Does Hiring M&A Advisers Matter for Private Sellers?

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M&A advisers can find and negotiate better deals for sellers, but hiring them entails fees and potential agency costs. Using a novel, hand-collected dataset on the hiring of seller advisers for a large sample of M&A deals, we find that private sellers use advisers or top-tier advisers when it makes economic sense. After accounting for this selection effect, advisers and top-tier advisers positively affect deal valuations. We find some evidence that acquirers' announcement returns are lower in deals where private sellers use advisers. Our findings suggest that M&A advisers can find and negotiate better deals for private sellers.

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1. Introduction

M&A transactions are outcomes of negotiations between buyers and sellers. In a negotiation, the outcome partly depends on the relative bargaining strengths of the two parties. A party's bargaining strength depends on some factors that are beyond its control and others within its control. In an M&A transaction, hiring an adviser is a step that either side can take to try to increase its bargaining power. While the decision and impact of hiring M&A advisers by acquirers have been examined extensively (see, e.g., McLaughlin, 1992; Servaes and Zenner, 1996; Rau, 2000; Bao and Edmans, 2011; Golubov *et al.*, 2012; Sibilkov and McConnell, 2014; Chemmanur *et al.*, 2019; Wang *et al.*, 2022), to our knowledge, these issues have not been analyzed for target firms.[1] This paper aims to partially fill this gap by investigating the determinants of private sellers' choice of whether to hire M&A advisers (or top-tier advisers) and the effect of this choice on deal valuations. We focus on non-publicly-traded targets (i.e., private sellers) because these issues are particularly important to them for reasons we discuss below.[2] These issues are also important to investors and participants in the M&A advisory market, namely firms contemplating mergers and investment banks (IBs).

We find that a large proportion of private sellers do not hire advisers despite having severe disadvantages in the M&A market relative to public sellers. In our sample of 3,281 acquisitions of private firms during 1993–2010, as many as 1,727 (or about 53%) of the private sellers do not use an adviser. The decision by a large proportion of private sellers to not use advisers is important for several reasons. First, private firms tend to be smaller than public firms, so they are less likely to be familiar with the M&A process and have limited experience in negotiating M&A deals. Servaes and Zenner (1996) find that firms with less prior acquisition experience are more likely to use M&A advisers. Fuller *et al.* (2002) and Officer (2007) suggest that private targets have less bargaining power than public targets. All of this evidence suggests that private targets should use M&A advisers to overcome a negotiating

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[1]Roberts (2009) provides anecdotal evidence of the benefit to private sellers of using M&A advisers, and says, "'The lawyer who represents himself has a fool for a client.' This famous quote also applies, without question, to the sellers of middle market businesses." An opposing view is that of Warren Buffett, the chairman of frequent acquirer Berkshire Hathaway Inc., who is skeptical of the value of IBs' M&A advice (see, e.g., Buffett and Cunningham, 2001, Chap. 5).

[2]Moreover, as we discuss in Sec. 4.1, analyzing the outcomes for private targets requires a completely different methodology than that for public targets due to the non-existence of stock prices for the former. This fact also makes it challenging to analyze both private and public targets without ballooning the length of the paper.

disadvantage with bidders, which tend to be larger and have more M&A experience. Second, the paucity of public information about private companies means that potential acquirers face greater information asymmetry when evaluating private sellers, leading to lower valuations. Advisers can use their reputational capital to certify the quality of private targets (see, e.g., Campbell and Kracaw, 1980; Booth and Smith, 986). By reducing information asymmetry between bidders and private sellers, sell-side advisers can create significant value for their clients.

Third, M&A advisers have information resources and business relationships that they can use to find more potential bidders for private sellers, which tend to be less visible than public companies because they receive less attention from investors, analysts and the news media. Less visible firms are likely to receive fewer competing bids, potentially limiting their bargaining power in deal negotiations. Advisers can produce relevant information about targets, use their networks to identify potential acquirers and synergy gains to them, and help negotiate transactions for private targets (see Chemmanur and Fulghieri, 1994). IBs with high reputation can also generate higher valuations for their client firms through their market power (see Chemmanur and Krishnan, 2012). Golubov et al., 2012 find that bidder advisers' ability to secure a greater share of synergies for bidders is hampered by top-tier target adviser. Finally, advisers can facilitate timely information transfer between the target and acquirer firms (Welch, 1992).

But hiring an adviser also entails costs. First, the seller incurs the direct cost of hiring the adviser, namely the adviser's fee. The seller may need to pay more for top-tier advisers, as suggested by Chemmanur and Fulghieri's (1994) model that more reputable IBs provide higher-quality services and charge higher fees. Second, the seller also potentially faces an agency cost that arises from differences in the interests of the seller and the agent. On the net, does hiring an adviser benefit the seller? In addition, does hiring a high-reputation adviser benefit the seller more? These are ultimately empirical issues that we analyze in this paper.

We examine a sample of 3,281 acquisitions of private sellers during the period 1993–2010 to examine the decision and consequences of hiring sell-side M&A advisers. As discussed in Sec. 4, SDC does not report the seller as having used an adviser in 1,918 (i.e., about 58%) of these deals. Because the proportion of deals without a sell-side adviser, as reported by SDC, seems quite large and the presence or absence of a sell-side adviser is a key variable in our study, we manually cross-check this data from two other sources: Lexis-Nexis and Capital IQ. We find a sell-side adviser reported in an

additional 191 deals from these other sources, for a total of 1,554 deals with advisers and the remaining 1,727 without advisers. We start by identifying factors that affect the decision of private sellers to use M&A advisers and top-tier advisers. We then examine whether deal valuations are higher, on average, for private sellers that use advisers than for those that do not, and whether private sellers tend to benefit more from hiring top-tier advisers rather than lower-tier advisers. We next examine whether top-tier advisers charge private sellers higher fees than do lower-tier advisers. Finally, we investigate whether private sellers' use of advisers affects acquirers' announcement returns.

We find that private sellers choose to use advisers or top-tier advisers when the potential valuation benefit from hiring an adviser is greater. For example, larger private sellers are more likely to retain advisers and choose top-tier advisers. This result is consistent with the notions that sellers have more at stake in larger deals and that financial advice is more valuable in more complex deals. We find that private sellers are more likely to use advisers (top-tier advisers) when acquirers use advisers (top-tier advisers). This result is consistent with Kale *et al.*'s (2003) finding that the relative reputation of advisers on the buy-side and sell-side matters to buyers due to the bargaining involved in M&A deals. We find that private sellers that are subsidiaries or are headquartered in states different from their acquirers are more likely to hire advisers or top-tier advisers. These results are consistent with prior studies that find that information asymmetry about seller valuations is more severe in deals involving subsidiaries due to limited public information about them (see Officer, 2007) and higher costs of obtaining information for more distant buyers and sellers (see Uysal *et al.*, 2008).

An obvious concern with our analysis is private sellers' endogenous choice of using M&A advisers or top-tier advisers. Another concern involves potentially omitted variables. While identification concerns are generally difficult to completely rule out, we mitigate them by using several different methodologies: (1) two-stage least squares (2SLS), (2) Heckman's (1979) treatment effect model, (3) endogenous switching regressions, (4) Abadie and Imbens (2006) matching (AIM), and (5) propensity score matching (PSM). The first approach deals with omitted variables. The next two approaches correct for selection bias based on unobservable variables. The last two approaches deal with selection bias based on observables. The first three methods are regression-based and use instruments for identification. In addition, the second and third methods also make use of the nonlinearity of the first-stage regression for identification (see, e.g., Li and Prabhala, 2007, Sec. 2.3.1). The last two approaches are matching methods that don't require instruments.

We use the prevalence of sell-side M&A advisers (top-tier advisers) in the seller's industry and the seller's geographic proximity to financial advisers as instruments for the decision to use M&A advisers (top-tier advisers).[3] We discuss the choice and justification of the instruments in Sec. 6.2.1.

We find that private sellers receive significantly higher acquisition premiums when they retain advisers. Our estimates of the magnitude of this effect range from about 6% under matching methods to about 25% in treatment effect or switching regressions. However, these estimates do not account for the adviser fee. Limited availability and voluntary reporting of adviser fee data preclude conclusions on the *net* benefit of hiring advisers for private sellers. Among private sellers that hire advisers, we find that hiring top-tier advisers lead to higher acquisition premiums to sellers. Finally, we find some evidence that the announcement returns of acquirers are significantly lower in deals where private sellers use M&A advisers, consistent with the idea that, on average, advisers increase the bargaining power of private sellers. Our estimate of the magnitude of this effect is about -7% in the treatment effect regression.

A related issue is whether private sellers that do not hire advisers are sophisticated sellers for whom M&A advice from IBs is less valuable. Such sellers may have prior experience with M&A deals as acquirers or may be backed by a venture capital, private equity or hedge fund sponsor. However, the proportion of such sophisticated sellers in our subsample of deals where private sellers do not hire M&A advisers is too small (22 out of 1,727) to permit meaningful empirical analysis. Not surprisingly, in untabulated results, when we control for a dummy variable for the sophisticated seller in our regressions of the choice to hire an adviser and of deal valuations, the coefficient of this variable is statistically insignificant in all cases. More importantly, our main results remain virtually unchanged by the addition of this control.

Even though acquisitions of private sellers are far more prevalent than deals involving public sellers, relatively few studies analyze acquisitions of private firms.[4] We provide new evidence that financial advisers improve

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[3] We also use a 3-stage procedure, where we use the predicted probability of using an M&A adviser (or a top-tier adviser) from a probit model as an additional instrument in the 2SLS regressions. Using this nonlinear fitted value as an instrument (i.e., generated IV) provides a "back-door" identification (see, e.g., Angrist and Pischke, 2009). Since results from the 2SLS and generated IV approaches are qualitatively similar, we do not tabulate the latter.

[4] See, e.g., Officer (2007). Almost two-thirds of M&A deals reported by the Securities Data Corporation (SDC) are acquisitions of private sellers (see, e.g., Netter *et al.*, 2011).

M&A outcomes for sellers that are more likely to lack deal-making experience and negotiating skills and hence can benefit from M&A adviser expertise. By examining how hiring sell-side advisers affects deal outcomes for sellers, our paper complements the literature on the choice and impact of using buy-side advisers (see, e.g., McLaughlin, 1992; Servaes and Zenner, 1996; Rau, 2000; Golubov *et al.*, 2012; Chemmanur *et al.*, 2019; Wang *et al.*, 2022). Our findings also complement those of De Franco *et al.* (2011), who find that private company sellers that use a Big 4 auditor receive higher valuation multiples. Finally, our findings should also be of interest to owners of private companies, IBs, legal advisers, and other participants in the M&A market.

The paper is organized as follows: Sec. 2 reviews the related literature. Section 3 discusses the role of sell-side M&A advisers. Section 4 describes the sample. Section 5 presents descriptive statistics. Section 6 discusses our empirical models and results, and Sec. 7 concludes.

2. Prior Studies

2.1. *Acquisitions of private sellers*

Private firms are sold, on average, at significant valuation discounts (of about 15–30%) relative to public sellers in the M&A market (see, e.g., Officer, 2007; Lian and Wang, 2012). Previous studies find that bargaining power is a significant determinant of the magnitude of private valuation discounts (see Fuller *et al.*, 2002; Officer, 2007; Golubov *et al.*, 2012; Chemmanur *et al.*, 2019). A key positive determinant of a seller's bargaining power is the number of competing bids it receives. Public companies receive more bids than comparable private sellers for several reasons. First, regular SEC filings allow potential bidders to obtain information about public companies that they may be interested in acquiring without incurring significant costs. Second, public companies tend to have greater visibility and media exposure relative to private firms, increasing the probability that they would attract the attention of potential bidders. Third, a public company receiving an initial takeover bid via a tender offer is required to publicly disclose it. The disclosure is followed by a waiting period imposed by the Williams Act of 1968 to provide opportunities for potential buyers to submit competing bids.

