. Panel A of Table 1 reports that 491 out of the 943 (52.1%) deals in our sample use an escrow contract. For these deals, on average, 12.2% of the sale proceeds are placed in an escrow account, which represents about $11.7 million dollars. The average length of time

that the funds are kept in the escrow account is 17.4 months. Panel A of Table 1 also compares escrow contract characteristics in deals for stand-alone private firm targets and subsidiary targets. Although the dollar amount kept in the escrow account and the length of time the funds are kept in the account are similar across the two types of targets, the percentage of the sale proceeds kept in the account is a bit higher in the case of private firm targets. Specifically, the average values for this percentage for private firm and subsidiary targets are, respectively, 13.0% and 8.9%.

Panel A also reports evidence for the deals we study on the discount in the price paid for an unlisted target relative to the prices paid for comparable public targets. To calculate the discount in the price of an unlisted target we use an approach similar to that in Officer (2007). We match each private firm or subsidiary target to a portfolio of comparable acquisitions of publicly traded targets that are identified from the SDC database. The acquisitions of publicly traded targets are permitted to enter multiple portfolios matched to unlisted targets. The comparable acquisitions of publicly traded targets are for targets in the same two-digit SIC code industry as the unlisted target in our sample for which the deal value is within 20% of the deal value of the unlisted target. We also require that the comparable transactions are announced within the 36-month window centered on the announcement of the acquisition of the unlisted target. To calculate the unlisted target discount, we use the deal-value-to-sales multiple. We do not use the deal-value-to-EBITDA multiple because it is negative for 32% of private firm targets and 31% of subsidiary targets in our sample. The discount in the price paid for an unlisted target is calculated as the percent difference between the deal-value-to-sales multiple for the unlisted target and the median deal-value-to-sales multiple for the portfolio of comparable public target acquisitions. Thus, the price discount is a negative number if the deal-value-to-sales multiple for the unlisted target is less than the median multiple of the matched comparable targets and a positive number if the reverse is the case. [9]

[9] Following Officer (2007), we do not calculate a value for the unlisted target price discount for deals in which the price multiple for an unlisted target is more than 100% larger than that of the portfolio of comparable publicly traded targets matched to it.

Panel A of Table 1 shows that the average unlisted target price discount for our sample is 24.3% and that the average values for the subsamples consisting of only private stand-alone firm targets and subsidiary targets are 17.1% and 33.3%. These findings are similar to those in Officer (2007). He finds average discounts of 18% and 30% for stand-alone private firm targets and subsidiary targets when using the deal-value-to-sales multiple.[10] Panel A also shows that the average unlisted target price discount is 19.6% for deals with an escrow contract and 28.9% for deals without such a contract in place. One factor that may lead to the discount being lower for targets with an escrow contract is that because the use of an escrow contract is expected to reduce bidder due diligence costs, bidders may be willing to increase their offer price when an escrow contract is included within the acquisition agreement. In Table 6 we report the results of tests that examine this issue in a multivariate context after accounting for both the potential endogeneity that an escrow contract is included in an acquisition agreement and costs to the sellers if the bidder ends up receiving some of the funds in the escrow account.

Panel B of Table 1 reports statistics on target characteristics for all the deals in our sample, and also for the subsamples with or without an escrow contract. Targets tend to be smaller for the deals with an escrow contract than without (median deal value of $68.1 million versus $80.0 million). Also, targets tend to have lower ROA (median values of 0.035 versus 0.040) and a lower interest coverage ratio (median values of 1.93 versus 3.89) in deals with an escrow contract.

Panel A of Table 2 reports information on additional deal characteristics for the acquisitions in our sample and also provides information on how these characteristics differ between deals with and without escrow contracts. This evidence provides preliminary insights on what determines the inclusion of escrow contracts in acquisition agreements. This panel first documents that for deals with escrow contracts as compared to deals without escrow contracts

[10] The evidence in Officer (2007) suggests that one reason why the average discount in the price paid for subsidiary targets is particularly large is that the parent firm selling a subsidiary often has urgent liquidity needs.

there is a significantly higher fraction of deals that are stock purchase transactions in which the bidder becomes responsible for the target's liabilities (80.0% versus 66.8%).[11] This result supports the prediction that the use of escrow contracts is more prevalent when a bidder's acquisition-related transaction risk is greater. Further supporting this prediction, Panel A shows that when an escrow contract is used (not used) that 75.6% (43.8%) of the deals are for private stand-alone firm targets, for which as discussed earlier a bidder's acquisition-related transaction risk is higher.[12]

Panel A of Table 2 also provides evidence on whether the use of an escrow contract is associated with seller-side acquisition transaction risk. This panel shows that in deals that use escrow contracts the fraction of the deals with a dominant target shareholder (defined as a shareholder who owns at least 20% of the target's stock, but not all of its stock) is markedly higher than it is for the deals that do not use an escrow contract (48.3% versus 24.1%).[13] As noted earlier, an escrow contract can be particularly useful to manage a dominant shareholder's acquisition-related transaction risk as it reduces the likelihood that to obtain recourse the bidder would sue this shareholder. Thus, this evidence supports the notion that a key motive for escrow contracts is that they aid in lowering the transaction risk of a target's dominant shareholder. As well, Panel A shows that the fraction of deals in which the bidder agrees to a cap on the dollar amount that the sellers of the target could be sued for subsequent to the acquisition is significantly greater among the deals with an escrow contract than the deals without such a contract (85.3% versus 61.1%). This result supports the notion that if a bidder agrees to such a cap this then makes it easier to persuade the sellers of the target to include an escrow contract in the acquisition agreement.

[11] We note that stock purchase transactions differ from stock-for-stock mergers. While the latter represent statutory mergers where the means of payment is stock, the former represents the purchase of a company by the means of purchasing its authorized and issued stock with either cash or stock of the acquirer. Unlike stock purchases, asset purchases represent agreements where the target sells certain assets in exchange for either cash or stock of the bidder, and in which the bidder does not become responsible for target liabilities.

[12] As shown in Panel A of Table 2, 39.7% of the deals we study are acquisitions of subsidiary targets. In the majority of these deals (204 out of the 374 deals) the parent firm of the subsidiary is a privately held firm.

[13] Although not tabulated, we find that in 48.5% of acquisitions of stand-alone private firms the target has a dominant shareholder and that in 18.7% of subsidiary acquisitions there is such a target shareholder.

As well, Panel A reports evidence on the fraction of deals in which the method of payment is only stock or only cash. It could be the case that when there is significant information asymmetry about the value of a target that this would increase the likelihood that both an escrow contract is used and that stock is the method of payment because this form of payment can mitigate contracting problems resulting from information asymmetry about the value of the target (e.g. Hansen (1987) and Officer, Poulsen and Stegemoller (2009)). On the other hand, given that in most cases the funds in the escrow account are cash this could raise the probability that when an escrow contract is used the method of payment is only cash. Panel A shows that in deals with an escrow contract the fraction of deals in which the method of payment is only stock is higher than it is in deals that do not use an escrow contract (11.2% versus 6.6%). Also, this panel documents that when an escrow contract is used that the percentage of deals in which the method of payment is only cash is lower than is the case when an escrow contract is not used (31.8% versus 42.0%).

Finally, given that prior work has studied earnout contracts, which provide for future payments to target firm managers contingent on some observable measure of performance (e.g., Kohers and Ang (2000), Datar, Frankel and Wolfson (2001), and Cain, Denis, and Denis (2011)), we also report evidence in Panel A of Table 2 on if the use of earnout contracts is related to the use of escrow contracts. Extant work documents that earnout contracts are used more often in acquisitions of unlisted targets than in acquisitions of publicly traded targets, but that the use of earnout contracts is relatively infrequent for both types of acquisitions. Consistent with this notion, Panel A shows that earnout contracts are used in only 12.2% of the deals in our sample. Thus, these contracts are used significantly less often than are escrow contracts, which are used in 52.1% of the deals we study. This panel also documents that there is no significant difference with respect to the use of an earnout contract between deals with or without an escrow contract.

The finding that the use of earnout contracts is not related to the use of escrow contracts is potentially not surprising. These two types of contracts serve different purposes. An important

motive for using an earnout contract is that when a target firm's owner-manager possesses valuable human capital an earnout contract can be used to induce this individual to remain with the newly merged firm after deal completion so that acquisition-related synergies can be maximized. However, escrow contracts are not used for this purpose. Also, while both earnout and escrow contracts help to reduce contracting problems resulting from information asymmetry between buyers and sellers in acquisition deals, earnout contracts are generally used to increase acquisition-related synergies and raise a bidder's upside return from an acquisition. On the other hand, the main purpose of escrow contracts is to provide bidders with recourse in the event of seller breaches of representations and warranties made to the bidder in the acquisition agreement.

Panel B of Table 2 compares the usage of an escrow contract between deals with different characteristics. Consistent with the Panel A results, the percentage of deals using an escrow contract is higher for stock purchase transactions rather than asset sales (60.5% versus 43.5%), deals that are the acquisition of a private stand-alone firm rather than a subsidiary target (65.2% versus 32.1%), deals in which there is a dominant target shareholder (68.5% versus 42.5%), deals using a liability cap (60.3% versus 29.1%), or deals in which the method of payment is only stock (64.7% versus 50.8%). Also, Panel B documents that the percentage of deals using an escrow contract is lower when the method of payment is only cash (45.1% versus 56.1%), but that this percentage does not significantly differ between deals that use or do not use an earnout contract.

Table 3 reports information on the Fama-French 49 industry distribution of the acquirer firms in our sample for the deals with an escrow contract, as well as the industry distribution of the acquirer firms for all the deals in our sample. The two distributions are quite similar, except for the computer software industry, where the percentage of acquirers who include an escrow contract in the acquisition agreement is higher than is the percentage of all the acquirers in our sample operating in this industry (19.1% versus 13.9%). Although not tabulated, we document similar results if we define industry by considering a target's industry and also find that the industry

distribution of targets closely resembles that of acquirers. Overall, the Table 3 results suggest that our study's findings are unlikely to be driven by a few select industries. Nevertheless, to ensure that this is not the case in our multivariate regressions we include industry fixed effects.

IV. Multivariate Results

A. The Determinants of the Use of an Escrow Contract

Table 4 reports the marginal effects results from Probit models examining the determinants of the use of an escrow contract. In these models the dependent variable takes a value of one if an escrow contract is included in the acquisition agreement, and zero otherwise. The first model is estimated using the entire sample of private firm and subsidiary acquisitions, while the second and third models are estimated using only the subsamples consisting of these two types of acquisitions.

Officer (2007) shows that sellers of unlisted targets are often financially constrained and that the discount in the price paid for these targets relative to public targets is accentuated when credit conditions are tight, as measured by the average spread of commercial and industrial loan rates relative to the federal funds rate.[14] Hence, it is possible that credit market conditions can impact how open are the sellers of unlisted targets to including an escrow contract in the acquisition agreement. To control for this issue and also more generally control for changes over time in the extent to which the sellers of unlisted targets may be financially constrained, we include in the Table 4 models the average spread of commercial and industrial loan rates relative to the federal funds rate during the four quarters prior to the quarter of the deal completion date. We also control for deal value given the Table 1 evidence of a negative correlation between whether an escrow contract is used and the size of the target.[15] Finally, we control for year and industry fixed effects

[14] See also Lown, Morgan, and Rohatgi (2000), Harford (2005), and Harford, Klasa, and Maxwell (2014) for discussions about why the spread of average commercial and industrial loan rates relative to the federal funds rate is a valid proxy for the extent to which credit market conditions are tightening.

[15] As discussed earlier, there is not a clear ex-ante prediction for the association between the likelihood that an escrow contract is included in the acquisition agreement and whether the method of payment is only stock or only cash. Although we do not tabulate the results of these analyses, we tried including dummy variables for whether the method of payment is only cash or only stock in the Table 4 models. Irrespective of whether these variables are included

because takeover activity tends to be clustered over time within particular industries (e.g., Mitchell and Mulherin (1996), Harford (2005), and Ahern and Harford (2014)). Controlling for these fixed effects helps to ensure that variation over time and across industries in firms' propensities to engage in acquisitions, which could affect competition between bidders for an unlisted target and consequently the payment method used to pay for the target, do not drive our results.

In subsequent analyses, we use the predicted values from the three models in Table 4 to examine if the use of an escrow contract is associated with the length of time between the preliminary announcement of an acquisition deal and the completion of the deal, the discount in the price paid for an unlisted target relative to the price paid for similar public targets, and bidder firm acquisition announcement returns. As a result, in the Table 4 models we include two variables used as instruments for the likelihood that an escrow contract is used. The first variable is the percentage of deals for unlisted targets in a target's Fama-French 49 industry that used an escrow contract during the previous year (calculated using data from our sample). We predict the higher is this percentage the more likely it is that an escrow contract is included in the acquisition agreement. The second variable is an indicator for if during the prior year the bidder paid for an acquisition using a hybrid method of payment, defined by SDC as a mix of cash and securities in the bidder firm. We expect that bidders that previously used a hybrid method of payment to pay for an acquisition are likely to offer more complex types of payment when making an acquisition, such as including a payment that is placed in an escrow account. Thus, we predict this indicator is positively associated with if an escrow contract is included in the acquisition agreement.

The results for the first model in Table 4 support the prediction that escrow contracts are used to reduce buyers' and sellers' acquisition-related transaction risk. Notably, the results for this model show that the likelihood that an escrow contract is used in the context of a given acquisition

separately or together, the coefficients on these variables are insignificant and the inclusion of these variables in the Table 4 models do not affect any of the other Table 4 results. Also, including these variables in the Table 4 models does not change the results of any of our later analyses that use instrumented values for whether an escrow contract is included in an acquisition agreement.

is higher in instances when it should be more important for buyers and sellers to manage transaction risk. The findings for this model show that if a target is a private firm rather than a subsidiary this increases the likelihood than an escrow contract is used by 22.3%. The results for this model also provide evidence on how the ratio of the size of the target to the acquirer impacts the likelihood that an escrow contract is used in an acquisition transaction. The larger is the value for this ratio, the more important it should be for an acquirer to manage acquisition-related transaction risk. Consistent with this notion, this ratio is positively associated with the probability that an escrow contract is used. An increase from the 25th to the 75th percentile of the ratio of target to bidder size is associated with a 0.6% higher likelihood that an escrow contract is used.

The first model in Table 4 also shows whether when there is greater information asymmetry about the value of a target, if it is more likely that an escrow contract is included in the acquisition agreement. Here, we use five different measures to proxy for information asymmetry between the bidder and sellers about the target's value. Specifically, we consider whether 1) a target operates in an industry in which earnings volatility is higher, 2) the number of distinct analysts covering the publicly traded firms in the target's industry is lower[16], 3) the target operates in a different industry than does the bidder, 4) the target has greater total accruals, as measured by the difference between its earnings and its free cash flows (e.g., Dechow and Dichev (2002))[17], or 5) the target is more likely to be financially distressed, as measured by a lower interest coverage ratio.[18,19] We

[16] We assume that if there are fewer distinct analysts covering the publicly traded firms in an industry this makes it more difficult to value unlisted targets in the industry, which in turn leads to larger information asymmetry about these targets.

[17] Prior work argues that if a firm has large accruals and it is difficult to map its accruals into its future cash flows then it is difficult for investors to infer the firm's financial performance and value from its earnings. For private firm or subsidiary targets, it should be difficult for the bidder to map accruals into future cash flows given that this would require the bidder to study the financial statements of the target over a significant period.

[18] We use a target's interest coverage ratio rather than its debt ratio to proxy for the likelihood that the target is financially distressed because the data from Pratt's Statistics database enables us to calculate only the former. Further, prior work such as Berens and Cuny (1995) and Andrade and Kaplan (1998) suggests that a firm's interest coverage ratio can more reliably proxy for whether it is financially distressed that can its debt ratio.

[19] As reported in the legend to Table 1, Panel B, if a target has no interest expense we arbitrarily set its interest expense to $1,000 to calculate a value for the target for the interest coverage ratio. Doing so allows us to avoid dropping observations in which a target has no debt from the Table 4 analyses and biasing our sample towards it consisting of targets that are unlikely to be financially distressed. To ensure that doing this does not somehow affect the study's

find evidence that strongly supports the notion that when there is more information asymmetry about the target's value, this increases the likelihood that an escrow contract is used. Specifically, the results for the first model in Table 4 show that this likelihood is positively associated with the indicator variables for if earnings volatility in the target's four-digit SIC industry is in the top sample quintile, if analyst coverage of the publicly traded firms in a target's four-digit SIC industry is not in the top sample quintile, and if the target operates in a different four-digit SIC industry than does the bidder.[20] Also, we find that the likelihood an escrow contract is used is positively associated with a target's accruals and negatively associated with its interest coverage ratio. These results are for the most part economically important. Specifically, if a target operates in an industry with higher earnings volatility, lower analyst coverage, or its four-digit SIC industry is different than is the bidder's four-digit SIC industry this leads to, respectively, 0.9%, 3.8%, or 1.6% increases in the probability that an escrow contract is used. Likewise, an increase from the 25th to the 75th percentile value of total accruals or the interest coverage ratio would result respectively in 3.7% or -0.2% changes in the probability that an escrow contract is used.

The first model in Table 4 also shows if an acquisition is an asset sale whether this decreases the likelihood that an escrow contract is used. This could potentially be the case because, as discussed earlier, bidders do not assume target liabilities in asset sales, which reduces bidder transaction risk. Although we find that if an acquisition is an asset sale is indeed negatively associated with the use of an escrow contract, this association is not statistically significant.

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results, we first re-estimate the three models in Table 4 after dropping observations in which a target has no interest expense. All of the independent variables in these models with significant coefficients retain their significant coefficients. Also, using the instrumented values calculated from re-estimating these three models we re-estimate all the subsequent models in the paper that utilize these instrumented values and find that the results of those analyses are unchanged. Second, we re-estimate the three models in Table 4 after dropping the interest coverage variable. Here again, we find that this does not affect any of the Table 4 results or the results of analyses that use the instrumented values calculated from the three Table 4 models.

[20] For the low analyst coverage indicator variable, we consider whether analyst coverage of a target's industry is in the bottom four quintiles of the distribution of this variable rather than the bottom quintile of this distribution because for 42% of the targets in our sample there are no analysts covering the firms in a target's four-digit SIC industry. This relatively high percentage is in part due to a number of these industries having no firms that are publicly traded.