2.2. *The effect of hiring buy-side M&A advisers*

Advisers can provide valuable advisory services to acquirers and sellers during the M&A process. Theory suggests that experienced and more

reputable advisers should be more effective and improve deal outcomes through information production (see Booth and Smith, 1986; Chemmanur and Fulghieri, 1994). In addition, advisers can facilitate timely information transfer between the two parties (Welch, 1992). Empirical evidence on this issue is mixed. Early studies find that hiring more reputable buy-side advisers does not result in higher announcement returns on acquirer stocks (see, e.g., McLaughlin, 1992; Servaes and Zenner, 1996; Rau, 2000). But more recent studies find a positive relation between the announcement returns of acquirers and the reputations of their advisers (see Golubov *et al.*, 2012; Bao and Edmans, 2011). Golubov *et al.* (2012) find such a relation in deals involving public, but not private acquirers, and find that top-tier IBs command higher fees. Bao and Edmans (2011) find a significant IB fixed effect in acquirers' announcement returns. Sibilkov and McConnell (2014) find that prior client performance positively predicts the likelihood of IBs getting advisory roles from future acquirers and of changes in banks' advisory market shares. Chemmanur *et al.* (2019) find that acquirers that hire investment bankers with more experience have better acquisition performance.

2.3. *Evidence from the real estate market*

Evidence from the real estate market, which bears some resemblance to the market for sale of a private company, can aid our intuition. Do homeowners who hire real estate agents to sell their homes fare better or worse than those who do not? When a homeowner hires an agent to sell her house, the agent advertises the property via a multiple listing service (MLS), a database that links real estate agents. An MLS listing dramatically expands the market for the property because agents assisting potential buyers from anywhere can check the MLS for available properties. For-sale-by-owner (FSBO) houses are not listed on MLS databases. The bundling of MLS and agent representation makes it difficult to measure the effect of hiring an agent on the selling price.[5] But findings of two studies point to an agency cost of hiring a sell-side agent, which comes on top of a typical 6% commission that agents charge sellers. Levitt and Syverson (2008) find that agent-owned homes sell for 3.7% higher than other comparable homes. In a similar vein, Bernheim and Meer (2013)

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[5]The analogy between sell-side M&A advisers and sell-side real estate agents works only up to a point. The latter appear to play a simpler role in the selling process, which mainly consists of providing access to the MLS and serving as communication intermediaries between sellers and agents of potential buyers. As discussed in Sec. 3, sell-side M&A advisers play a more extensive role in the sale process.

study the market for properties that are available only to Stanford University faculty and staff and listed on an MLS, regardless of whether sellers use agents. They find that FSBO properties sell for about 7% more on average than properties sold via agents.

3. The Role of Sell-Side M&A Advisers

A sell-side adviser can identify strategic buyers, evaluate the reasonableness of a bidder's offer, manage and pace concurrent negotiations with multiple bidders, reduce the information advantage that a seasoned acquirer has over a private seller regarding the M&A process, and represent a private seller in negotiations with potential buyers. In Sec. 3.1, we discuss the negotiation process between buyers and sellers. In Sec. 3.2, we discuss how advisers can strengthen the negotiating position of private sellers. In sec. 3.3, we provide possible explanations as to why most private sellers do not hire advisers.[6]

3.1. *Negotiating process*

The owners or top managers of a seller may not know how much their business is worth to a bidder because the bidder has better information about the synergies it expects to realize from the acquisition. The posturing of the buyer and seller during the negotiation process, and their flexibility on price will depend on their perceptions of the relative strengths of their negotiating positions. The strength of either party's negotiating position is affected by factors such as need, time, desire, and competition (see Freund, 1992).

Financial distress can force a private company to find a buyer quickly to avoid bankruptcy. As the parties discuss a possible acquisition, the prospective buyer's analysis of the seller's financial statements and disclosures about debt obligations can reveal whether the seller is financially distressed and is facing a distress sale. That can weaken its ability to negotiate more favorable deal terms with a bidder in a stronger negotiating position. Significant synergies that a prospective buyer expects to realize as a result of an acquisition can intensify a bidder's desire to acquire the seller and cause the bidder to be more flexible in increasing its offer price. Presumably, as the number of bidders increases, the bidder that wants the seller the most will outbid its competitors if it can afford to do so. A bidder's need and the presence of competing bidders strengthen the seller's negotiating position, especially if bidders display their eagerness to acquire it.

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[6]Sections 3.1 and 3.2 are based on Roberts (2009).

3.2. *Benefits of hiring sell-side M&A advisers*

A sell-side adviser can help a private seller in several ways. First, it can aid in identifying strategic buyers. The desire of a private seller's shareholders to cash out, the seller's inability to obtain capital needed to finance growth, and financial distress are examples of situations that can motivate a private seller to initiate the M&A process and identify strategic buyers that would likely benefit from acquiring the company. Advisers often have extensive proprietary M&A databases that can be used to identify potential strategic buyers that a private seller is unaware of. Identifying a pool of potential strategic buyers can result in multiple serious bidders and strengthen the seller's negotiating position.

Second, the adviser can provide the valuation analysis needed by the seller to evaluate the reasonableness of a buyer's potential offer. For example, a private seller's shareholders may believe that their business is worth $20 million, but its M&A adviser may value it at $30 million after forming a compelling valuation analysis based on a key set of assumptions using the IB's knowledge of the seller and the seller's industry, even before considering the value of synergies that a buyer could realize from acquiring the company. Also, the adviser's analysts can glean valuable information from the seller's management during preliminary due diligence that, when skillfully shared with the buy-side of the deal, can persuade a bidder to increase its valuation of the synergies from acquiring the business.[7] In both of these situations, the seller's shareholders are likely to receive more for their business than they would have without the services provided by the adviser.

Third, an M&A adviser can influence the attitudes and assumptions of bidders. If a seller only has one strategic buyer interested in purchasing the company, using an M&A adviser can give the prospective buyer the impression that there are competing strategic buyers against which it must compete to acquire the seller. A seller has more negotiating leverage when a prospective buyer believes that it is competing with other bidders. Also, from the perspective of a bidder's management and advisers, the presence of an M&A adviser adds credibility or *gravitas* to the sell-side of a deal and can affect the attitudes and behavior of the bidder's management and advisers.

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[7] An acquirer buys a seller's business, not merely the assets on the seller's balance sheet. An acquirer, for example, buys the seller's established customer base; existing arrangements, contracts, and relationships with customers and suppliers; brand and trademark recognition; customer loyalty; reputation; proprietary knowledge and trade secrets; patents, copyrights, and un-patented product designs; distribution networks; and the human capital of the seller's employees.

When there is an adviser on the sell-side, the buy-side of the deal must contend with the seller's management, shareholders, and advisers. Thus, an adviser can level the playing field and can decrease the buyer's sense of control over a deal.

Fourth, advisers can manage the auction process. In a negotiated auction, a seller receives at least two bids from potential acquirers. A given bid provides a broad outline of the terms of a proposed deal. During preliminary negotiations, each bidder provides information about the form of consideration that it would pay to the seller, e.g., cash, stock, notes, or some combination of these. A bidder's preliminary offer would include information such as a closing date, the timing of consideration payments, the percentage of the seller's stock being acquired, a description of the business being acquired, and the assets on the balance sheet that the bidder would be buying. The seller and its advisers would discuss and negotiate with each bidder the major elements of the bidder's preliminary offer.

Effective negotiation requires strategy and soft skills, such as the ability to establish rapport with the other side of a deal and discern when to stand firm and when to make concessions during the negotiation process. The sell-side of a deal can potentially strengthen its negotiating position by using an M&A adviser's soft skills and knowledge of the M&A process to pace negotiations with multiple bidders.

Pacing M&A negotiations does not necessarily require that the seller set a deadline by which competing bidders submit their offers. A deadline can weaken a seller's negotiating power by limiting the opportunity to extend negotiations and obtain more favorable terms in the bidders' initial offers. On the other hand, remaining undecided about accepting a bidder's offer gives the bidder more time to change its mind and lose interest in acquiring the seller. One would expect experienced advisers to be more likely than a private seller's management to be skilled at pacing the negotiations so that preliminary negotiations with each bidder end at approximately the same time and within some targeted time window that is not disclosed to bidders.

3.3. *Why do some private sellers choose not to hire M&A advisers?*

An M&A transaction is consummated when buyer and seller sign a definitive agreement that describes, for example, the seller's assets being sold, the values of the assets at the closing date, the amount and type of consideration being paid by the buyer, and the recourse rights of the buyer if various representations made by the seller turn out to be inaccurate during a specified period subsequent to the closing of the deal. A buyer and seller will likely

require the services of legal counsel to verify that the transaction agreement is complete and accurately reflects the negotiated terms of the deal. Given the specialized knowledge required, M&A lawyers sometimes serve as chief negotiators in M&A deals, eliminating the need to hire an IB as an M&A adviser.

The owners of a private target can sometimes be astute and informed negotiators that do not require the expertise of an M&A adviser, for example, when the owners are private equity or venture capital firms. These shareholders are less likely to be at a disadvantage if their firms do not hire advisers. A private seller is also less likely to hire an adviser if the seller thinks that the adviser's fee will be excessive or balks at paying a fee. The benefits of hiring an adviser cannot be quantified by a seller, while the fees can, and sellers sometimes conclude that the adviser's fees would exceed the benefits of the advice. Finally, by doing the deal itself, a seller avoids agency problems that inevitably arise whenever one hires an agent. Evidence from the real estate market discussed in Sec. 2.3 points to the existence of agency costs of hiring a sell-side adviser.

4. Sample

We use the Thomson Financial SDC Mergers and Acquisitions Database to identify all acquisitions that occurred during the period 1993–2010. The sample period begins in 1993 because we need to cross-check for the presence of sell-side advisers from other sources besides SDC for reasons discussed below. We exclude from our sample leveraged buyouts, recapitalizations, spin-offs, privatizations, reverse-takeovers, repurchases, and deals valued below $1 million. We also exclude any deal in which the buyer acquires less than 50% of the seller's stock, the payment structure is labeled as "unknown" by SDC, the seller is a non-U.S. firm, the acquirer is a government entity or joint venture, or the deal is unresolved or withdrawn. Our sample includes all transactions for which SDC reports at least one of the following financial statement items for the seller: sales; net earnings; earnings before interest, taxes, depreciation and amortization (EBITDA); or the book value of stockholders' equity. We follow Officer's (2007) procedure, as described in Sec. 4.1, to calculate a private seller's valuation premium relative to the average valuations of comparable public targets.

Our final sample consists of 3,281 completed acquisitions involving private sellers. Out of these, sellers do not use an adviser in 1,918 or over 58% of the deals according to SDC. Because this proportion seems so large, there is a concern that SDC may not comprehensively report the M&A advisers of

private targets.[8] This issue is particularly important here because the presence of a sell-side adviser is a key variable in our study. To address this concern, we manually cross-check for the presence of a sell-side adviser in these 1,918 deals from two other sources: Lexis-Nexis for deals announced during 1993–1997, and both Lexis-Nexis and Capital IQ for deals announced during 1998–2010.[9] We find a sell-side adviser listed in 191 of these deals from these sources. We classify a deal as not using a sell-side adviser if none of the sources report the seller as using an adviser. Thus, we find that M&A advisers are not retained in 1,727 (= 1,918 − 191) deals and are used in the remaining 1,554 deals. The advisory fees paid by the private sellers are reported in 200 of these deals.[10]

4.1. *Private seller valuation premium*

As noted previously, we follow Officer (2007) and use the modified comparable industry transaction method to calculate private seller valuation premiums (see also Kaplan and Ruback, 1995). We compute an excess deal value multiple as $(A - B)/B$, where A is a deal value multiple for a private seller, and B is the corresponding average multiple for the portfolio of public sellers with the same primary two-digit SIC industry code as the private seller, deal value within $\pm 20\%$ of the private seller deal, and announcement date within ± 1.5 calendar years of the private seller deal announcement.[11] If there is no match, we relax the deal value restriction to 30%, 40%, or 50%, as necessary. We match with replacement of public sellers. We use four excess deal value multiples: *Deal value* to either   sales or EBITDA or net earnings or the book value of equity. To reduce skewness, we discard observations in which the absolute value of the excess deal value multiple exceeds one. We finally compute *Average acquisition premium* for a deal as the average of the available excess deal value multiples.[12] The acquisition premium is usually negative because the acquisition multiple for a private seller is typically less than that for comparable public sellers.

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[8] We thank Micah Officer for pointing this out to us.

[9] Lexis-Nexis and Capital IQ began their complete M&A coverage from 1993 and 1998, respectively.

[10] The availability of fee data is limited because the SEC does not require even public acquirers and sellers to disclose M&A advisory fees (see, e.g., McLaughlin, 1990; Golubov *et al.*, 2012). In a sample of 4,803 deals, Golubov *et al.* find only 829 deals in which bidders' advisory fees are reported. Fees are reported even more rarely by private firms.