The results for the first model in Table 4 support the prediction that a motive for escrow contracts is that they are used to reduce a dominant shareholder's acquisition-related transaction risk. Specifically, we find that the presence of a dominant target shareholder increases the probability that an escrow contract is used by 16.1%. The results for this model also document that if a bidder agrees to a cap on the amount it could sue the sellers for subsequent to the acquisition this increases the likelihood that an escrow contract is used by 26.7%. This finding supports the proposition that if a bidder agrees to such a cap this makes it easier to convince the sellers of the target to agree to the use of an escrow contract. [21]

Finally, in the first model of Table 4 we find significant positive coefficients on the variable measuring the percentage of deals for unlisted targets in a target's industry that used an escrow contract during the previous year and the indicator variable for whether during the prior year the bidder used a hybrid method of payment to pay for an acquisition. These findings suggest that these two variables are useful instruments for the likelihood that an escrow contract is included in an acquisition agreement. In Section IV.B we report the results of diagnostic tests for the suitability of these two instruments, which confirm the validity of the two instruments.

The results for the second model in Table 4, which is estimated on only the subsample consisting of stand-alone private firm targets, show that all six of the variables in the first model that proxy for bidder acquisition-related transaction risk and that have significant coefficients retain their significant coefficients. Further, the coefficients on the indicator variables for the existence of a target firm dominant shareholder and the use of a liability cap, which are related to seller-side acquisition-related transaction risk, also remain significant in the second model. The results for the third model, which is estimated on only the subsample consisting of subsidiary

[21] It is also possible that within deals that use an escrow contract the fraction of the sale proceeds held in the escrow account is associated with buyer or seller acquisition-related transaction risk. To examine this issue, for the subsample of 491 deals in which an escrow contract is used, we re-estimated the first model from Table 4 using the OLS procedure and replacing the dependent variable in this model with the fraction of the sale proceeds held in the escrow account. We find that most of the proxy variables for bidder and seller acquisition-related transaction risk retain significant coefficients with expected signs.

targets, document that the coefficients on the indicator variables for the existence of a target firm dominant shareholder and the use of a liability cap in the acquisition agreement remain significant. However, the results for this model show that only two of the six variables in the first model that proxy for bidder acquisition-related transaction risk and have significant coefficients retain their significant coefficients when just subsidiary acquisitions are considered.

A likely explanation for why there is stronger support for stand-alone private firm than for subsidiary targets that escrow contracts are used to manage bidder acquisition-related transaction risk is that, as discussed earlier, in acquisitions of private firm targets this risk is larger and it is thus more important for bidders to manage this risk. On the other hand, we expect that in private firm and subsidiary target acquisitions the use of an escrow contract is related to the same extent to seller-side acquisition-related transaction risk, and the Table 4 results support this proposition.

B. Results of Diagnostic Tests for the Suitability of Instruments

From the Table 4 models, we calculate predicted values for the likelihood an escrow contract is included in an acquisition agreement. Next, in Tables 5-7 we use these instrumented values in two-stage least squares (2SLS) analyses that examine the impact of the use of an escrow contract on the length of time between the preliminary announcement of an acquisition deal and the completion of the deal (Table 5), the discount in the price paid for private stand-alone firm and subsidiary targets (Table 6), and bidder acquisition announcement returns (Table 7). To determine the validity of our 2SLS analyses, we perform diagnostic tests to examine the suitability (i.e., relevance) of the instruments used for these analyses and the appropriateness (i.e., exclusivity) of using an instrumental variables approach.

The results of these tests are as follows. First, the results of an F-test of excluded instruments and a partial R-squared test for the first-stage regressions indicate that the instruments in our first-stage models are jointly significant in explaining if an escrow contract is included in a

given acquisition agreement.[22] Second, the results of the Anderson (1951) canonical correlation likelihood ratio test reject the hypothesis that our 2SLS analyses suffer from weak instrument problems.[23] Next, in order to verify the exclusivity of our instruments (i.e., if the effect of our instruments onto the endogenous channel is confined to the first stage equation alone), we ran a Sargan test of over-identifying restrictions and found that the second-stage regressions do not suffer from over-identification problems, meaning that our instruments are exclusive.[24] Based on these tests, we conclude that our instruments are both (i) relevant and (ii) exclusive.

C. Escrow Contracts and Bidder Due Diligence Costs

In acquisitions of private firm and subsidiary targets the larger asymmetric information problems between buyers and sellers about the target's value often results in a bidder incurring due diligence costs that are quite large relative to the value of the target. However, because the use of an escrow contract would reduce a bidder's costs if after the acquisition it is found that negative information about the target was withheld from the bidder, the inclusion of such a contract in an acquisition agreement should reduce a bidder's need to incur very high due diligence costs when acquiring an unlisted target. As a result, the use of escrow contracts in acquisitions of unlisted targets is expected to lead to a creation of real value.[25]

To investigate whether the use of escrow contracts indeed lowers bidder due diligence costs in private firm and subsidiary acquisition deals, we run tests in which we proxy for these costs with the length of the negotiation period between the announcement of a preliminary acquisition

[22] The F-test is based on the F-statistic of excluded instruments and tests the joint significance of all excluded instruments in the first-stage regressions. The partial R-squared is the fraction of the variation of the instrumented variable explained by the instruments, net of their effect through the exogenous variables.
[23] The Anderson (1951) canonical correlation likelihood ratio statistic examines the null hypothesis of under-identification using the canonical correlation between the regressors and their instruments.
[24] The test of over-identifying restrictions tests the joint null hypothesis that the instruments are uncorrelated with the error term and are hence correctly excluded from the second-stage equations.
[25] In his discussion of due diligence costs, Bruner (2004) reports that the due diligence process has many facets and includes among others the following elements (legal issues, tax issues, information technology, risk and insurance issues, environmental issues, market presence and sale issues, operations, real and personal property issues, intellectual and intangible assets, finance, cross-border-issues, and organization and human resources).

agreement and the completion of the deal. In doing so, we follow Marquardt and Zur (2014), Amel-Zadeh and Zhang (2014), and Wangerin (2015) and assume that if a bidder conducts less due diligence on the target this reduces the length of this period. We note that prior to the signing of the preliminary acquisition agreement the sellers of a target will usually provide a bidder with only a small amount of private information about the target, and as a result, it would be difficult for the bidder to begin extensive due diligence on the target. On the other hand, after this agreement is signed the sellers of the target are contractually obligated to provide the bidder with large-scale access to private information about the target. Consequently, it is only after this agreement is signed that the bidder can begin conducting major due diligence on the target.

Table 5 provides the results of our tests of if the time-to-completion of acquisition deals, defined as the number of days between the announcement of a preliminary deal and its closing, is related to the use of an escrow contract.[26] The models we use in Table 5 include as controls the independent variables from the Table 4 models, but exclude the two instrument variables.

The first model in Table 5 shows that, as expected, the time-to-completion of an acquisition deal is negatively associated with whether an escrow contract is included in the acquisition agreement. The coefficient estimate on the escrow agreement indicator variable indicates that the use of an escrow contract is associated with a 20.4 day reduction in the time-to-completion of an acquisition deal. Relative to the mean value for our sample for the time-to-completion for a deal of 57.5 days, this represents a 35.5% decrease in the typical time-to-completion of a deal.

In the second model we attempt to control for the potential endogeneity of whether an escrow contract is used in a particular acquisition deal by replacing the escrow agreement indicator variable with the instrumented escrow agreement indicator calculated from the first model in Table 4. Here also, we document a negative effect of the use of an escrow contract on the time-to-

[26] In 10.7% percent of the observations in our sample the time-to-completion of an acquisition deal is zero days. Our results are very similar if we drop these observations.

completion of a deal. The results for the third and fifth models of Table 5 show that if we focus on private stand-alone firm or subsidiary acquisitions we find that the use of an escrow contract reduces the time-to-completion of both of these types of acquisitions. Further, in the fourth and sixth models of Table 5 we replace the escrow agreement indicator with the instrumented escrow agreement indicators calculated from the second and third models in Table 4 (for only private firm or subsidiary acquisitions), and document that the findings for only private firm or subsidiary acquisitions are robust to accounting for the endogeneity of using an escrow contract. Overall, the Table 5 results are supportive of the proposition that the use of escrow contracts reduce bidders' due diligence costs in acquisitions of unlisted targets, and that consequently, the use of these contracts ought to lead to a creation of real value in these acquisitions.[27]

D. Escrow Contracts and the Discount in the Price Paid for an Unlisted Target

Officer (2007) shows that unlisted targets are typically sold at discounts of about 17% to 30% relative to the price paid for comparable publicly traded targets. If the use of an escrow contract results in a creation of real value because it reduces a bidder's acquisition-related costs, such as the bidder's due diligence costs, and the bidder passes on to the sellers some of this created value then we should observe that the use of an escrow contract has a positive effect on the final total proceeds received by the sellers of an unlisted target.[28] Table 6, Panel A provides evidence on if the use of an escrow contract is associated with a reduction in the discount in the price paid

[27] Another reason why the use of escrow contracts in acquisitions of unlisted targets could lead to real value creation is that they can allow a bidder to avoid having to sue seller parties subsequent to the acquisition if they fail to meet specific terms of the acquisition agreement. Such lawsuits can result in a bidder incurring significant financial and time costs. To provide some insights on this issue, we ran tests using the SDC variable LIT, which provides information on whether one of the players in an acquisition launches litigation as a result of the acquisition. (The SDC database does not provide specific information on whether a bidder sues the sellers of a target subsequent to an acquisition.) In 46% of the deals in our sample, we find that one of the players involved in the deal launches litigation. We estimate linear probability models that are the same as the models in Table 5 except that the dependent variable equals one if one of the players in the acquisition launches litigation, and zero otherwise. We find that the existence of an escrow contract is associated with an 8.3% lower likelihood of deal litigation. We also find that this result is robust to separately examining private firm or subsidiary targets. Further, the results for all, private firm, and subsidiary target deals are robust to accounting for the potential endogeneity of using an escrow contract.