[11] We also tried matching based on whether or not the seller uses an M&A adviser. The results are similar.

[12] While the precision of *Average acquisition premium* varies across deals based on the number of valuation measures available, that does not affect our subsequent results. In untabulated regressions of *Average acquisition premium*, when we add the number of valuation measures as a control variable, its coefficient estimate is always insignificant.

4.2. *Measure of adviser reputation*

Following Rau (2000), we rank IBs by their M&A market share for each year in our sample. An IB's market share for a given year equals the total value of completed and withdrawn deals, including tender offers, for which the IB is an adviser, divided by the total value of deals during the year. If two IBs merge during a year, we compute their separate market shares using deals that each advised before the merger. For example, First Boston and Credit Suisse merged in 1988. So for 1988, we calculate separate market shares for First Boston and Credit Suisse using deals that they advised in 1988 before their merger. For that same year, we compute a third market share for deals advised by the combined entity, CS First Boston, after the merger.

To capture the two-tiered structure of Wall Street IBs (see, e.g., Fang, 2005; Golubov *et al.*, 2012), we classify the 10 IBs with the largest market shares as top-tier advisers. IBs ranked 11th through 20th are classified as second-tier, and IBs ranked below 20th are classified as unranked.[13] We group together

Table 1.   Financial adviser ranking.

	Financial Adviser	Transaction Value ($billions)	Number of Deals	% of Years Classified as	
				Top-tier	Second-tier
	Top-tier				
1	Goldman Sachs & Co.	8,589	3,392	100	0
2	Morgan Stanley & Co.	6,561	2,705	78	22
3	Merrill Lynch Capital Markets	5,010	2,434	83	11
4	JP Morgan	4,049	1,960	78	22
5	Credit Suisse First Boston	3,607	2,320	56	44
6	Citigroup/Salomon Smith Barney	3,417	1,666	28	44
7	Lehman Brothers	3,198	1,738	72	17
8	Lazard Freres & Co. LLC	2,249	1,231	56	44
9	Salomon Smith Barney	2,024	770	28	6
10	Bear Stearns & Co. Inc.	1,915	993	50	33
	Second-tier				
11	UBS Investment Bank	1,659	1,062	33	39
12	Bank of America Securities LLC	1,198	839	28	22
13	Donaldson Lufkin & Jenrette	1,113	1,255	33	11
14	Chase Securities Inc.	905	328	6	22
15	Evercore Partners	844	186	11	39
16	Wasserstein Perella Group Inc.	632	295	6	39
17	Houlihan Lokey	622	1967	0	100

[13]Fang (2005) and Golubov *et al.* (2012) use the financial adviser league tables from SDC to rank IBs and classify the top eight advisers as top-tier.

Table 1.   (*Continued*)

	Financial Adviser	Transaction Value ($billions)	Number of Deals	% of Years Classified as	
				Top-tier	Second-tier
18	Sagent Advisers Inc.	543	353	0	61
19	Salomon Brothers	517	407	28	0
20	Blackstone Group LP	470	241	6	56
	Not ranked				
21	Barclays Capital	390	179	11	6
22	Bank of America Merrill Lynch	354	199	11	0
23	Greenhill & Co., LLC	347	148	0	56
24	Wachovia Securities Inc.	347	277	0	33
25	Allen & Co. Inc.	343	85	0	56
26	Dillon, Read & Co. Inc.	293	103	6	6
27	Rothschild Inc.	265	180	0	44
28	Smith Barney, Harris Upham	257	435	11	17
29	Gleacher & Co.	253	63	0	33
30	Rohatyn Associates LLC	222	4	6	11

Notes: This table ranks the top 30 investment-bank M&A advisers by the total value of completed and withdrawn deals, including tender offers that they advised during the period 1993–2010. Totals are computed using data from the Thomson Financial SDC database. Dollar values are inflation-adjusted to 2009. The table also reports for each M&A adviser the total number of deals that it advised during the sample period. An M&A adviser is given full credit for each deal in which it provided advisory services to the seller or acquirer, regardless of the number of advisers working on the deal. For each year in the sample period, we rank all M&A advisers by the total value of deals advised during the year. For a given year, we classify an M&A adviser as *Top-tier* (*Second-tier*) [Not ranked] if it ranks in the top 10 (next 10) [below 20]. We report the percentage of the sample years in which each of these IBs is classified as *Top-tier* and *Second-tier*. Column 1 shows an adviser's rank over the full sample period.

the second-tier and unranked IBs as lower-tier IBs. Table 1 shows the list of the top 30 IBs ranked by total transaction value of the deals that they advised during the period 1993–2010 and the percentage of the sample years in which each of these IBs is classified as top-tier and second-tier. The annual rankings of most IBs listed in Table 1 change from year to year. Exceptions are Goldman Sachs, Merrill Lynch, Morgan Stanley and JP Morgan, which are classified as top-tier for 100%, 83%, 78% and 78%, respectively, of the years in the sample period.

5. Descriptive Statistics

5.1. *Sample distribution by year*

In Panel A of Table 2, the year-wise distribution of acquisitions of private sellers exhibits a pattern that is consistent with the well-documented merger-wave phenomenon (see, e.g., Harford, 2005). About 19% of the acquisitions in

Table 2. Sample distribution.

Panel A: Year distribution

Year	All Acquisitions	No Seller Adviser	Seller Adviser	Lower-Tier Seller Adviser	Top-Tier Seller Adviser	Stand-Alone	Subsidiary
1993	308	198	110	65	45	198	110
1994	331	196	135	102	33	245	86
1995	168	109	59	43	16	121	47
1996	141	67	74	45	29	100	41
1997	359	235	124	77	47	236	123
1998	286	162	124	91	33	193	93
1999	245	115	130	96	34	156	89
2000	214	106	108	70	38	125	89
2001	132	57	75	53	22	75	57
2002	98	41	57	37	20	60	38
2003	122	37	85	62	23	80	42
2004	155	76	79	57	22	110	45
2005	160	78	82	45	37	107	53
2006	160	68	92	65	27	115	45
2007	146	64	82	52	30	91	55
2008	129	61	68	55	13	97	32
2009	73	36	37	30	7	48	25
2010	54	21	33	23	10	31	23
Total	3,281	1,727	1,554	1,068	486	2,188	1,093

Table 2. (*Continued*)

Panel B: Seller industry distribution

Industry (Two-digit SIC Codes)	All Acquisitions #	%	No Seller Adviser #	%	Seller Adviser #	%	Lower-Tier Seller Adviser #	%	Top-Tier Seller Adviser #	%	Stand-Alone #	%	Subsidiary #	%
Agriculture (01–09)	1	0.0	0	0.0	1	0.1	1	0.1	0	0.0	0	0.0	1	0.1
Mining (10–14)	75	2.3	48	2.8	27	1.7	16	1.5	11	2.3	47	2.1	28	2.6
Construction (15–19)	17	0.5	7	0.4	10	0.6	5	0.5	5	1.0	8	0.4	9	0.8
Food and tobacco (20–21)	61	1.9	22	1.3	39	2.5	22	2.1	17	3.5	27	1.2	34	3.1
Textiles and apparel (22–23)	26	0.8	12	0.7	14	0.9	8	0.7	6	1.2	14	0.6	12	1.1
Lumber, furniture, paper, and print (24–27)	45	1.4	20	1.2	25	1.6	12	1.1	13	2.7	23	1.1	22	2.0
Chemicals (28)	188	5.7	101	5.8	87	5.6	50	4.7	37	7.6	94	4.3	94	8.6
Petroleum, rubber, and plastics (29–30)	30	0.9	19	1.1	11	0.7	9	0.8	2	0.4	14	0.6	16	1.5
Leather, stone, glass (31–32)	14	0.4	6	0.3	8	0.5	3	0.3	5	1.0	4	0.2	10	0.9
Primary and fabricated metals (33–34)	66	2.0	31	1.8	35	2.3	24	2.2	11	2.3	28	1.3	38	3.5
Machinery (35–36)	358	10.9	181	10.5	177	11.4	116	10.9	61	12.6	194	8.9	164	15.0
Transport equipment (37)	53	1.6	26	1.5	27	1.7	14	1.3	13	2.7	20	0.9	33	3.0
Instruments and other manufacturing (38–39)	274	8.4	167	9.7	107	6.9	74	6.9	33	6.8	166	7.6	108	9.9
Transport, communications, utilities (40–49)	199	6.1	112	6.5	87	5.6	43	4.0	44	9.1	114	5.2	85	7.8
Wholesale trade (50–51)	137	4.2	90	5.2	47	3.0	30	2.8	17	3.5	94	4.3	43	3.9
Retail trade (52–59)	80	2.4	45	2.6	35	2.3	20	1.9	15	3.1	62	2.8	18	1.6
Finance, insurance, real estate (60–69)	521	15.9	189	10.9	332	21.4	261	24.4	71	14.6	438	20.0	83	7.6
Hotels and personal services (70–71)	10	0.3	4	0.2	6	0.4	4	0.4	2	0.4	5	0.2	5	0.5
Services (72–89)	1,126	34.3	647	37.5	479	30.8	356	33.3	123	25.3	836	38.2	290	26.5
Public administration and others (90–99)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	3,281	100.0	1,727	100.0	1,554	100.0	1,068	100.0	486	100.0	2,188	100.0	1,093	100.0

Notes: Panels A (B) shows the year (industry) distributions for the full sample and six subsamples. The full sample consists of 3,281 completed acquisitions of private U.S. firms during the period 1993–2010 for which SDC reports enough data to compute excess deal valuation multiples. The grouping of two-digit SIC codes follows Song and Walkling (1993). We group deals based on whether sellers use M&A advisers and report the distributions for the two subsamples. The subsample of deals that employ sell-side advisers is broken down further into two subsamples based on whether the sell-side adviser is a top-tier or lower-tier adviser. We classify an M&A adviser as *Top-tier* (*Lower-tier*) if its market share ranks in the top 10 (below 10). The full sample is also broken down into two subsamples based on whether private sellers are stand-alone firms or subsidiaries.

our sample occurred during 1993–1994, and another 34% during the 1997–2000 stock market "bubble". About 67% of the private sellers are stand-alone firms, while the remaining are subsidiaries. Of the 3,281 private sellers in our sample, 1,554 (about 47%) hire advisers, and 486 of the latter (about 31%) employ top-tier IBs.

Panel B of Table 2 shows industry distributions of acquisitions of private sellers. Using Song and Walkling's (1993) 20-industry grouping, we identify a seller's industry using its primary two-digit SIC code reported by SDC. Similar to the industry distribution of acquisitions of public sellers during the sample period (see, e.g., Agrawal *et al.*, 2013), the top three industries with private sellers are services, financial, and machinery manufacturers, representing 34%, 16%, and 11%, respectively, of the deals in our sample. Industry distributions of deals grouped according to whether a private seller uses an M&A adviser, hires a top-tier IB, or is a stand-alone firm are generally similar to that for the full sample of private sellers.

5.2. *Sample characteristics*

Table 3 reports mean and median values for various characteristics of the deals in our sample. Panel A reports descriptive statistics for the overall sample. The number of observations varies across the characteristics due to data availability. The sample characteristics reported in Panel A of Table 3 are consistent with previous studies. Private sellers in our sample receive lower valuation multiples than comparable public sellers; all four excess deal value multiples for private sellers are negative with mean values ranging from about −3% to −36%. The mean (median) *Acquisition premium* is −22% (−25%). These values are comparable in magnitude to the mean (median) acquisition premium of −15% (−30%) found by Officer (2007).

Panel A also compares the acquisition valuations of private sellers with and without advisers. The mean (median) value of *Excess deal value to net earnings* is −33% (−42%) for private sellers that use advisers compared to −40% (−52%) for private sellers that do not use advisers. The differences between the two groups in both the mean and median values of this variable are statistically significant at the 5% level. For the other three excess deal value multiples and *Acquisition premium*, the differences between the two groups of private sellers in both the mean and median values are statistically indistinguishable.

Panel B in Table 3 reports descriptive statistics for the subsample of private sellers partitioned by whether they use top-tier or lower-tier advisers.

Table 3.   Sample characteristics.

Panel A. Acquisitions with versus without seller M&A adviser

	All Acquisitions			Mean			Median			
	Mean	Median	N	Seller Adviser	No Seller Adviser	p-value	Seller Adviser	No Seller Adviser	p-value	Sample Size
Valuations										
Excess deal value to:										
Sales	−0.206	−0.269	2,840	−0.210	−0.202	0.671	−0.256	−0.273	0.819	1,353/1,487
Net earnings	−0.362	−0.460	908	−0.330	−0.402	0.019	−0.416	−0.518	0.021	508/400
EBITDA	−0.245	−0.314	817	−0.244	−0.246	0.947	−0.309	−0.32	0.607	449/368
Book value of equity	−0.032	−0.032	888	−0.039	−0.023	0.664	−0.033	−0.025	0.683	497/391
Acquisition premium	−0.216	−0.253	3,281	−0.224	−0.208	0.334	−0.243	−0.258	0.683	1,554/1,727
Deal characteristics										
Deal value ($ mil.)	232	43	3,281	417	66	0.000	98	24	0.000	1,554/1,727
Cash	0.486	0	3,281	0.533	0.444	0.000	1	0	0.000	1,554/1,727
Same industry	0.605	1	3,281	0.636	0.577	0.001	1	1	0.002	1,554/1,727
Days to deal completion	69	41	3,281	85	55	0.000	53	27	0.000	1,554/1,727
Seller characteristics										
ROA	0.049	0.029	1,655	−0.054	0.148	0.040	0.016	0.054	0.000	815/840
Subsidiary	0.333	0	3,281	0.401	0.272	0.000	0	0	0.000	1,554/1,727
Adviser fee	0.013	0.007	200							
Acquirer characteristics										
Market value ($ mil.)	2,365	412	2,473	3,690	1,120	0.000	728	232	0.000	1,198/1,275
Book value of assets ($ mil.)	4,908	359	2,749	7,966	1,999	0.000	815	159	0.000	1,340/1,409
Public	0.892	1	3,281	0.896	0.889	0.523	1	1	0.366	1,554/1,727
Acquirer CAR (−1, +1)	0.028	0.014	2,477	0.027	0.029	0.584	0.013	0.014	0.728	1,200/1,277
Acquirer adviser	0.342	0	3,281	0.516	0.185	0.000	1	0	0.000	1,554/1,727
# of acquirer advisers	1.164	1.000	1,121	1.2	1.075	0.000	1	1	0.000	802/319
Top-tier acquirer adviser	0.129	0	3,281	0.227	0.041	0.000	0	0	0.000	1,554/1,727
Foreign acquirer	0.113	0	3,281	0.123	0.104	0.082	0	0	0.082	1,544/1,727

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Table 3. (*Continued*)

Panel B. Acquisitions with top-tier versus lower-tier seller M&A adviser

	Mean			Median			Sample Size
	Top-tier Seller Adviser	Lower-tier Seller Adviser	p-value	Top-tier Seller Adviser	Lower-tier Seller Adviser	p-value	
Valuation							
Excess deal value to:							
Sales	−0.289	−0.174	0.000	−0.415	−0.211	0.000	421/932
Net earnings	−0.312	−0.336	0.627	−0.416	−0.417	0.968	127/381
EBITDA	−0.320	−0.219	0.045	−0.361	−0.272	0.037	110/339
Book value of equity	−0.195	0.018	0.000	−0.335	0.025	0.000	132/365
Acquisition premium	−0.289	−0.195	0.000	−0.374	−0.205	0.000	486/1,068
Deal characteristics							
Deal value ($ mil.)	937	180	0.000	354	60	0.000	486/1,068
Cash	0.646	0.482	0.000	1	0	0.000	486/1,068
Same industry	0.603	0.651	0.069	1	1	0.065	486/1,068
Days to deal completion	96	80	0.002	64	46	0.000	486/1,068
Seller characteristics							
ROA	−0.103	−0.034	0.631	0.032	0.014	0.400	234/571
Subsidiary	0.582	0.318	0.000	1	0	0.000	486/1,068
Adviser fee	0.033	0.008	0.041	0.006	0.007	0.552	36/164
Acquirer characteristics							
Market value ($ mil.)	6,424	2,439	0.000	1,249	520	0.000	376/822
Book value of assets ($ mil.)	15,191	4,703	0.001	1,109	611	0.000	417/923
Public	0.887	0.900	0.438	1	1	0.341	486/1,068
Acquirer CAR (−1, +1)	0.042	0.021	0.000	0.024	0.009	0.000	376/824
Acquirer adviser	0.743	0.413	0.000	1	0	0.000	486/1,068
# of acquirer advisers	1.291	1.125	0.000	1	1	0.000	361/441
Top-tier acquirer adviser	0.442	0.128	0.000	0	0	0.000	486/1,068
Foreign acquirer	0.16	0.106	0.002	0	0	0.002	486/1,068

Notes: This table reports the mean and median values for excess deal valuation multiples and various deal, seller, and acquirer characteristics. The full sample consists of 3,281 completed acquisitions of private U.S. firms during the period 1993–2010 for which SDC reports enough data to compute excess deal valuation multiples. The number of observations reported for a given excess deal valuation multiple or other characteristic depends on data availability. Panel A reports mean and median values for the full sample and subsamples that group deals based on whether sellers use M&A advisers. Panel B reports mean and median values for subsamples that group deals based on whether sellers use top-tier or lower-tier advisers. *p*-values for differences in mean (median) values are from two-tailed *t*-tests (Wilcoxon rank-sum tests). Variables are defined in Appendix A.

The mean and median valuation premiums for the *Top-tier adviser* group are significantly lower than those for the *Lower-tier adviser* group, except for the *Excess deal value to net earnings* measure. The mean valuation premium for deals in which sellers use top-tier advisers ranges from -32% for *Excess deal value to EBITDA* to about -20% for *Excess deal value to book value of equity*; for deals where they use lower-tier advisers, it ranges from about -34% for *Excess deal value to net earnings* to 1.8% for *Excess deal value to book value of equity*.

The results of univariate comparisons could be misleading if acquisitions of sellers that use advisers, top-tier advisers, or no advisers have systematic differences in seller-, acquirer-, and deal-specific attributes. For example, Table 3 shows that: (1) advisers are retained by less profitable sellers with lower median ROA(net earnings divided by total assets); (2) sellers with advisers or top-tier advisers are acquired by larger bidders in terms of total assets and the market value of equity; and (3) sellers hire advisers or top-tier advisers in larger deals. In deals with (without) seller advisers, 40.1% (27.2%) of sellers are subsidiaries of private firms. Among deals in which sellers use advisers, 58.2% (31.8%) of sellers with top-tier (lower-tier) advisers are subsidiaries of private firms. All these differences are statistically significant at the 1% level.

Deals with seller advisers or top-tier advisers more often are cash deals. In Panel A of Table 3, about 53% (44%) of the deals with (without) seller advisers are cash offers. In Panel B, about 65% (48%) of the deals in which sellers use top-tier (lower-tier) advisers involve cash offers. Both differences are statistically significant at the 1% level. In Panel B, top-tier seller advisers command significantly larger fees than lower-tier seller advisers, on average.

In sum, the univariate results reported in Table 3 indicate that, on average, the use of advisers is unrelated to private sellers' valuations, while the use of top-tier advisers is negatively related to their valuations. But these univariate comparisons do not control for other determinants of private sellers' valuations. Moreover, the table suggests that private sellers that are likely to receive lower valuations may be more inclined to use advisers and top-tier advisers. Consequently, the endogenous selection of advisers by private sellers also needs to be accounted for when examining the effects of using advisers. We tackle both of these issues next.

6. Empirical Models and Results

6.1. *Determinants of private sellers' decision to use M&A advisers*

We start by analyzing factors that influence the likelihood that a private seller hires advisers and the probability that it chooses top-tier, rather than

lower-tier advisers. We estimate the propensity of private sellers to hire advisers using probit and linear probability (i.e., OLS) regression models. In model 1, the probit and OLS regressions are estimated using the full sample; the dependent variable is *Seller adviser*, which equals one if a private seller uses an M&A adviser and equals zero otherwise. In model 2, the probit and OLS regressions are estimated using the subsample of deals in which private sellers hire advisers; the dependent variable here is *Top-tier seller adviser*, which equals one if a seller hires a top-tier adviser and equals zero otherwise.[14] In the regression models, we include independent variables that can affect the likelihood that a private seller hires an M&A adviser and chooses a top-tier rather than a lower-tier adviser. We discuss below the explanatory variables included in both models 1 and 2 and the regression results shown in Table 4.

Table 4.   Choice to use a (top-tier) seller M&A adviser.

	Model 1 Seller Adviser		Model 2 Top-tier Seller Adviser	
	OLS	Probit	OLS	Probit
Ln(Deal value)	0.073***	0.268***	0.087***	0.380***
	(0.000)	(0.000)	(0.000)	(0.000)
Ln(Acquirer total assets)	0.036***	0.117***	0.008	0.043
	(0.000)	(0.000)	(0.529)	(0.433)
Public acquirer	0.036	0.081	−0.035	−0.119
	(0.641)	(0.747)	(0.732)	(0.748)
Seller ROA	−0.057***	−0.192***	−0.001	−0.010
	(0.002)	(0.002)	(0.973)	(0.942)
Acquirer adviser	0.149***	0.432***	0.108***	0.443***
	(0.000)	(0.000)	(0.003)	(0.006)
Top-tier acquirer adviser	0.085**	0.352**	0.044	0.040
	(0.030)	(0.015)	(0.394)	(0.803)
Subsidiary seller	0.014	0.092	0.020	0.093
	(0.628)	(0.336)	(0.612)	(0.521)
Different state	0.013	0.041	0.074**	0.511***
	(0.651)	(0.660)	(0.031)	(0.006)
Foreign acquirer	−0.063	−0.329	−0.008	0.155
	(0.383)	(0.424)	(0.936)	(0.608)
Same industry	−0.010	−0.042	0.010	0.032
	(0.710)	(0.643)	(0.775)	(0.824)
C&I loan spread	−0.101	−0.565	−0.057	−0.142
	(0.590)	(0.383)	(0.805)	(0.882)
IPO volume	−0.099	−0.352	−0.190**	−0.941**

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[14] All our results on top-tier advisers are similar if we define them as the top 20 IBs by M&A market share in a given year, instead of the top 10.

Table 4.   (*Continued*)

	Model 1 Seller Adviser		Model 2 Top-tier Seller Adviser	
	OLS	Probit	OLS	Probit
	(0.149)	(0.133)	(0.024)	(0.029)
Recession	0.029	0.108	−0.092	−0.303
	(0.745)	(0.711)	(0.324)	(0.473)
Cash	0.033	0.088	0.066*	0.249*
	(0.226)	(0.331)	(0.080)	(0.093)
IV_{1a}: Prevalence of seller adviser	0.095	0.395*		
	(0.138)	(0.077)		
IV_{1b}: Prevalence of top-tier			0.267**	0.848**
seller adviser			(0.030)	(0.038)
IV_2: Close to financial advisers	0.054**	0.201**	0.145***	0.647***
	(0.029)	(0.019)	(0.000)	(0.000)
Constant	0.155	−0.752	0.379	−0.925
	(0.668)	(0.543)	(0.373)	(0.611)
Year and industry fixed effects	Yes	Yes	Yes	Yes
Observations	1,433	1,433	733	733
Adjusted (Pseudo) R-squared	0.283	0.276	0.299	0.365
p-value of F-test for joint significance of the two IVs	0.031	0.012	0.000	0.000

Notes: This table shows results from OLS and probit regressions of the choice of hiring a (top-tier) seller adviser. The full sample consists of completed acquisitions of private U.S. firms during the period 1993–2010 for which SDC reports enough data to compute acquisition premium. In model 1, the dependent variable is *Seller adviser*, which equals one if a seller is advised by an M&A adviser and equals zero otherwise. The regressions in model 2 use the subsample of deals in which sellers hire M&A advisers; the dependent variable is *Top-tier seller adviser*, which equals one if a seller hires a top-tier M&A adviser and equals zero otherwise. We report p-values in parentheses below coefficient estimates. p-values are based on heteroskedasticity-adjusted standard errors. Variables are defined in Appendix A. The superscripts ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

All variables are defined in Appendix A. All models include year and industry fixed effects.

We use *Deal value* to control for deal size and complexity because, as argued by Servaes and Zenner (1996), acquirers and targets involved in complex transactions have greater need for M&A advisory services. We expect the opportunity cost of not hiring an adviser or hiring a lower-tier adviser to be higher for larger deals, which implies that private sellers are more likely to hire advisers and top-tier advisers in larger deals. Consistent with this idea, the coefficients estimates for *Deal value* are positive and statistically significant in the OLS and probit regressions for both models in Table 4.