[28] We note that whether or not, and to what extent a bidder shares the created value with the sellers would depend on the relative bargaining strength of the bidder and seller parties.

for an unlisted target. The first model in this table regresses the discount in the deal-value-to-sales multiple of an unlisted target relative to the deal-value-to-sales multiple of comparable publicly traded targets on an indicator variable for if an escrow contract is included in the acquisition agreement. The second model in this table accounts for the potential endogeneity in the decision to use an escrow contract by replacing the indicator variable for whether an escrow contract is used with the fitted value calculated from the first model in Table 4.

In the Table 6, Panel A models we control for the following deal characteristics which are related to acquirer acquisition-related transaction risk, whether a target is a stand-alone private firm, whether a deal is an asset sale, and the relative size of the target to the acquirer. To further control for asymmetric information about the value of the target, we also include indicator variables for if the target operates in an industry with high earnings volatility or with low analyst coverage, or if the target is in a different industry than is the acquirer. To partly control for the issue that the sellers of unlisted targets could have urgent liquidity needs and that these needs can affect the discount in the price paid for an unlisted target (e.g., Officer (2007)), we include as an independent variable whether the method of payment is cash only. Also, because Officer (2007) shows that discounts for unlisted targets are larger when credit conditions are tighter, we control for the average spread of commercial and industrial loan rates relative to the federal funds rate during the four quarters prior to the quarter of the deal completion date.[29] Finally, as in our prior multivariate analyses, we control for deal value and year and industry fixed effects.

The coefficient on the escrow agreement indicator variable in first model in Table 6, Panel A is significant and positive. The coefficient of 0.084 suggests that, on average, the discount in the deal-value-to-sales multiple for an unlisted target relative to the median deal-value-to-sales multiple of comparable public targets is reduced by 8.4% through the use of an escrow contract.

[29] We do not include a control variable in the Table 6, Panel A models for whether the seller of an unlisted target is financially constrained that is constructed using data about the seller because this data is not available for acquisitions of stand-alone private firms. Also, as previously noted, in the majority of the deals for subsidiary targets the parent firm of the subsidiary is a privately held firm and consequently it would not be included in the Compustat database.

For instance, for the typical unlisted target in our sample that has a discount in its deal-value-to-sales multiple of 24.3%, the use of an escrow contract would reduce this discount to 15.9%.

Because when an escrow contract is used the bidder might ultimately keep some of the escrow account funds, we also provide an economic interpretation of the reversal of the unlisted target price discount resulting from the use of an escrow contract after accounting for this possibility. From bidders' public disclosures it is not possible to determine the fraction of the escrow account funds that are returned to the seller parties. However, the escrow services division of J.P. Morgan Chase reported to us that in the context of escrow contracts used in acquisitions of unlisted targets, on average, 60% of the escrow account funds are returned to the sellers. In Panel A of Table 1, we document that for the 491 deals in our sample with an escrow contract that, on average, 12.2% of the sale proceeds are deposited into an escrow account. Thus, based on the assumption that typically 60% of the escrow account funds are returned to the sellers, we estimate that, on average, among the deals in our sample that use an escrow contract 4.9% (=0.4*12.2%) of the sale proceeds are ultimately kept by the acquiring firm. Given that the coefficient estimate on the escrow indicator variable in Table 6, Panel A suggests that the use of an escrow contract leads to a reversal of the unlisted target discount of approximately 8.4%, this implies that after accounting for funds in the escrow account that are not returned to the sellers that, on average, the use of an escrow contract leads to a reversal in the unlisted target discount of about 3.5%.

In the second model of Table 6, Panel A we address the potential endogeneity of whether an escrow contract is used in a given acquisition deal by replacing the escrow agreement indicator variable with the instrumented escrow agreement indicator calculated from the first model in Table 4. Here also, we find that the use of an escrow contract reduces the discount in the price paid for an unlisted target. The results for the third and fifth models show that if we separately examine private firm or subsidiary acquisitions we find that the use of an escrow contract reduces the discount in the price paid for both of these types of targets. In the fourth and sixth models we

replace the escrow agreement indicator with the instrumented escrow agreement indicators calculated from the second and third models in Table 4, and show that the findings for private firm or subsidiary targets are robust to accounting for the endogeneity of using an escrow contract.

Table 6, Panel B provides evidence on whether the extent to which the use of an escrow contract reduces the discount in the price paid for an unlisted target is larger when the bidder faces larger acquisition-related transaction risk. Specifically, in this panel we report if the effect of using an escrow contract on the price paid for an unlisted target is more pronounced when the target is a stand-alone private firm, the relative size of the target to the bidder is greater, or information asymmetry about the value of the target is larger (as measured by if the target operates in an industry with high earnings volatility or low analyst coverage). To do so, in the first and second models of this panel we include as independent variables the interactions of the indicator variable for whether a target is a private stand-alone firm with the escrow agreement indicator variable and the instrumented escrow agreement indicator variable. Similarly, in the third and fourth models in this panel we include the interactions of the relative size of the target to the bidder with the escrow agreement indicator variable and the instrumented escrow agreement indicator variable, in the fifth and sixth models we include the interactions of the indicator variable for whether earnings volatility in a target's industry is in the top sample quintile with the escrow agreement indicator variable and the instrumented escrow agreement indicator variable, and finally in the seventh and eighth models we include the interactions of the indicator variable for whether analyst coverage of a target's industry is not in the top sample quintile with the escrow agreement indicator variable and the instrumented escrow agreement indicator variable.

The coefficients on the interaction variables in the first to fourth models and the sixth to eighth models of Table 6, Panel B are positive and significant, which implies that the extent to which the use of an escrow contract reduces the discount in the price paid for an unlisted target is larger if a target is a private firm, the relative size of the target to the bidder is greater, or there is

more information asymmetry about the value of the target. Thus, because when bidders face larger acquisition-related transaction risk the use of an escrow contract should lead to bigger reductions to a bidder's due diligence costs, in these cases a bidder would be even more likely to pay a higher acquisition price if an escrow contract is included in the acquisition agreement.

E. Escrow Contracts and Bidder Acquisition Announcement Returns

Next, we investigate whether the use of an escrow contract in the acquisition of an unlisted target leads to more positive market reactions for bidders at the announcement of an acquisition deal. We expect that this should be the case if not all of the cost savings for a bidder from using an escrow contract are passed on to the sellers of the target in the form of a higher acquisition price. Table 7, Panel A provides the results of an examination of this issue. Bidder announcement returns are the (-1, 1) day abnormal return surrounding the acquisition announcement date, calculated using the market model where the estimation window is the (-220, -20) days prior to the acquisition announcement date. The acquisition announcement date is the date of the filing of form DEF 14A for the preliminary acquisition deal. In this filing, it would be reported if an escrow contract is included in the acquisition agreement given that the escrow contract would be noted as part of the price consideration offered in the transaction. Although not tabulated, we find that mean (median) bidder acquisition announcement returns for the full sample and for the subsamples consisting only of private firm targets or of subsidiary targets are, respectively, 3.0% (2.1%), 2.9% (2.2%), and 3.2% (2.0%). The magnitude of these announcement returns is similar to that documented in prior work that has examined bidder announcement returns in acquisitions of private firm and subsidiary targets (e.g., Fuller, Netter, and Stegemoller (2002)).

In the Table 7, Panel A models the dependent variable is the bidder acquisition announcement return. The independent variables in these models are the same as in Table 6, except that we additionally control for whether the method of payment is only stock because prior work shows that in acquisitions of unlisted targets bidder announcement returns tend to be more positive

when the method of payment is only stock (e.g., Chang (1998), Fuller, Netter, and Stegemoller (2002), and Officer, Poulsen, and Stegemoller (2009)). Also, because the dependent variable in the Table 7 models relates to the bidder we control for bidder size rather than deal size.

The results for the first two models in Panel A of Table 7 show that the use of an escrow contract is associated with higher bidder acquisition announcement returns and that this is the case both using OLS and a 2SLS approach that accounts for the potential endogeneity of having an escrow contract in place. These findings are consistent with escrow contracts creating value for bidders by reducing their due diligence costs in acquisitions of private firm and subsidiary targets and with bidders not passing on to the sellers of these targets all of their cost savings in the form of a higher acquisition price.

In the third and fourth models of Panel A of Table 7 we report the results for only private firm targets, while in the fifth and sixth models we report the results for only subsidiary targets. The results for the OLS estimations in the third and fifth models show that irrespective of whether a target is a private firm or subsidiary target that the use of an escrow contract is associated with higher bidder acquisition announcement returns. The findings for the 2SLS estimates in the fourth model document that for acquisitions of private firm targets when we account for the potential endogeneity of having an escrow contract in place that the association between the use of an escrow contract and bidder acquisition announcement returns remains positive and significant. However, for subsidiary targets after accounting for this potential endogeneity although there remains a positive association between the use of an escrow contract and bidder announcement returns this association becomes insignificant at conventional significance levels (t-statistic = 1.57).[30]

[30] The adjusted R-squared values for the fifth and sixth models in Table 7 are negative. This is due to the large number of control variables with insignificant coefficients in these two models. If we rerun these two models including the escrow agreement indicator variables and the only control variable with a significant coefficient (i.e., the indicator for whether the transaction is an asset sale) and year and industry fixed effects the adjusted R-squared values increase to 0.005 and 0.013, and the escrow agreement and asset sale indicator variables retain their significant coefficients. However, we note that for these two models we present the results using the extended list of controls for consistency with what we report for the first four models in Table 7.