The regressions in Table 4 control for *Acquirer total assets*. The relative bargaining power of a seller should be negatively related to buyer size. Larger

acquirers are likely to have more acquisition experience dealing with sellers and greater capacity to devote substantial resources to the M&A process, allowing them to hire top-tier lawyers or maintain in-house M&A expertise. To counter larger acquirers' greater bargaining power, we expect a private seller to be more likely to hire an adviser or a top-tier adviser when the acquirer is larger. Consistent with this expectation, the coefficient estimate of *Ln(Acquirer total assets)* is positive in both models in Table 4 and statistically significant in model 1. Similarly, an acquirer that is public is more likely to have managers with M&A expertise. Our results don't support the idea that a private seller is more likely to hire an M&A adviser to counter the greater negotiating power of a public acquirer; the coefficient estimate of *Public acquirer* is statistically insignificant in Table 4.

We use the variable *Seller ROA* to control for the profitability of sellers. All else equal, a more profitable seller is a more attractive target and has greater negotiating power due to competition among bidders. Consequently, we expect a negative relation between *Seller ROA* and the seller's likelihood of hiring an M&A adviser. In Table 4, the coefficient estimates for *Seller ROA* are negative in both models and statistically significant in model 1.

The presence of an M&A adviser on the buy-side should motivate a private seller to hire an M&A adviser to improve its bargaining power, so we include *Acquirer adviser* in the regressions in Table 4. In addition, a top-tier adviser has greater resources that it can use to provide higher-quality advice. So a seller would see a greater need to hire an M&A adviser when the buyer's M&A adviser is a top-tier IB, and we include *Top-tier acquirer adviser* in the regressions. In Table 4, the likelihood of a private seller hiring an adviser is higher when the acquirer uses an adviser and higher still if the acquirer's adviser is top-tier. The coefficient estimates for *Acquirer adviser* and *Top-tier acquirer adviser* are positive in all regressions in Table 4. The coefficient estimates for *Acquirer adviser* are statistically significant at the 1% level in both models. In model 1, the coefficient estimate for *Top-tier acquirer adviser* is statistically significant at the 5% level in both regressions. This result is consistent with Kale *et al.*'s (2003) argument that the relative reputation of advisers on the buy-side and sell-side matters due to the bargaining involved in M&A deals.[15]

Officer (2007) finds that the acquisition valuations for private sellers that are subsidiaries are lower than for stand-alone firms, consistent with greater

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[15]We also check whether a private seller shares an M&A adviser with its acquirer (see Agrawal *et al.*, 2013). Common advisers are very rare in our sample, found in only 13 deals out of 3,281. Controlling for their presence has essentially no effect on our results.

information asymmetry faced by subsidiary sellers which don't have to report separate financials even if their parent companies are public. We expect that parent companies selling subsidiaries are more likely to retain advisers and top-tier advisers to reduce their potentially higher valuation discounts. Alternatively, parent companies may be financially sophisticated, making them less likely to hire advisers. The coefficient estimate of *Subsidiary sellers* is positive in all the regressions, though it is statistically insignificant.

Uysal *et al.* (2008) find a positive relation between geographic distance and the costs of obtaining information. We use the variable *Different state* as a proxy for geographic distance; it equals one if the corporate headquarters of the buyer and seller are in different states and equals zero otherwise. If private sellers use advisers to reduce the costs of obtaining information, the propensity to use advisers and top-tier advisers would be greater when the buyer and seller are headquartered in different states. Alternatively, advisers may use their resources to find potential acquirers across a larger geographical area, making an out-of-state acquirer more likely. The results in Table 4 are consistent with both of these ideas. In model 2, the coefficient estimates for *Different state* are positive and statistically significant in both regressions.[16] These arguments also suggest that private sellers should be more likely to retain advisers when buyers are non-U.S. firms, so we include a dummy variable *Foreign acquirer* in the regression. But the coefficient estimate of this variable is insignificant in both models.

Next, a buyer and seller in the same industry have a higher probability of being competitors. One would expect a seller to be more likely to hire an adviser and hire a top-tier adviser when a potential buyer is a competitor, so we control for whether both parties are in the same industry. The coefficient estimate of *Same industry* is insignificant in both models.

Officer (2007) finds that the "price" of liquidity adversely affects private sellers' valuations. We control for the price of liquidity because it measures the cost of debt financing. As the price of liquidity increases, a seller's need for an M&A adviser increases because the number of potential buyers that would be interested in acquiring the seller decreases, all else being equal. We estimate the cost of liquidity, *C&I loan spread*, using the four-quarter

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[16] If there have been several recent comparable deals in the seller's industry, then deal valuation and negotiation can be easier, reducing the need for a seller to hire an adviser. We tried controlling for the number of comparable deals in the seller's two-digit SIC industry, with deal values within 1/3 to 3 times the value of a given deal within one year before its announcement. The coefficient estimate of this variable turns out to be positive in model 1 and negative in model 2; both are statistically insignificant.

moving average of the spread between commercial and industrial (C&I) loan rates and the federal funds rates.[17]

Firms are less likely to acquire other companies during economic recessions. During a weak economy, potential sellers have greater incentive to hire advisers that can search for prospective buyers. And IBs are more readily available to serve as advisers due to lower activity in the M&A market. So we include in the regressions a dummy variable *Recession*, which equals one if the acquisition is announced during a recession period, as defined by the National Bureau of Economic Research (NBER), and zero otherwise. The coefficient estimates for *C&I loan spread*, and *Recession* are statistically insignificant in all the regressions in Table 4.

Officer (2007) finds that private sellers obtain higher valuations in the IPO market than in the M&A market.[18] We control for IPO activity in the regressions in Table 4 because the IPO market is an alternative to the M&A market as an exit avenue for shareholders of private firms. High IPO volume indicates favorable conditions in the IPO market. As IPO volume increases, the ability of a private firm to go public increases, reducing its need for an M&A adviser due to an increase in the strength of its negotiating position. We control for IPO activity using the variable *IPO volume*, which equals the four-quarter moving average of the number of IPOs per quarter scaled by the number of firms listed on CRSP at the beginning of the quarter. The coefficient estimate of *IPO volume* is negative in both models and statistically significant in model (2).

A selling shareholder that receives shares of the acquirer's stock as consideration gets a financial asset whose market value changes daily. M&A advisers have expertise in estimating the intrinsic value of a buyer's stock to assess the reasonableness of a stock offer. We expect the likelihood that a private seller uses an M&A adviser to be lower when shareholders of the seller are paid with cash instead of stock, so we include in the regression a binary variable *Cash*. But, contrary to our expectation, the coefficient estimate of *Cash* is positive and statistically significant in model 2.

We use the variable *Prevalence of seller adviser or top-tier adviser* to measure how common it is for private sellers within an industry to use

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[17]Harford (2005) uses the C&I spread as a proxy for aggregate liquidity. We obtain part of this data from the Federal Reserve Board's website (http://www.federalreserve.gov/release); the rest was generously provided by Professor Jarrad Harford.

[18]Lian and Wang (2012) find that withdrawing an IPO filing in order to be acquired reduces the acquisition discount for a private seller. That can affect its decision on hiring an adviser. When we add a dummy variable for whether the seller filed for an IPO within two years before the announcement date of its acquisition, its coefficient is positive in both models, but statistically insignificant.

advisers or top-tier advisers. *Prevalence of seller adviser or top-tier adviser* is measured as the proportion of private seller firms in the seller's two-digit SIC industry that have used advisers or top-tier advisers in the year before deal announcements. We hypothesize that a private seller is more likely to hire an M&A adviser (top-tier adviser) if using a sell-side adviser (top-tier adviser) is the norm in the seller's industry. Consistent with this conjecture, the coefficient estimate of *Prevalence of seller adviser* is positive in both regressions in model 1 and statistically significant at the 10% level in the probit model. The estimated coefficient of *Prevalence of top-tier seller adviser* is positive and statistically significant at the 5% level in model 2.

Finally, a seller that is located close to M&A advisers is more likely to hire an adviser and choose a top-tier adviser because proximity breeds greater familiarity with and access to advisers. Accordingly, we control for whether a private seller is located close to a financial adviser. In our regressions, the estimated coefficient of *Close to financial advisers*, which equals one if a target is located in New York, New Jersey, California, Illinois, or Massachusetts and equals zero otherwise, is positive and statistically significant in both models in Table 4.

6.2. *The impact of M&A advisers on private sellers' acquisition valuations*

6.2.1. *Methodologies*

Our analysis of private sellers' acquisition valuations needs to consider the possibility that private sellers' decision to hire advisers is endogenous to their acquisition valuations. Private sellers that face a greater opportunity cost of not hiring an adviser or that expect to receive lower acquisition valuations are more likely to retain advisers and top-tier advisers to improve their bargaining positions. This endogenous selection can potentially bias estimates of the impact that hiring advisers has on private sellers' valuations. Another identification concern involves omitted variables.

In addition to controlling for a large number of factors related to private sellers' opportunity costs and acquisition valuations, we use five econometric approaches to address these concerns. These methods are: (1) two-stage least squares (2SLS), (2) Heckman's (1979) treatment effect model, (3) endogenous switching regressions, (4) Abadie and Imbens (2006) matching (AIM), and (5) propensity score matching (PSM). The first approach deals with omitted variables. The next two approaches correct for selection bias based on unobservable variables. The last two approaches deal with selection bias based on observables.

The first three approaches use instrumental variables (IVs) to analyze the propensity of hiring M&A advisers. We use two IVs, *Prevalence of seller adviser* (*Prevalence of top-tier seller adviser* for the subsample of deals that use sell-side advisers) and *Close to financial advisers.* In the treatment effect, 2SLS, and switching regressions, the IVs are included in the first-stage regression dealing with the choice to use advisers (or top-tier advisers) and are excluded from the second-stage regressions in which *Average Acquisition Premium* is the dependent variable. We believe the two IVs are valid. First, they are relevant to the private sellers' decision to hire advisers (or top-tier advisers). As we discuss in Sec. 6.1, there are compelling *a priori* reasons to include the IVs in the first-stage equation. Empirically, in Table 4, we find both to be significant determinants of the likelihood that private sellers hire advisers and top-tier advisers. As shown in Table 4, the *p*-value for the joint significance of the two IVs in the first-stage OLS regression is 0.031 (0.000) for advisers (top-tier advisers).

Second, the IVs must meet the exclusion restriction, i.e., they should not belong in the second-stage equation explaining *Average acquisition premium.* The variable *Prevalence of seller adviser* (*Prevalence of top-tier adviser*) measures how commonly M&A advisers (top-tier advisers) are used by private seller firms within an industry to guide them through the M&A process. There is no reason why this variable should affect the acquisition valuation of a particular private seller, except via its effect on the firm's decision to hire an adviser or top-tier adviser. Similarly, we follow Huang *et al.* (2014) and exploit the cross-sectional variation in private sellers' geographic location to construct our second instrument,*Close to financial advisers.* Geographic proximity between sellers and financial advisors increases the likelihood of interaction between them (e.g., via local professional meetings). Therefore, a private seller in a state close to financial advisers is likely more familiar with and has easier access to financial advisers. We expect such sellers to be more likely to hire advisers. There seems to be no direct economic link between geographic proximity to advisers and a private seller's acquisition valuation, other than via its effect on the likelihood that a private seller will use an adviser.[19,20]

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[19] While not a formal test of the exclusion restriction because none exists, if we add *Prevalence of seller adviser* (*Prevalence of top-tier seller adviser*) as an explanatory variable in the OLS regression in model 1 (2) of Table 5, its coefficient is positive (negative), with a *p*-value of 0.446 (0.886). Similarly, if we add *Close to financial advisers* in the same regressions, its coefficient is negative (positive), with a *p*-value of 0.588 (0.174).

[20] Huang *et al.* (2014) use this variable as an instrument for investment bankers' tendency to serve on boards of nearby acquirers.

6.2.2. *OLS, Heckman treatment effect, and 2SLS regressions*

The results of the OLS, Heckman treatment effect (second-stage), and 2SLS (second-stage) regressions of *Average acquisition premium* are reported in Table 5. To address the potential selection bias, we first use a two-stage treatment effect model (see Maddala, 1983; Heckman, 1979). The first-stage regression of the treatment effect model is the probit model from Table 4. We use the coefficient estimates from the first-stage to calculate the *inverse Mills ratio*, which is added to the second-stage regression of *Average acquisition premium* in the treatment effect model.

Next, we use 2SLS estimation to account for the potential selection bias. The first-stage equation in the 2SLS model is the OLS regression from Table 4. In the second-stage of 2SLS, we instrument *Seller adviser* and *Top-tier seller adviser*. A linear probability model for the first-stage regression generates consistent second-stage estimates even with a binary endogenous variable (see Angrist and Krueger, 2001; Angrist and Pischke, 2009). The 2SLS estimator is consistent but not unbiased; however, having a large sample makes the 2SLS results more reliable. The first three columns in Table 5 show estimates for the full sample (model 1); the last three columns show estimates for the subsample of deals where sellers use advisers (model 2).

In the OLS regressions in Table 5, the coefficient estimates for *Seller adviser* and *Top-tier seller adviser* are positive but statistically insignificant. However, unlike the Heckman treatment effect and 2SLS models, the OLS regressions do not account for the potential endogenous choice to use an M&A adviser or a top-tier adviser. In the second-stage of the treatment effect regression for model 1 (2) in Table 5, the estimated coefficient for the *inverse Mills ratio* is statistically significant at the 5% level for the decision to use a seller (top-tier) adviser, suggesting that the choice to use sell-side advisers (top-tier advisers) is endogenous to the seller's acquisition premium. The negative coefficient estimate of the *inverse Mills ratio* suggests that private sellers with certain firm- and deal-specific attributes that negatively affect acquisition premiums are more likely to retain advisers and top-tier advisers to guide them through the M&A process. The coefficient estimates for *Seller adviser* and *Top-tier seller adviser* in the treatment effect regressions are both positive and statistically significant at the 10% level, suggesting that using advisers increases private sellers' acquisition valuations, after accounting for self-selection.

The results from 2SLS are consistent with those from the treatment effect model. First, the *p*-value of the endogeneity test (Durbin–Wu–Hausman test)

is less than 0.05 (0.10) in model 1 (2), consistent with a private seller's decision to use an M&A adviser (top-tier adviser) being endogenous in this framework. In 2SLS regressions, the estimated coefficients of *Seller adviser* and *Top-tier seller adviser* are also positive and statistically significant at the 5% and 10% levels, respectively, confirming that private sellers receive higher acquisition premiums when they hire advisers and that premiums are higher still when they pick top-tier advisers. Treatment effect (2SLS) estimates from model 1 suggest that the acquisition premium is about 25% (59%) higher in deals where the private seller uses an M&A adviser; the corresponding estimates from model 2 suggest that the premium is about 25% (40%) higher when the seller uses a top-tier adviser rather than a lower-tier adviser.

As for control variables, in model 1 in Table 5, the coefficient estimates are significantly negative (positive) for *Ln(Acquirer total assets)*, *Subsidiary*

Table 5.   Regressions of acquisition premium.

	Dependent Variable: Average Acquisition Premium					
	Model 1: All Deals			Model 2: Deals with Sell-side Advisers		
	OLS	Treatment Effect Model	2SLS	OLS	Treatment Effect Model	2SLS
Seller adviser	0.007	0.246*	0.587*			
	(0.802)	(0.083)	(0.077)			
Top-tier seller adviser				0.013	0.247*	0.401*
				(0.779)	(0.067)	(0.102)
Ln(Acquirer total assets)	−0.030***	−0.037***	−0.041*	−0.032**	−0.032**	−0.040***
	(0.001)	(0.000)	(0.071)	(0.026)	(0.014)	(0.004)
Seller ROA	−0.044*	−0.025	−0.005	−0.092**	−0.092***	−0.082**
	(0.099)	(0.220)	(0.876)	(0.014)	(0.001)	(0.043)
Ln(Deal value)	0.039***	0.022	−0.009	0.037**	0.015	0.011
	(0.002)	(0.176)	(0.680)	(0.045)	(0.474)	(0.677)
Public acquirer	0.027	0.010	0.005	−0.041	−0.025	−0.043
	(0.713)	(0.903)	(0.950)	(0.717)	(0.822)	(0.718)
Subsidiary seller	−0.116***	−0.117***	−0.126***	−0.109***	−0.119***	−0.095**
	(0.000)	(0.000)	(0.000)	(0.008)	(0.001)	(0.020)
Same industry	0.026	0.026	0.030	0.013	−0.000	−0.004
	(0.357)	(0.329)	(0.328)	(0.758)	(0.997)	(0.919)
Cash	−0.042	−0.055**	−0.071**	−0.026	−0.043	−0.057
	(0.107)	(0.041)	(0.016)	(0.528)	(0.271)	(0.210)
Acquirer adviser	−0.033	−0.066*	−0.114*	−0.045	−0.070*	−0.101**
	(0.257)	(0.063)	(0.067)	(0.287)	(0.091)	(0.041)
Top-tier acquirer adviser	0.037	0.017	−0.010	0.017	0.010	0.001
	(0.375)	(0.671)	(0.846)	(0.733)	(0.823)	(0.978)

Table 5.   (*Continued*)

| | Dependent Variable: Average Acquisition Premium | | | | | |
| | Model 1:
All Deals | | | Model 2: Deals with
Sell-side Advisers | | |
	OLS	Treatment Effect Model	2SLS	OLS	Treatment Effect Model	2SLS
C&I loan spread	−0.304	0.003	−0.240	−0.738***	−0.753***	0.021
	(0.136)	(0.976)	(0.272)	(0.005)	(0.002)	(0.840)
IPO volume	0.146**	0.137**	0.173**	0.261***	0.284***	−0.006
	(0.038)	(0.050)	(0.042)	(0.006)	(0.003)	(0.935)
Recession	−0.023	−0.034	−0.060	−0.087	−0.068	−0.015
	(0.822)	(0.713)	(0.584)	(0.495)	(0.527)	(0.910)
Different state	0.003	0.000	−0.012	0.016	0.006	−0.000
	(0.915)	(0.989)	(0.689)	(0.660)	(0.877)	(0.993)
Foreign acquirer	0.067	0.095	0.126	0.014	0.016	0.013
	(0.388)	(0.243)	(0.138)	(0.870)	(0.848)	(0.878)
Inverse Mills ratio		−0.141**			−0.148**	
		(0.047)			(0.034)	
Constant	0.373	−0.370	−0.029	0.681	0.791*	0.051
	(0.316)	(0.182)	(0.944)	(0.182)	(0.081)	(0.863)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Endogeneity test *p*-value			0.033			0.074
Over-identification test *p*-value			0.118			0.848
Observations	1,433	1,433	1,433	733	733	733
Adjusted *R*-squared	0.080			0.094		

Notes: This table reports results from OLS, Heckman treatment-effect model, and 2SLS regressions in which the dependent variable is *Average acquisition premium*. The full sample consists of completed acquisitions of private U.S. firms during the period 1993–2010 for which SDC reports enough data to compute acquisition premium. For both the treatment effect and 2SLS regressions in model 1 (2), we use *Prevalence of seller adviser* (*Prevalence of top-tier seller adviser*) and the dummy variable *Close to financial advisers* as instruments. Regressions for model 1 are estimated using the full sample of deals involving private sellers; regressions for model 2 are estimated using the subsample of deals in which private sellers use M&A advisers. Each treatment effect regression includes the *inverse Mills ratio* as an explanatory variable. We use the first-stage probit regression model in Table 4 to calculate the inverse Mills ratios. In 2SLS regression models, we use the same covariates as those in OLS regressions, but instrument *Seller adviser* and *Top-tier seller adviser*. *p*-values are reported in parentheses below coefficient estimates; *p*-values are based on heteroskedasticity-adjusted standard errors. The *p*-value for the endogeneity test is based on the Durbin–Wu–Hausman test. The *p*-value for the over-identification test is based on the Sargan–Hansen test. Variables are defined in Appendix A. The superscripts ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

seller, *Cash* and *Acquirer adviser* (*IPO volume*), indicating that the incremental effects of these variables on acquisition premiums are negative (positive) in the full sample. For subsidiary sellers, the negative valuation effect of greater information asymmetry appears to dominate any positive effect from greater financial sophistication of the parent firm. The results are similar for model 2, except that there is also a significantly negative effect of *Seller ROA and C&I loan spread* in this subsample.

6.2.3. *Endogenous switching regressions*

Table 6 reports the results from endogenous switching regressions. This regression is a generalization of the Heckman (1979) two-stage treatment effect model (see, e.g., Maddala, 1983).[21] It allows certain firm- and deal-specific characteristics to affect acquisition valuations of private sellers with and without advisers differently. As in the treatment effect model, the first-stage regression of the switching model is the probit model from Table 4. The treatment effect model uses only one second-stage equation. Having a single second-stage equation assumes that the impact of a given firm- or deal-specific characteristic on acquisition premium is the same for private sellers that use advisers and those that do not. In the switching regression model, we relax this assumption by estimating two separate second-stage equations: one each for the group of sellers that hire advisers and those that do not.

One benefit of using an endogenous switching regression is that it allows us to perform "what-if" analyses. What would the acquisition premium have been, on average, if a private seller that hires an M&A adviser had chosen not to use an adviser? And what would have been the acquisition premium, on average, if a private seller that does not use an adviser had chosen to use one? For each deal, we compute the improvement, defined as the difference between the actual and the hypothetical acquisition premiums. The hypothetical acquisition premium is the predicted value of the acquisition premium for a firm had it made the opposite choice regarding its use of an M&A adviser. For each observation, we calculate a hypothetical acquisition premium as the sum of the products from multiplying the values of the independent variables for that deal by the respective coefficient estimates from the regression for the subsample of private sellers that make the opposite choice about advisers. The table reports the mean value of these hypothetical acquisition premiums for each subsample.

Panel A in Table 6 reports the second-stage coefficient estimates, and Panel B reports the results of "what-if" analyses. Consistent with the hypothesis that private sellers hire advisers to respond to concerns about their acquisition valuations, in model 1 of Panel A, the estimated coefficient of the *inverse Mills ratio* is negative (positive) for the subsample with (without) seller adviser, although only the latter is statistically significant at the 10%

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[21] Prior studies in finance use this model to analyze underwriter compensation, bond pricing, and bidder announcement returns (see, e.g., Dunbar, 1995; Fang, 2005; Golubov *et al.*, 2012). We follow Golubov *et al.*'s implementation of this model. See their Appendix B for technical details on model specifications and what-if analyses.

level. In model 1 of Panel B, the actual acquisition premium is about -18% for the average private seller that uses an M&A adviser. The hypothetical premium, had these sellers chosen not to use advisers, would have been -42%. The improvement of 24% points relative to the counterfactual

Table 6.   Switching regressions of acquisition premium.