In the first to eighth models of Table 7, Panel B we include as independent variables the eight interaction variables used in Table 6, Panel B to provide evidence on whether the extent to which the use of an escrow contract is associated with value creation for a bidder is more pronounced when the bidder faces greater acquisition-related transaction risk. We expect this should be the case because when this risk is greater the reduction in a bidder's due diligence costs from using an escrow contract should be larger. The coefficients on six of the eight interaction variables in the Table 7, Panel B models have positive and significant coefficients, which provides support to the proposition that escrow contracts lead to greater value creation for bidders when they face larger acquisition-related transaction risk.

F. Propensity Matched Score Analysis

A potential concern with the results of our analyses that examine the effect of the use of an escrow contract on the length of the period between the announcement of an acquisition deal and its completion, the discount in the price paid for an unlisted target, and bidder acquisition announcement returns is that our linear controls may not adequately account for differences between deals that include or do not include an escrow contract. An empirical approach to address this concern is to create a propensity score matched sample. Using the first model in Table 4, we predict the propensity score for each of the deals in our sample. We next match each deal with an escrow contract to a deal in our sample without an escrow contract. The match is based on (i) the two targets being in the same two-digit SIC industry and acquired within two years of one another, (ii) the two targets not having a difference in value that is greater than 30 percent, and (iii) the propensity score being closest to the counterpart deal but within 20 percent of the propensity score of the deal including the escrow contract. Allowing for the repeated use of matched deals, yields a sample of 292 observations (the subsample of deals with escrow contracts has 491 observations).

We use a t-test to test for differences in means for the length of the period from the announcement of an acquisition deal to its completion between the sample of deals with an escrow

contract and the matched sample. We find that the mean values are statistically different at the 1% level and that the length of this period is 32% shorter for the deals with an escrow contract than for the matched deals without an escrow contract. Similarly, we test for differences in the discount in the price paid for an unlisted target and find that the mean values are statistically different at the 1% level and that the discount is 11.2% lower for the deals with an escrow contract. Finally, we test for differences in bidder announcement returns between the two samples and find they differ at the 5% level and that they are 1.70% higher for deals with an escrow contract.

G. Why are Escrow Contracts Not Used in More Acquisitions of Unlisted Targets?

Our evidence suggests that the use of an escrow contract reduces a bidder's due diligence costs, and consequently enables sellers of unlisted targets to obtain a higher sales price and increases the extent to which acquisitions of such targets leads to value creation for the bidder. A potential question is why these contracts are only used in about 50 percent of deals involving unlisted targets. Below we discuss several potential reasons for why this is the case.

In some cases sellers who are aware of potential misstatements made to the bidder in the representations and warranties section of the acquisition agreement may prefer to not use an escrow contract. If so, then sellers' preference to not include an escrow contract in the acquisition agreement could, at times, result in bidders having larger concerns about the overall quality of the target and to a larger discount in the price paid for the unlisted target. This scenario would be similar to that discussed in prior work (e.g., Akerlof (1970) and Myers and Majluf (1984)), in which buyers will demand a discount in the price paid for a product if it is difficult to verify the product's quality and they are not offered a warranty for it. Also, under this scenario because the bidder would not be able to reduce its due diligence costs through the use of an escrow contract, this could result in lower bidder acquisition announcement returns.[31]

[31] It is important to point out that the result of a positive association between the use of an escrow contract and bidder acquisition announcement returns does not imply that all bidders should attempt to use an escrow contract when

Another reason why an escrow contract might not be used in the acquisition of an unlisted target is that there could be discord among target shareholders about including an escrow contract in the acquisition agreement. For instance, in some cases a number of smaller target shareholders, whose combined ownership is substantial, could prefer to not include an escrow contract in the acquisition agreement and instead make one or two large shareholders of the target more liable for seller breaches of warranties and representations made to the bidder.[32] Finally, another factor that could result in an escrow contract not being used in the context of a given private firm or subsidiary acquisition is that because at times an important motive for these sales is that the sellers have an urgent need for liquidity (e.g., Officer (2007)), in some cases it could be important for the sellers to have immediate access to the entire sale proceeds. In these instances, an escrow contract could be viewed by the sellers as costly, as it would reduce the liquidity that they seek.

V. Conclusion

Although most acquisitions made by publicly traded companies consist of acquisitions of unlisted targets (i.e., acquisitions of private stand-alone firm and subsidiary targets), our understanding of these types of acquisitions is limited. In this paper, we study escrow contracts included in acquisition agreements. Escrow contracts are widely used in acquisitions of unlisted targets, but are not used in acquisitions of publicly traded targets. These contracts give the bidder the opportunity to lay claim on the funds placed in the escrow account subsequent to the acquisition if the seller fails to meet specific terms of the acquisition agreement or it is found that negative information about the target was hidden from the bidder.

We find that the likelihood an escrow contract is used in the acquisition of an unlisted target is greater when buyer or seller acquisition-related transaction risk is higher. Also, we document

acquiring an unlisted target. Instead, this result merely captures the issue that, on average, those bidders who do use an escrow contract do so efficiently to raise firm value.

[32] We note that this scenario is not inconsistent with the Table 4 finding that, *on average*, the existence of a dominant target shareholder is positively associated with whether an escrow contract is included in the acquisition agreement.

evidence that suggests the inclusion of an escrow contract within an acquisition agreement leads to a creation of real value as it enables the bidder to lower its due diligence costs. Consistent with bidders passing on to the sellers of an unlisted target some, but not all, of this created value, we find that the use of an escrow contract positively impacts the total amount of the proceeds received by the sellers of an unlisted target and the extent to which the acquisition leads to value creation for the bidder. Further, we show that these effects are more pronounced in instances in which bidder acquisition-related transaction risk is greater, and consequently, the reduction in a bidder's due diligence costs from using an escrow contract would be larger.

Overall, our findings provide insights into the process in private firm and subsidiary acquisitions, which make up the majority of aggregate takeover activity, and on how participants in these transactions resolve contracting problems. In doing so, we also shed new light on how the method of payment used in mergers and acquisitions can be a function of buyers and sellers trying to manage acquisition-related transaction risk, and on how in general financial contracts can create real value and resolve problems between contracting parties that arise due to information asymmetry and moral hazard.

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Table 1. Univariate sample statistics
The sample includes 569 acquisitions of stand-alone private companies and 374 subsidiary acquisitions completed between 1994-2009 in the U.S., with a deal value of at least $25 million, in which the acquirer did not have a controlling stake in the target prior to the acquisition, but obtained a 100% stake after the acquisition.

Panel A. Escrow contract and unlisted target price discount characteristics
Details about escrow contracts are hand-collected from bidder firms' 8-K, DEF 14A, 10-Q, and 10-K filings. The escrow contract duration statistics are calculated using data for 341 stand-alone private firm targets and 104 subsidiary targets. Escrow contract duration is the number of months that the escrow contract funds are kept in the escrow account. The unlisted target price discount is defined as the percentage difference between the deal-value-to-sales multiple for an unlisted target and the median such multiple for industry- and size-matched comparable acquisitions of publicly traded targets. The portfolio of comparable acquisitions matched to each unlisted target is all acquisitions of publicly traded targets in the same Fama-French 49 industry as the unlisted target with a deal value within 20% of the deal value of the unlisted target and occurring within the 36-month window centered on the acquisition announcement date of the unlisted target. We do not calculate a value for the unlisted target price discount for deals in which the deal multiple for an unlisted target is more than 100% larger than the median multiple of the portfolio of comparable publicly traded targets. The unlisted target price discount variable is winsorized at the 1% level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, for two-tailed Wilcoxon rank-sum tests to determine whether median values differ between subsamples or two-tailed t-tests to determine whether mean values differ between subsamples.

Escrow contract characteristics for the 491 out of 943 acquisition deals in the sample that include an escrow contract:

	Unlisted targets (491 observations)		**Stand-alone private targets (371 observations)**		**Subsidiary targets (120 observations)**	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Percent of sale proceeds deposited in escrow account	12.2	9.3	13.0	9.9	8.9***	7.7**
Escrow contract size (millions of $)	11.7	6.0	11.9	6.0	11.0	5.9
Escrow contract duration (months)	17.4	15.0	17.5	15.0	17.1*	15.0

Unlisted target price discount characteristics for the 931 acquisition deals with necessary data to calculate the price discount measure:

	Unlisted targets (931 observations)		**Stand-alone private targets (557 observations)**		**Subsidiary targets (374 observations)**	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Unlisted target price discount	-0.243	-0.361	-0.171	-0.316	-0.333***	-0.447***

	Unlisted targets with an escrow contract (481 observations)		**Unlisted targets without an escrow contract (450 observations)**	
	Mean	*Median*	*Mean*	*Median*
Unlisted target price discount	-0.196	-0.312	-0.289***	-0.396***

Table 1. Panel B. Target financial characteristics

Deal value is the price paid for the target plus the amount of any assumed liabilities of the target. Relative size of target to acquirer is the ratio of deal value to market value of assets of the acquirer. Target interest coverage is the ratio of operating income before depreciation to interest expense for the target and it is set to zero for targets with negative operating income. In order to avoid dropping observations when a target has no interest expense from the Table 4 multivariate analyses, if a target has no interest expense its interest expense is arbitrarily set to $1,000. The statistics for target return on assets and target interest coverage are calculated using data for, respectively, 909 and 930 observations. The relative size of target to acquirer, target return on assets, and target interest coverage variables are winsorized at the 1% level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, for two-tailed Wilcoxon rank-sum tests to determine whether medians differ between deals with or without escrow contracts or two-tailed t-tests to determine whether mean values differ between deals with or without escrow contracts.

	Unlisted targets (943 observations)		**Unlisted targets with an escrow contract (491 observations)**		**Unlisted targets without an escrow contract (452 observations)**	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Target net sales (millions of $)	42.9	48.7	32.7	38.4	57.6***	63.7***
Target book assets (millions of $)	33.1	32.2	23.4	24.6	48.9***	43.9***
Deal value (millions of $)	93.8	73.0	82.8	68.1	107.5***	80.0***
Relative size of target to acquirer	24.8%	18.4%	24.6%	17.8%	24.9%	18.9%*
Target return on assets	0.049	0.040	0.034	0.035	0.066***	0.040*
Target interest coverage	76.39	2.90	47.30	1.93	108.51***	3.89***

Table 2. Univariate relations between the use of an escrow contract and other deal characteristics
This table reports evidence on univariate relations between whether an escrow contract is included within an acquisition agreement and other deal characteristics.

Panel A. Comparison of other deal characteristics between deals with or without an escrow contract
A stock (asset) purchase transaction includes (does not include) the assumption of target liabilities. A dominant target shareholder is a target shareholder who owns at least 20% of the target's shares, but not all of its shares. A liability cap puts a cap on the amount that the bidder could sue the sellers for subsequent to the acquisition due to breaches of the representations and warranties in the acquisition agreement. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, for chi-square tests corrected for continuity to determine whether proportions differ between deals with or without escrow contracts.

	Unlisted targets (943 observations)	**Unlisted targets with an escrow contract (491 observations)**	**Unlisted targets without an escrow contract (452 observations)**
Percent of deals that are stock purchase transactions	73.7%	80.0%	66.8%***
Percent of deals that are asset purchase transactions	26.3%	20.0%	33.2%***
Percent of deals for stand-alone private firm targets	60.3%	75.6%	43.8%***
Percent of deals for subsidiary targets	39.7%	24.4%	56.2%***
Percent of deals with a dominant target shareholder	36.8%	48.3%	24.1%***
Percent of deals with a liability cap	73.7%	85.3%	61.1%***
Percent of deals where payment is only stock	9.0%	11.2%	6.6%***
Percent of deals where payment is only cash	36.7%	31.8%	42.0%***
Percent of deals with an earnout contract	12.2%	13.8%	10.4%

Panel B. Comparison of the use of an escrow contract between deals with or without a particular deal characteristic
***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, for chi-square tests corrected for continuity to determine whether proportions differ between deals with or without a particular deal characteristic.

	Percent of deals with characteristic in row that include an escrow contract	**Percent of deals without characteristic in row that include an escrow contract**
Stock purchase transaction	60.5%	43.5%***
Stand-alone private firm target	65.2%	32.1%***
Dominant target shareholder	68.5%	42.5%***
Use of a liability cap	60.3%	29.1%***
Payment is only stock	64.7%	50.8%**
Payment is only cash	45.1%	56.1%***
Use of an earnout contract	59.1%	52.1%

Table 3. Industry distribution of deals using escrow contracts and of all deals in the sample
This table reports the industry distribution of the deals in our sample that use an escrow contract and also the industry distribution of all the deals in our sample. Industry is defined as the acquirer's industry. Percentage values are reported.

Acquirer FF Ind. Code	Fama-French 49 industry name	Industry distribution of deals in the sample that use an escrow contract	Industry distribution of all deals in the sample
1	Agriculture	0.2	0.5
2	Food products	0.8	1.0
3	Candy and soda	0.2	0.1
4	Beer and liquor	0.0	0.1
5	Tobacco products	0.0	0.0
6	Toys and recreation	0.2	0.6
7	Entertainment	1.0	1.1
8	Printing and publishing	2.1	2.0
9	Consumer goods	0.8	1.1
10	Clothing and apparel	1.4	1.5
11	Healthcare	3.9	3.0
12	Medical equipment	3.5	3.0
13	Pharmaceutical products	3.7	4.9
14	Chemicals	0.8	1.4
15	Rubber and plastic products	1.0	1.3
16	Textiles	0.0	0.2
17	Construction materials	0.8	1.6
18	Construction	2.7	2.4
19	Steel works	1.7	1.4
20	Fabricated products	0.0	0.0
21	Machinery	2.9	2.2
22	Electrical equipment	1.4	1.9
23	Automobiles and trucks	1.2	1.1
24	Aircraft	1.0	0.9
25	Shipbuilding and railroad equipment	0.6	0.4
26	Defense	0.8	0.4
27	Precious metals	0.0	0.2
28	Non-metallic and industrial metal mining	0.0	0.1
29	Coal	0.2	0.1
30	Petroleum and natural gas	2.3	2.2
31	Utilities	0.2	0.6
32	Telecommunication	3.7	3.5
33	Personal services	1.7	1.2
34	Business services	10.3	10.5
35	Computers	2.9	2.5
36	Computer software	19.1	13.9
37	Electronic equipment	8.0	8.5

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Acquirer FF Ind. Code	Fama-French 49 industry name	Industry distribution of deals in the sample that use an escrow contract	Industry distribution of all deals in the sample
38	Measuring and control equipment	3.7	3.4
39	Business supplies	0.8	0.8
40	Shipping containers	0.0	0.2
41	Transportation	2.1	2.2
42	Wholesale	4.1	4.5
43	Retail	2.5	3.5
44	Restaurants, hotels, and motels	1.2	1.2
45	Banking	0.8	1.2
46	Insurance	0.6	1.5
47	Real estate	0.2	0.3
48	Financial trading	1.9	2.6
49	Other	0.8	1.3

Table 4. The likelihood that an escrow contract is included in an acquisition agreement

This table reports results from Probit models that examine the determinants of the likelihood that an escrow contract is included within an acquisition agreement, in which the dependent variable equals one if an escrow contract is used and zero otherwise. Model (1) is run using the full sample of unlisted target acquisition deals. Model (2) is run using only the acquisition deals for stand-alone private firm targets. Model (3) is run using only the acquisition deals for subsidiary targets. Top quintile target industry earnings volatility indicator is calculated by first determining for each public firm in Compustat the standard deviation of its ROA during the previous five years. Next, we calculate 4-digit SIC code industry-year median values and rank these values into quintiles. Low target industry analyst coverage indicator is calculated by first determining from the IBES dataset what is the number of distinct analysts that cover each 4-digit SIC industry in each year of our sample and then sorting industries into quintiles based on the number of distinct analysts that cover an industry and next coding an indicator variable for whether a target's industry is in the bottom four quintiles for the number of distinct analysts that cover it. Whether the bidder and target operate in different industries is determined using 4-digit SIC codes. Target accruals are calculated as (gross profit - operating profits)/book assets. Commercial and industrial loan rate spread is the average spread of commercial and industrial loan rates over the federal funds rate during the four quarters prior to the quarter of the deal completion date. The percentage of deals in the target's industry that included an escrow contract during the prior year is calculated using a target's Fama-French 49 industry and data from our sample of acquisition deals involving unlisted targets. We are unable to calculate a value for this variable during the first year in our sample period. The indicator variable for if during the prior year the bidder pays for an acquisition using a hybrid method of payment is as defined in SDC. This variable considers whether the bidder paid for an acquisition using a mix of cash and securities in the bidder during the prior year. Fama-French 49 industry (of the acquirer) fixed effects and year fixed effects are included in all the models. All other variables are as previously defined. All continuous variables are winsorized at the 1% level. Marginal effects are reported. The number of observations used for a particular model reflects the type of acquisition that is considered and our ability to construct the variables appearing in the model. T-statistics (in their absolute value) calculated using robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	All unlisted targets (1)	*Stand-alone private firm targets* (2)	*Subsidiary targets* (3)
Target is a stand-alone private firm	0.223***		
	(5.68)		
The acquisition is considered an asset sale	-0.017	-0.030	-0.003
	(0.41)	(0.47)	(0.05)
Relative size of target to acquirer	0.019*	0.021**	0.008
	(1.66)	(2.53)	(1.18)
Top quintile target industry earnings volatility indicator	0.009**	0.086**	0.108
	(2.04)	(2.27)	(1.20)
Low target industry analyst coverage indicator	0.038*	0.043*	0.112**
	(1.79)	(1.87)	(2.12)
Target and acquirer are in different industries	0.016**	0.041***	0.025
	(2.48)	(2.95)	(0.43)
Target accruals	0.542**	0.515*	0.799*
	(2.15)	(1.71)	(1.82)
Target interest coverage (scaled by 1,000)	-0.079*	-0.069**	-0.031
	(1.88)	(2.00)	(1.58)
Indicator for the presence of a target firm dominant shareholder	0.161***	0.125***	0.218***
	(4.51)	(2.95)	(2.75)
Indicator for the use of a liability cap in the acquisition agreement	0.267***	0.312***	0.228***
	(6.97)	(5.53)	(3.70)
Commercial and industrial loan rate spread	-0.005	-0.023	-0.073
	(0.10)	(0.36)	(0.73)
Ln (Deal value)	-0.046***	-0.024	-0.073***
	(2.78)	(1.06)	(2.72)
Instruments			
Percentage of deals in the target's industry that used an escrow contract during the prior year	0.208*	0.426**	0.046
	(1.68)	(2.23)	(1.21)
The bidder uses a hybrid method of payment to pay for an acquisition in the prior year	0.012*	0.010**	0.047**
	(1.92)	(2.08)	(2.48)
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Observations	837	520	317
Pseudo R-squared	0.205	0.278	0.358