	Panel A: Switching Regression Model			
	Dependent Variable: Average Acquisition Premium			
	Model 1: All Deals		Model 2: Deals with Sell-Side Advisers	
	Seller Adviser	No Seller Adviser	Top-tier Seller Adviser	Lower-tier Seller Adviser
Ln(Acquirer total assets)	−0.041***	−0.037***	−0.034	−0.031**
	(0.005)	(0.010)	(0.244)	(0.037)
Seller ROA	−0.074**	−0.005	−0.121**	−0.070**
	(0.015)	(0.869)	(0.035)	(0.031)
Ln(Deal value)	0.020	0.004	−0.010	0.007
	(0.345)	(0.878)	(0.826)	(0.781)
Public acquirer	−0.045	0.050	−0.254	0.032
	(0.683)	(0.674)	(0.208)	(0.820)
Subsidiary	−0.113***	−0.144***	−0.130*	−0.117***
	(0.002)	(0.001)	(0.070)	(0.010)
Same industry	0.014	0.036	−0.005	−0.001
	(0.702)	(0.353)	(0.951)	(0.987)
Cash	−0.036	−0.079**	−0.085	−0.045
	(0.338)	(0.040)	(0.272)	(0.329)
Acquirer adviser	−0.083*	−0.062	−0.245**	−0.042
	(0.083)	(0.246)	(0.032)	(0.354)
Top-tier acquirer adviser	0.002	0.049	0.068	0.008
	(0.966)	(0.577)	(0.396)	(0.898)
C&I loan spread	−0.707***	0.159	−0.498	−1.013***
	(0.004)	(0.609)	(0.355)	(0.000)
IPO volume	0.285***	0.090	0.590**	0.225**
	(0.002)	(0.410)	(0.020)	(0.031)
Recession	−0.097	0.067	−0.135	−0.007
	(0.363)	(0.696)	(0.595)	(0.955)
Different state	0.018	−0.004	−0.173*	0.011
	(0.620)	(0.925)	(0.096)	(0.793)
Foreign acquirer	0.031	0.364*	−0.238*	0.096
	(0.722)	(0.073)	(0.067)	(0.417)
Inverse mills ratio	−0.163	0.202*	−0.257*	0.187*
	(0.164)	(0.085)	(0.093)	(0.092)
Constant	1.002**	−0.721	1.096	1.127**
	(0.028)	(0.262)	(0.250)	(0.031)
Observations	733	700	213	520

Table 6.   (*Continued*)

Panel B: What-if Analysis

| | Dependent Variable: Average Acquisition Premium | | | |
| | Model 1: All Deals | | Model 2: Deals with Sell-Side Advisers | |
	Seller Adviser	No Seller Adviser	Top-tier Seller Adviser	Lower-tier Seller Adviser
Actual acquisition premium	−0.177	−0.204	−0.232	−0.155
Hypothetical acquisition premium	−0.420	−0.012	−0.391	0.392
Improvement when using adviser or top-tier adviser	0.243	0.191	0.160	0.547
p-value	0.000	0.000	0.000	0.000

Notes: The table reports the second-stage results from switching regressions in which the dependent variable is *Average acquisition premium*. The full sample consists of completed acquisitions of private U.S. firms during the period 1993–2010 for which SDC reports enough data to compute acquisition premium. In model 1, one regression is estimated using the subsample of deals in which private sellers use M&A advisers, and the other using the subsample of deals where they do not use M&A advisers. In model 2, one regression is for the subsample of private sellers that use top-tier M&A advisers, and the other is for the subsample where they use lower-tier advisers. We use the first-stage probit regression models in Table 4 to calculate the inverse Mills' ratios. Panel A reports coefficient estimates, followed below by their *p*-values in parentheses; *p*-values are based on heteroskedasticity-adjusted standard errors. Panel B compares the actual acquisition premiums and their hypothetical counterparts based on "what-if analyses" based on the results reported in Panel A. The hypothetical acquisition premium is what the premium would be if the opposite choice of advisers is made, that is, the product of the independent variables and the coefficient estimates for the regressions for the subsample of firms that make the opposite choice of M&A adviser. The improvement equals the premium when using an adviser (top-tier adviser) minus the premium when not using an adviser (top-tier adviser). Variables are defined in Appendix A. The superscripts ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

premium is statistically significant, with a *p*-value less than 0.001. For sellers that don't hire an adviser, the actual acquisition premium is about −20%. The premium would have been about 19% points higher for them had they hired an adviser, a difference that is highly statistically significant. This result from the switching regression model is consistent with the results from the treatment effect and 2SLS models in Table 5. Overall, the results from all three models suggest that while the selection effect of the decision to use advisers is negative for private sellers, the treatment effect of this choice is positive. In other words, private sellers that decide to use advisers would have received lower acquisition premiums had they not used an adviser, and the use of an adviser improves their valuations. For private sellers that do not use

advisers, our estimates from switching regressions imply that their premiums would also have been higher had they used advisers.

For the group of private sellers that use advisers (i.e., model 2) in Panel A, the estimated coefficient of the *inverse Mills ratio* is significantly negative (positive) for the subsample that uses top-tier (lower-tier) advisers, suggesting that private sellers with greater valuation concerns are more likely to employ top-tier advisers. The estimates in Panel B suggest that the premium would have been 16% lower (55% higher) for sellers that hire top-tier (lower-tier) advisers compared with the contrary choice. Both estimates are statistically significant at the 1% level. Overall, these findings are consistent with the idea that hiring advisers, and especially more reputed advisers, helps sellers obtain better M&A deals.

6.2.4. *Matching methods*

The last two methods that we use are AIM and PSM, which control for potential selection bias based on observable firm- and deal-specific characteristics, and do not rely on IVs. Private sellers decide whether to hire advisers, and whether to use top-tier advisers, based on the sellers' firm- and deal-specific characteristics. Both matching methods control for selection bias and estimate the average treatment effect (ATE), i.e., the effect of using advisers on private targets' acquisition premiums. We follow Abadie and Imbens's (2006) bias-corrected estimation method to calculate the ATE under the AIM method. For the PSM method, we use the probit regression for model 1 in Table 4 to calculate the propensity score for each firm and match each private seller that uses an adviser to the private seller that has the closest propensity score among sellers that do not use advisers. For model 2, using the subsample of deals in which private sellers hire advisers, we match each private seller that uses a top-tier adviser to the private seller that has the closest propensity score among sellers that use lower-tier advisers. The ATE is the difference between the actual mean of the treated and its counterfactual mean.

Table 7 shows the ATE of private sellers that use advisers. In row 1, under both the AIM and PSM methods, the ATE for *Average acquisition premium* for private sellers is positive and statistically significant for using advisers. The incremental acquisition premium from using an adviser is 5.4% (6%) under the AIM (PSM) approach. Given that a private seller has chosen to hire an M&A adviser, the ATE for the acquisition premium for using a top-tier adviser is positive but statistically insignificant under both methods.

Table 7. ATE of using sell-side M&A advisers on acquisition premiums and acquirer announcement returns.

Model	ATE	Abadie–Imbens Matching		Propensity Score Matching	
		Coef.	*p*-value	Coef.	*p*-value
	Acquisition premium:				
1	Seller adviser versus no seller adviser	0.054	0.074	0.060	0.058
2	Top-tier seller adviser versus lower-tier seller adviser	0.002	0.968	0.032	0.834
	Acquirer CAR $(-1, +1)$:				
1	Seller adviser versus no seller adviser	0.006	0.341	−0.005	0.459
2	Top-tier seller adviser versus lower-tier seller adviser	0.017	0.288	0.003	0.868

Notes: The table shows the ATE that a (top-tier) sell-side M&A adviser has on *Average acquisition premium* and *Acquirer announcement returns* in deals involving private sellers, using AIM and PSM. AIM is Abadie *et al.*'s, (2004) method of bias-adjusted matching. For both AIM and PSM, we use all of the explanatory variables from the probit regressions in Table 4. The full sample consists of completed acquisitions of private U.S. firms during the period 1993–2010 for which SDC reports enough data to compute acquisition premium. In model 1, we estimate the ATE of hiring an M&A adviser using the full sample of deals involving private sellers. In model 2, we estimate the ATE of hiring a top-tier M&A adviser using the subsample of deals in which private sellers use an M&A adviser.

6.3. *Do private sellers pay higher fees when using top-tier M&A advisers?*

Golubov *et al.* (2012) find that bidders pay higher advisory fees for the services of top-tier buy-side advisers because acquirers benefit more from using top-tier, rather than lower-tier, advisers. Their findings are consistent with the predictions of IB reputation theory (see, e.g., Chemmanur and Fulghieri, 1994).[22] Because we find that private sellers receive higher acquisition premiums when using top-tier advisers, we examine whether they pay higher advisory fees when they hire top-tier advisers. Our empirical model of sell-side advisory fees is based on Golubov *et al.*'s model of acquirers' buy-side advisory fee.

Table 8 presents the results from OLS, treatment effect, and 2SLS regressions in which the dependent variable is *Seller adviser fee*. The first-stage regression for the treatment effect (2SLS) model is the probit (OLS) regression for model 2 in Table 4. Selection bias does not appear to be an issue in our analysis of seller adviser fees; in Table 8, the coefficient estimate for

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[22] Chemmanur *et al.* (2019) find that buy-side advisory fee is positively related to the experience of the investment banking team, consistent with Chemmanur and Fulghieri's (1994) prediction.

the *inverse Mills ratio* is statistically insignificant in the treatment effect regression, and the *p*-value from the endogeneity test is 0.415 in the 2SLS model. The results from the OLS, treatment effect, and 2SLS regressions are largely consistent. The estimated coefficient for *Top-tier seller adviser* is positive but statistically insignificant in each of the three regressions in Table 8. The results in Table 8 indicate that private sellers do not pay significantly higher advisory fees when they hire top-tier advisers. A caveat about our finding is that SDC reports the advisory fees paid by private sellers for 200, or about 13%, of the 1,554 deals in our sample with sell-side advisers. Advisory fee data is not available for most deals because buyers and sellers usually do not disclose the M&A advisory fees that they pay.[23]

Table 8.   Regressions of seller adviser fees.

	Dependent Variable: Seller Adviser Fee		
	OLS	Treatment Effect Model	2SLS
Top-tier seller adviser	0.031	0.027	0.110
	(0.244)	(0.390)	(0.232)
Ln(Deal value)	−0.014	−0.014**	−0.026
	(0.193)	(0.015)	(0.202)
Subsidiary	−0.010	−0.011	0.017
	(0.532)	(0.533)	(0.365)
Same industry	−0.018	−0.019	−0.003
	(0.298)	(0.194)	(0.752)
Cash	0.070	0.071***	0.035
	(0.364)	(0.010)	(0.337)
Acquirer using adviser	0.007	0.007	0.008
	(0.493)	(0.577)	(0.334)
Top-tier acquirer adviser used	0.026	0.026	0.019
	(0.299)	(0.127)	(0.375)
C&I loan spread	0.037	0.034	−0.007
	(0.533)	(0.718)	(0.747)
IPO volume	−0.005	−0.005	−0.004
	(0.638)	(0.818)	(0.612)
Recession	−0.079	−0.081	0.016
	(0.471)	(0.483)	(0.511)
Different state	0.006	0.006	0.008
	(0.385)	(0.572)	(0.310)
Foreign acquirer	−0.036	−0.034	0.021
	(0.638)	(0.635)	(0.465)

[23] In addition, our results on the advisory fees paid by private sellers could be biased due to the self-selection issues that can result from voluntarily disclosed data. But this caveat also applies to prior analyses of acquirers' advisory fees. McLaughlin (1990) discusses that advisory fees are not always disclosed because the SEC does not require this disclosure even for deals involving public targets and public acquirers.

Table 8. (*Continued*)

	OLS	Treatment Effect Model	2SLS
		Dependent Variable: Seller Adviser Fee	
Inverse Mills ratio		0.004	
		(0.434)	
Constant	0.028	0.028	0.085
	(0.754)	(0.868)	(0.227)
Year and industry fixed effects	Yes	Yes	Yes
Endogeneity test *p*-value			0.415
Over-identification test *p*-value			0.534
Observations	200	200	200
Adjusted *R*-squared	0.074		

Notes: This table reports results from OLS, Heckman treatment-effect model, and 2SLS regressions in which the dependent variable is *Seller adviser fee*. This fee equals the total advisory fees paid by the seller, excluding financing fees, divided by *Deal value*. The sample consists of completed acquisitions for private U.S. firms using advisers during the period 1993–2010 for which SDC reports seller adviser fees. For both the treatment effect and 2SLS regressions, we use *Prevalence of top-tier seller adviser* and the dummy variable *Close to financial advisers* as the instruments. The treatment effect regression includes the *inverse Mills ratio* as an explanatory variable. We use the first-stage probit regression model in Table 4 to calculate the inverse Mills ratios. In the 2SLS regression models, we use the same covariates as those in the OLS regressions, but instrument *Seller adviser* and *Top-tier seller adviser*. *p*-values are reported in parentheses below coefficient estimates; *p*-values are based on heteroskedasticity-adjusted standard errors. The *p*-value for the endogeneity test is based on the Durbin–Wu–Hausman test. The *p*-value for the over-identification test is based on the Sargan–Hansen test. Variables are defined in Appendix A. The superscripts *** and ** denote statistical significance at 1% and 5% levels, respectively.

6.4. *Do acquirers experience lower announcement returns when private sellers use M&A advisers?*

Finally, we examine the impact of private sellers' use of advisers on the announcement returns of their public acquirers. Given that an M&A transaction is an outcome of bargaining between two parties and our finding that acquirers pay higher acquisition premiums for private sellers that use advisers and top-tier advisers, we might expect acquirers to experience lower shareholder wealth gains upon announcement of acquisitions of private sellers that use advisers.

Table 9 reports the results from OLS, treatment effect, and 2SLS regressions in which the dependent variable *is Acquirer CAR* (−1, +1).[24]

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[24] *CAR* (−1, +1) is the cumulative abnormal return, computed as the sum of daily abnormal returns over trading days (−1, +1), where day 0 is the announcement date. The abnormal return for day *t* equals the rate of return on a firm's common stock on trading day *t* minus the CRSP value-weighted market index return on trading day *t*.