Table 5. The existence of an escrow contract and the time-to-completion of acquisition deals

This table presents multivariate analyses of the determinants of the time-to-completion of acquisition deals, defined as the number of days between the announcement of a preliminary acquisition agreement and the completion of the deal. All other variables are as previously defined. All continuous variables are winsorized at the 1% level. Models (1), (3), and (5) show OLS estimates, while Models (2), (4), and (6) show 2SLS estimates, where we instrument the escrow agreement indicator using respectively Models (1), (2), and (3) in Table 4. Fama-French 49 industry (of the acquirer) fixed effects and year fixed effects are included in all the models. The number of observations used for a particular model reflects the type of acquisition that is considered and our ability to construct the variables appearing in the model. T-statistics (in their absolute value) calculated using robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	All unlisted targets		*Stand-alone private firm targets*		*Subsidiary targets*	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Escrow agreement indicator	-20.385***		-18.714*		-24.175**	
	(2.68)		(1.71)		(1.99)	
Instrumented escrow agreement indicator		-53.841**		-40.173**		-21.001**
		(2.57)		(2.58)		(2.36)
Target is a stand-alone private firm	0.740	15.811				
	(0.08)	(0.74)				
The acquisition is considered an asset sale	0.835	0.874	0.097	2.414	10.601	8.838
	(0.08)	(0.08)	(0.01)	(0.15)	(0.91)	(0.70)
Relative size of target to acquirer	3.286	5.677	3.997	6.273	-0.133	-3.071
	(0.55)	(0.91)	(0.47)	(0.72)	(0.01)	(0.31)
Top quintile target industry earnings volatility indicator	6.866**	8.904**	15.416*	18.900**	-11.318	-14.321
	(2.45)	(2.58)	(1.76)	(1.97)	(0.78)	(0.95)
Low target industry analyst coverage indicator	23.361**	28.635***	36.011***	39.560***	0.768	2.102
	(2.32)	(2.77)	(2.87)	(2.75)	(0.05)	(0.12)
Target and acquirer are in different industries	3.714***	0.803	-0.801	0.172	10.641*	1.210
	(2.64)	(1.13)	(0.13)	(0.03)	(1.82)	(0.70)
Target accruals	12.088	25.819	-23.223	-64.083	61.004	31.847
	(0.39)	(0.41)	(0.57)	(1.04)	(1.04)	(0.47)
Target interest coverage (scaled by 1,000)	35.997	40.263	65.249	70.500	0.623	6.413
	(0.91)	(0.89)	(0.91)	(0.93)	(0.06)	(0.42)
Indicator for the presence of a target firm dominant shareholder	-3.554	-2.950	-11.566	-16.647	7.439	-16.441
	(0.54)	(0.18)	(1.38)	(1.19)	(0.53)	(0.90)
Indicator for the use of a liability cap in the acquisition agreement	8.968	18.447	11.587	-10.284	8.842	0.454
	(1.17)	(0.75)	(1.13)	(0.45)	(0.78)	(0.02)
Commercial and industrial loan rate spread	6.572	9.397	27.010**	31.554**	-14.291	-7.426
	(0.73)	(0.92)	(2.13)	(2.14)	(0.98)	(0.42)
Ln (Deal value)	11.238**	8.420	5.916	6.505	21.079***	23.665***
	(2.25)	(1.21)	(1.19)	(1.36)	(3.19)	(2.86)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	884	837	536	520	348	317
Adjusted R-squared	0.086	0.090	0.133	0.132	0.034	0.027

Table 6. Panel A. The existence of an escrow contract and the unlisted target price discount

This table presents multivariate analyses of the determinants of the unlisted target price discount. All variables are as previously defined. All continuous variables are winsorized at the 1% level. Models (1), (3) and (5) show OLS estimates, while Models (2), (4) and (6) show 2SLS estimates, where we instrument the escrow agreement indicator using respectively Models (1), (2), and (3) in Table 4. Fama-French 49 industry (of the acquirer) fixed effects and year fixed effects are included in all the models. The number of observations used for a particular model reflects the type of acquisition that is considered and our ability to construct the variables appearing in the model. T-statistics (in their absolute value) calculated using robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	All unlisted targets		*Stand-alone private firm targets*		*Subsidiary targets*	
	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)
Escrow agreement indicator	0.084**		0.126**		0.044*	
	(2.30)		(2.35)		(1.65)	
Instrumented escrow agreement indicator		0.202***		0.228***		0.139***
		(3.16)		(3.28)		(2.73)
Target is a stand-alone private firm	0.159***	0.197***				
	(4.00)	(3.82)				
The acquisition is considered an asset sale	0.025	0.029	0.121*	0.141**	-0.019	-0.009
	(0.63)	(0.69)	(1.94)	(2.16)	(0.34)	(0.16)
Relative size of target to acquirer	-0.051***	-0.040**	0.012	0.019	-0.093***	-0.069*
	(2.72)	(2.26)	(0.18)	(0.29)	(2.84)	(1.79)
Top quintile target industry earnings volatility indicator	0.121**	0.133**	0.187**	0.177**	0.060	0.062
	(1.99)	(2.15)	(2.10)	(1.97)	(0.67)	(0.62)
Low target industry analyst coverage indicator	-0.133*	-0.130*	-0.066	-0.096	-0.203*	-0.222*
	(1.93)	(1.81)	(0.70)	(1.00)	(1.84)	(1.75)
Target and acquirer are in different industries	0.070*	0.061	0.050	0.039	0.088**	0.056*
	(1.92)	(1.60)	(0.95)	(0.71)	(2.47)	(1.86)
Method of payment is only cash	-0.011	-0.014	-0.038	-0.039	0.028	0.020
	(0.29)	(0.38)	(1.63)	(1.61)	(0.52)	(0.35)
Commercial and industrial loan rate spread	-0.019	-0.019	-0.019	-0.046	-0.013	0.019
	(0.33)	(0.33)	(0.24)	(0.56)	(0.15)	(0.19)
Ln (Deal value)	0.042**	0.039*	0.044	0.039	0.046*	0.060*
	(2.23)	(1.85)	(1.52)	(1.32)	(1.76)	(1.88)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	889	825	530	508	359	317
Adjusted R-squared	0.218	0.226	0.179	0.191	0.225	0.264

Table 6. Panel B. Cross-sectional variation in the association between the existence of an escrow contract and the unlisted target price discount

This table presents multivariate analyses of the determinants of the unlisted target price discount using the full sample of unlisted targets. We include interactions of (i) the escrow agreement indicator and (ii) the instrumented escrow agreement indicator calculated from Model (1) in Table 4 with (a) an indicator for if the target is a stand-alone private firm, or (b) the demeaned relative size of target to acquirer, or (c) if the target's industry has high earnings volatility (as previously defined), or (d) if the target's industry has low analyst coverage (as previously defined). All continuous variables are winsorized at the 1% level. Fama-French 49 industry (of the acquirer) fixed effects and year fixed effects are included in all the models. The number of observations used for a particular model reflects the type of acquisition that is considered and our ability to construct the variables appearing in the model. T-statistics (in their absolute value) calculated using robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Escrow agreement indicator	0.079**		0.066		0.087**		0.089**	
	(2.52)		(1.56)		(2.26)		(2.35)	
Instrumented escrow agreement indicator		0.153*		0.161*		0.150*		0.159
		(1.68)		(1.73)		(1.65)		(1.48)
Target is a stand-alone private firm * escrow agreement indicator	0.011**							
	(2.15)							
Target is a stand-alone private firm * instrumented escrow agreement indicator		0.041**						
		(2.38)						
Demeaned relative size of target to acquirer * escrow agreement indicator			0.041**					
			(2.18)					
Demeaned relative size of target to acquirer * instrumented escrow agreement indicator				0.016*				
				(1.69)				
Top quintile target industry earnings volatility indicator * escrow agreement indicator					0.008			
					(1.09)			
Top quintile target industry earnings volatility indicator * instrumented escrow agreement indicator						0.016*		
						(1.83)		
Low target industry analyst coverage indicator * escrow agreement indicator							0.027**	
							(2.26)	
Low target industry analyst coverage indicator * instrumented escrow agreement indicator								0.044**
								(2.05)

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	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Target is a stand-alone private firm	0.154***	0.282***	0.161***	0.198***	0.159***	0.195***	0.161***	0.194***
	(3.00)	(2.84)	(4.05)	(3.83)	(4.02)	(3.77)	(4.01)	(3.79)
The acquisition is considered an asset sale	0.025	0.030	0.027	0.031	0.025	0.031	0.025	0.027
	(0.63)	(0.72)	(0.67)	(0.74)	(0.63)	(0.73)	(0.62)	(0.65)
Demeaned relative size of target to acquirer	-0.051*	-0.039	-0.065*	-0.109**	-0.051*	-0.041	-0.051*	-0.035
	(1.73)	(1.23)	(1.73)	(2.20)	(1.72)	(1.29)	(1.72)	(1.11)
Top quintile target industry earnings volatility indicator	-0.121**	-0.135**	-0.123**	-0.138**	-0.125*	-0.044	-0.120**	-0.132**
	(2.00)	(2.18)	(2.03)	(2.20)	(1.68)	(0.37)	(1.99)	(2.15)
Low target industry analyst coverage indicator	-0.132*	-0.129*	-0.132*	-0.127*	-0.132*	-0.131*	-0.146*	-0.384***
	(1.91)	(1.80)	(1.91)	(1.77)	(1.92)	(1.84)	(1.70)	(2.71)
Target and acquirer are in different industries	0.071*	0.062	0.071*	0.059	0.071*	0.059	0.071*	0.069*
	(1.93)	(1.63)	(1.93)	(1.55)	(1.94)	(1.55)	(1.94)	(1.84)
Method of payment is only cash	-0.010	-0.014	-0.009	-0.012	-0.010	-0.014	-0.011	-0.011
	(0.28)	(0.36)	(0.26)	(0.30)	(0.28)	(0.37)	(0.29)	(0.28)
Commercial and industrial loan rate spread	-0.019	-0.023	-0.020	-0.016	-0.020	-0.017	-0.020	-0.020
	(0.35)	(0.40)	(0.35)	(0.29)	(0.35)	(0.30)	(0.36)	(0.35)
Ln (Deal value)	0.043**	0.043**	0.043**	0.039*	0.043**	0.041**	0.043**	0.037*
	(2.38)	(2.09)	(2.37)	(1.92)	(2.38)	(2.02)	(2.38)	(1.85)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	889	825	889	825	889	825	889	825
Adjusted R-squared	0.217	0.229	0.218	0.230	0.217	0.228	0.218	0.234

Table 7. Panel A. The existence of an escrow contract and bidder acquisition announcement returns

This table presents multivariate analyses of the determinants of bidder acquisition announcement returns. The dependent variable is the cumulative abnormal announcement return for the acquirer starting -1 and ending +1 trading days around the day of the acquisition deal announcement. All other variables are as previously defined. All continuous variables are winsorized at the 1% level. Models (1), (3) and (5) show OLS estimates, while Models (2), (4) and (6) show 2SLS estimates, where we instrument the escrow agreement indicator using respectively Models (1), (2), and (3) in Table 4. Fama-French 49 industry (of the acquirer) fixed effects and year fixed effects are included in all the models. The number of observations used for a particular model reflects the type of acquisition that is considered and our ability to construct the variables appearing in the model. T-statistics (in their absolute value) calculated using robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	All unlisted targets		*Stand-alone private firm targets*		*Subsidiary targets*	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Escrow agreement indicator	0.014*		0.016**		0.014*	
	(1.92)		(1.96)		(1.80)	
Instrumented escrow agreement indicator		0.033*		0.037**		0.019
		(1.85)		(1.94)		(1.57)
Target is a stand-alone private firm	0.002	-0.008				
	(0.26)	(0.83)				
The acquisition is considered an asset sale	0.006	0.009	-0.015	-0.014	0.023**	0.034**
	(0.79)	(1.09)	(1.34)	(1.01)	(2.13)	(2.81)
Relative size of target to acquirer	0.012	0.020**	0.022*	0.024**	0.005	0.020
	(1.55)	(2.04)	(1.77)	(1.97)	(0.44)	(1.18)
Top quintile target industry earnings volatility indicator	-0.015	-0.017	-0.026*	-0.025*	-0.006	-0.009
	(1.28)	(1.34)	(1.71)	(1.83)	(0.36)	(0.46)
Low target industry analyst coverage indicator	-0.005	-0.001	-0.014	-0.001	-0.004	-0.021
	(0.48)	(0.05)	(0.96)	(0.08)	(0.21)	(0.93)
Target and acquirer are in different industries	-0.006*	-0.009**	-0.010**	-0.012**	-0.001	-0.004
	(1.79)	(2.24)	(2.03)	(2.15)	(1.05)	(1.36)
Method of payment is only cash	0.006	0.001	0.009	0.011	0.002	0.001
	(0.88)	(0.08)	(0.95)	(0.09)	(0.15)	(0.07)
Method of payment is only stock	0.038**	0.041**	0.046**	0.049**	-0.006	-0.020
	(2.29)	(2.33)	(2.38)	(2.51)	(0.01)	(0.57)
Commercial and industrial loan rate spread	0.009	0.015	0.001	0.012	0.015	0.026
	(1.08)	(1.48)	(0.02)	(0.85)	(1.01)	(1.29)
Log(Market value of acquirer assets)	-0.004	-0.006	-0.005	-0.007	-0.002	-0.001
	(1.20)	(1.41)	(0.91)	(1.19)	(0.42)	(0.26)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	844	783	504	483	340	300
Adjusted R-squared	0.019	0.011	0.047	0.040	-0.013	-0.014

Table 7. Panel B. Cross-sectional variation in the association between the existence of an escrow contract and bidder acquisition announcement returns
This table presents multivariate analyses of the determinants of bidder acquisition announcement returns using the full sample of unlisted targets. We include interactions of (i) the escrow agreement indicator and (ii) the instrumented escrow agreement indicator calculated from Model (1) in Table 4 with (a) an indicator for if the target is a stand-alone private firm, or (b) the demeaned relative size of target to acquirer, or (c) if the target's industry has high earnings volatility (as previously defined), or (d) if the target's industry has low analyst coverage (as previously defined). All continuous variables are winsorized at the 1% level. Fama-French 49 industry (of the acquirer) fixed effects and year fixed effects are included in all the models. The number of observations used for a particular model reflects the type of acquisition that is considered and our ability to construct the variables appearing in the model. T-statistics (in their absolute value) calculated using robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Escrow agreement indicator	0.007*		0.009		0.013*		0.011	
	(1.67)		(1.00)		(1.76)		(1.38)	
Instrumented escrow agreement indicator		0.022*		0.025*		0.021*		0.029**
		(1.80)		(1.68)		(1.72)		(1.96)
Target is a stand-alone private firm * escrow agreement indicator	0.012*							
	(1.73)							
Target is a stand-alone private firm * instrumented escrow agreement indicator		0.019*						
		(1.65)						
Demeaned relative size of target to acquirer * escrow agreement indicator			0.009***					
			(2.62)					
Demeaned relative size of target to acquirer * instrumented escrow agreement indicator				0.005*				
				(1.70)				
Top quintile target industry earnings volatility indicator * escrow agreement indicator					0.002**			
					(2.12)			
Top quintile target industry earnings volatility indicator * instrumented escrow agreement indicator						0.024		
						(1.37)		
Low target industry analyst coverage indicator * escrow agreement indicator							0.014*	
							(1.81)	
Low target industry analyst coverage indicator * instrumented escrow agreement indicator								0.018
								(1.16)

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	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)
Target is a stand-alone private firm	0.004	0.002	0.002	-0.007	0.002	-0.007	0.002	-0.008
	(0.43)	(0.12)	(0.28)	(0.70)	(0.25)	(0.70)	(0.22)	(0.76)
The acquisition is considered an asset sale	0.006	0.009	0.006	0.009	0.006	0.008	0.006	0.009
	(0.80)	(1.20)	(0.80)	(1.16)	(0.78)	(0.99)	(0.79)	(1.14)
Demeaned relative size of target to acquirer	0.012	0.021**	0.008	0.002	0.012	0.021**	0.012	0.021**
	(1.55)	(2.07)	(0.84)	(0.13)	(1.55)	(2.12)	(1.51)	(2.13)
Top quintile target industry earnings volatility indicator	-0.015	-0.018	-0.015	-0.018	-0.016	0.026	-0.015	-0.018
	(1.30)	(1.20)	(1.30)	(1.18)	(1.03)	(0.94)	(1.24)	(1.18)
Low target industry analyst coverage indicator	-0.006	-0.002	-0.005	-0.002	-0.005	-0.003	0.003	-0.028
	(0.50)	(0.13)	(0.48)	(0.17)	(0.48)	(0.19)	(0.20)	(0.98)
Target and acquirer are in different industries	-0.006*	-0.009**	-0.006*	-0.009**	-0.005*	-0.009**	-0.005*	-0.009**
	(1.80)	(2.21)	(1.80)	(2.26)	(1.79)	(2.18)	(1.79)	(2.23)
Method of payment is only cash	0.006	0.002	0.006	0.003	0.006	0.002	0.006	0.003
	(0.87)	(0.27)	(0.95)	(0.34)	(0.87)	(0.21)	(0.84)	(0.32)
Method of payment is only stock	0.038**	0.040**	0.038**	0.039**	0.038**	0.039**	0.037**	0.040**
	(2.31)	(2.30)	(2.31)	(2.21)	(2.28)	(2.20)	(2.25)	(2.21)
Commercial and industrial loan rate spread	0.009	0.016	0.009	0.016	0.009	0.015	0.009	0.016
	(1.08)	(1.51)	(1.09)	(1.55)	(1.08)	(1.49)	(1.10)	(1.52)
Log(Market value of acquirer assets)	-0.004	-0.005	-0.004	-0.005	-0.004	-0.006	-0.004	-0.005
	(1.17)	(1.35)	(1.20)	(1.30)	(1.20)	(1.45)	(1.21)	(1.40)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	844	783	844	783	844	783	844	783
Adjusted R-squared	0.018	0.010	0.018	0.013	0.017	0.014	0.018	0.012