As in Sec. 6.2.2, the first-stage regression for each model in the treatment effect (2SLS) regression is the probit (OLS) regression for the corresponding model in Table 4. The regressions in model 1 use the full sample; the regressions in model 2 use the subsample of private sellers that hire advisers. The regressions include independent variables that previous studies have found to be significant determinants of acquirer CARs. Officer *et al.* (2009) find that acquisition premiums paid for private sellers are negatively related to acquirers' CARs, so we include *Average acquisition premium* as an explanatory variable in the regressions in Table 9. For brevity, we limit our

Table 9.   Regressions of acquirer announcement returns.

| | Dependent Variable: Acquirer CAR $(-1, +1)$ | | | | | |
| | Model 1: All Deals | | | Model 2: Deals with Sell-side Advisers | | |
	OLS	Treatment Effect Model	2SLS	OLS	Treatment Effect Model	2SLS
Seller adviser	0.003	−0.071*	−0.055			
	(0.578)	(0.080)	(0.511)			
Top-tier seller adviser				0.012	0.018	−0.005
				(0.283)	(0.586)	(0.932)
Acquisition premium	−0.011	−0.011	−0.012	−0.028**	−0.030***	−0.031***
	(0.144)	(0.101)	(0.112)	(0.024)	(0.001)	(0.008)
Ln(Acquirer total assets)	−0.008***	−0.004	−0.007	−0.008**	−0.008**	−0.007**
	(0.001)	(0.237)	(0.126)	(0.020)	(0.017)	(0.029)
Seller ROA	−0.003	−0.008	−0.007	−0.015*	−0.017**	−0.017**
	(0.608)	(0.124)	(0.337)	(0.088)	(0.011)	(0.044)
Ln(Deal value)	0.002	0.005*	0.006	0.001	0.001	0.002
	(0.626)	(0.089)	(0.306)	(0.892)	(0.863)	(0.727)
Subsidiary	0.004	0.007	0.008	0.001	−0.001	−0.001
	(0.596)	(0.326)	(0.296)	(0.902)	(0.942)	(0.912)
Same industry	−0.002	−0.001	−0.003	−0.012	−0.008	−0.008
	(0.709)	(0.825)	(0.638)	(0.185)	(0.338)	(0.396)
Cash	0.004	0.004	0.004	0.016*	0.010	0.012
	(0.567)	(0.555)	(0.483)	(0.091)	(0.337)	(0.216)
Acquirer adviser	−0.007	0.002	−0.002	−0.008	−0.006	−0.003
	(0.317)	(0.857)	(0.900)	(0.493)	(0.558)	(0.803)
Top-tier acquirer adviser	0.008	0.016	0.015	0.009	0.003	0.004
	(0.427)	(0.111)	(0.232)	(0.507)	(0.809)	(0.728)
C&I loan spread	0.021	−0.005	−0.003	0.058	0.048	−0.014
	(0.643)	(0.783)	(0.870)	(0.357)	(0.410)	(0.638)
IPO volume	0.018	0.013	0.014	0.039	0.039*	0.045*
	(0.299)	(0.418)	(0.519)	(0.171)	(0.085)	(0.070)
Recession	−0.036	−0.032	−0.036	−0.038	−0.039	−0.045
	(0.168)	(0.141)	(0.155)	(0.210)	(0.122)	(0.126)
Different state	−0.008	−0.007	−0.006	−0.007	−0.007	−0.005
	(0.269)	(0.252)	(0.367)	(0.521)	(0.476)	(0.634)

Table 9.   (*Continued*)

	Dependent Variable: Acquirer CAR $(-1, +1)$					
	Model 1: All Deals			Model 2: Deals with Sell-side Advisers		
	OLS	Treatment Effect Model	2SLS	OLS	Treatment Effect Model	2SLS
Foreign acquirer	0.030	0.021	0.023	0.020	0.021	0.019
	(0.122)	(0.427)	(0.315)	(0.313)	(0.434)	(0.364)
Inverse Mills ratio		0.044			−0.004	
		(0.035)			(0.412)	
Constant	0.030	0.050	0.053	−0.044	−0.022	0.061
	(0.727)	(0.424)	(0.440)	(0.684)	(0.837)	(0.492)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Endogeneity test p-value			0.488			0.756
Over-identification test p-value			0.454			0.180
Observations	1,307	1,307	1,307	680	680	680
Adjusted R-squared	0.084			0.136		

Notes: This table reports results from OLS, Heckman treatment-effect model, and 2SLS regressions for the cumulative abnormal returns of public acquirers around the announcement dates of acquisitions. *CAR* $(-1, +1)$ equals the sum of daily abnormal returns over trading days $(-1, +1)$, where day 0 is the announcement date. The abnormal return for day t equals the return on a stock on trading day t minus the corresponding return on the CRSP value-weighted market index. The full sample consists of completed acquisitions of private U.S. firms during the period 1993–2010 for which SDC reports enough data to compute acquisition premium. For both the treatment effect and 2SLS regressions in model 1 (2), we use *Prevalence of seller adviser* (*Prevalence of top-tier seller adviser*) and the dummy variable *Close to financial advisers* as instruments. Regressions in model 1 are estimated using the full sample of deals involving private sellers; regressions in model 2 are estimated using the subsample of deals in which private sellers use M&A advisers. Treatment effect regressions include the inverse Mills ratio as an explanatory variable. We use the first-stage probit regression in Table 4 to calculate the inverse Mills ratios. In 2SLS regressions, we use the same covariates as those in the OLS regressions, but instrument *Seller adviser* and *Top-tier seller adviser*. p-values are reported in parentheses below coefficient estimates and are based on heteroskedasticity-adjusted standard errors. The p-value for the endogeneity test is based on the Durbin–Wu–Hausman test. The p-value for the over-identification test is based on the Sargan–Hansen test. Variables are defined in Appendix A. The superscripts ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

discussion of the independent variables in Table 9 to the variables of primary interest: *Seller adviser, Top-tier seller adviser,* and *Average acquisition premium.*

In the OLS regression for model 1 in Table 9, the coefficient estimate of *Average acquisition premium* is statistically insignificant. In the treatment effect regression in model 1, the coefficient estimate of the *inverse Mills ratio* is positive and statistically significant at the 5% level, suggesting that the decision to use advisers by private sellers is endogenous to acquirer CARs. The positive coefficient estimate of the *inverse Mills ratio* suggests that private sellers with certain firm- and deal-specific attributes that are likely to result in higher acquirer CARs are more likely to retain advisers.

After controlling for this selection effect, the coefficient estimate of *Seller adviser* is significantly negative, suggesting that the use of advisers by private sellers tends to result in lower CARs for acquirers. The estimated magnitude of this effect is -7.1%. In the 2SLS model, the *p*-value of the endogeneity test is 0.488, suggesting that this model is inappropriate here. The estimated coefficient of *Average acquisition premium* is negative, but statistically insignificant. In Table 7, under both matching methods, the ATE of the use of sell-side advisers on acquirer CARs is statistically insignificant. Overall, there is only slight evidence that the use of an adviser by a private seller results in lower announcement returns to acquirers.

Potential selection bias does not appear to be a concern in model 2. The coefficient estimate of the *inverse Mills ratio* is statistically insignificant, and the *p*-value of the endogeneity test for the 2SLS regression is 0.756. The coefficient estimate of *Average acquisition premium* is negative and statistically significant, while the estimated coefficient of *Top-tier seller adviser* is statistically insignificant. The ATE of the use of top-tier seller advisers is also insignificant in Table 7 under both matching methods. These results suggest that the hiring of top-tier advisers by private sellers does not significantly affect acquirer CARs. The use of top-tier advisers by private sellers appears to only affect acquirer CARs through higher acquisition premiums, i.e., smaller valuation discounts, received by private sellers.

7. Conclusions

This paper investigates the determinants of private sellers' use of M&A advisers and top-tier advisers and the effects that these advisers have on the outcomes of deals involving private sellers. We find that private-sellers' decisions on whether to hire advisers and whether to pick top-tier rather than lower-tier advisers appear to be driven by factors that affect their acquisition premiums. After accounting for this selection effect via several econometric approaches and controlling for other factors, we find that private sellers that hire advisers receive significantly higher acquisition premiums. Among private sellers that hire advisers, we find that sellers that hire top-tier advisers receive higher acquisition premiums. Given limited availability of adviser fee data, we cannot draw conclusions on the net benefit of hiring advisers for private sellers. We find some evidence that the presence of sell-side advisers in deals involving private sellers has a negative effect on announcement returns to acquirers, consistent with the idea that advisers increase the bargaining power of private sellers. But conditional on the hiring of an M&A adviser by a

private seller, the impact that a top-tier adviser has on announcement returns to acquirers appears to be primarily due to the higher premiums that private sellers receive when they use more reputable advisers. Overall, our findings suggest that M&A advisers, especially top IBs, can find and negotiate better deals for private sellers.

Acknowledgments

Appendix A. Variable Definitions

Variable	Definition
Panel A: Valuation discount variables	
Excess deal value multiple	$(A - B)/B$, where A is a deal value multiple for a private seller, and B is the corresponding average multiple for the portfolio of public sellers with the same primary two-digit SIC code as the private seller, deal value within $\pm 20\%$ of the private seller deal, and announcement date within ± 1.5 calendar years of the private seller deal announcement. If there is no match, we relax the deal value restriction to 30%, 40%, or 50%, as necessary. We match with replacement of public sellers. We use four deal value multiples: *Deal value* to *either Sales* or *EBITDA* or *net earnings* or book value of equity.
Average acquisition premium	The average of all available excess deal value multiples for a private seller
Panel B: Deal characteristics	
Deal value	The price paid to the seller's shareholders plus liabilities assumed by the acquirer

(*Continued*)

Variable	Definition
Cash	Dummy variable that equals one if the method of payment is cash, and zero otherwise
Same industry	Dummy variable that equals one if the seller has the same two-digit SIC code as the acquirer, and zero otherwise
Days to deal completion	Number of days from the announcement date of a deal to its completion date
Panel C: Seller characteristics	
Seller ROA	The net earnings of the seller divided by its total assets for the last fiscal year ending before the announcement date of the acquisition, winsorized at the top and bottom by 1%
Subsidiary seller	Dummy variable that equals one if the seller is a subsidiary, and zero if the seller is a stand-alone firm
Seller adviser	Dummy variable that equals one if the seller hires an M&A adviser, and zero otherwise
Top-tier seller adviser	Dummy variable that equals one if a seller hires a top-tier IB as an M&A adviser, and zero otherwise
Seller advisory fee	The advisory fee paid by a seller scaled by deal value
Panel D: Acquirer characteristics	
Acquirer market value	Market value of equity of an acquirer one month before the announcement date of the acquisition
Acquirer total assets	Acquirer's total asset for the fiscal year prior to the acquisition announcement
Public acquirer	Dummy variable that equals one if the acquirer is a publicly traded firm, and zero otherwise
Acquirer CAR $(-1, +1)$	Sum of daily abnormal returns over trading days $(-1, +1)$, where day 0 is the announcement date. The abnormal return for day t equals the rate of return on a firm's common stock on trading day t minus the value-weighted market index return on trading day t
Acquirer adviser	Dummy variable that equals one if an acquirer retains an adviser, and zero otherwise
Top-tier acquirer adviser	Dummy variable that equals one if an acquirer uses a top-10 adviser, and zero otherwise
Panel E: Other control variables	
C&I loan spread	The four-quarter moving average of the spread of commercial and industrial (C&I) loan rates over the federal funds rates
IPO volume	The four-quarter moving average of the number of IPOs per quarter scaled by the number of firms listed on CRSP at the beginning of the quarter
Recession	A dummy variable that equals one if the acquisition is announced during a recession period, as defined by the NBER, and zero otherwise
Different state	A dummy variable that equals one if the seller and the acquirer are not in the same state, and zero otherwise

(*Continued*)

Variable	Definition
Foreign acquirer	A dummy variable that equals one for a non-U.S. acquirer, and zero otherwise
Prevalence of seller adviser	Proportion of private seller firms in the same two-digit SIC industry that have used a financial adviser in the year prior to acquisition announcement
Prevalence of top-tier seller adviser	Proportion of private seller firms in the same two-digit SIC industry that have used a top-tier financial adviser in the year prior to acquisition announcement
Close to financial advisers	A dummy variable that equals one for sellers located in New York, New Jersey, California, Illinois, or Massachusetts, and zero otherwise

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