The Role of Investment Banks in Acquisitions

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We compare acquisitions completed with and without investment bank advice over the 1981 to 1992 period. We find that the choice to use an investment bank depends on the complexity of the transaction, the type of transaction (takeovers versus acquisitions of assets), the acquiror's prior acquisition experience, and the degree of diversification of the target firm. Although acquisition announcement returns are lower for firms using investment banks, this difference can be explained by differences in transaction characteristics. These results suggest that transaction costs are the main determinant of investment banking choice, followed by contracting costs and asymmetric information costs.

Although acquisitions have been studied in much detail, there is little evidence on the role played by investment banks in these transactions. Nevertheless, the common belief is that investment banks fulfill an important function in the acquisition process, justifying fees that average close to 1% of the amount of the transaction. *Mergers and Acquisitions* reports that over the period 1985 to 1993 the total investment banking fees for 1,558 transactions amounted to $5.5 billion, an average of 0.85% of the total dollar value of the transactions, or about $3.5 million per acquisition.[1]

The belief that investment banks are important in the acquisition process has not remained unchallenged. In fact, *Business Week* has detailed a number of transactions where companies used their in-house investment banking services to issue securities and advise on takeovers, transactions for which companies traditionally use an investment banking intermediary (see "Corporate America's End Run," *Business Week*, November 5, 1990, 124–126).

To gain a better understanding of the role fulfilled by investment banks in the acquisition process, we examine 99 acquisitions over the 1981 to 1992 period in which the bidding firm does not use the advisory services of an investment bank (henceforth, "in-house acquisitions"), and compare them to a sample of acquisitions for which investment bank advice is used. Since there is little theoretical work on the determinants of the investment banking choice in acquisitions, our analysis is of an exploratory nature. We do, however, propose three hypotheses in our investigation. The first of these is the transaction costs hypothesis, which posits that investment banks can analyze acquisitions at a lower cost than other firms. The second is the asymmetric information hypothesis, which posits that investment banks reduce the information asymmetry between target firms and acquirors. Finally, the contracting hypothesis posits that investment banks reduce agency costs in the acquiring firm when they certify the value of an acquisition. In addition, we investigate whether these theories can explain the decision to use a first-tier rather than a second-tier investment bank. We also examine the wealth effects of acquisitions completed with and without investment bank advice and analyze the run-up in the target firm's stock price prior to the acquisition announcement.

The role of investment banks as intermediaries in other capital markets transactions has been scrutinized in some detail. Smith (1977) compares underwritten offerings, where an investment bank is used, to rights offerings, which can be completed without investment bank

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[1] McLaughlin (1990) reports average total investment banking fees of 1.29% of the amount of the transaction for tender offers over the 1978 to 1985 period.

involvement. Scholes and Wolfson (1989) examine companies that use discount dividend reinvestment and stock purchase plans to raise additional funds from their shareholders, instead of relying on an underwriter. Beatty and Ritter (1986), Carter and Manaster (1990), and Johnson and Miller (1988) describe how investment bank reputation relates to underpricing of initial public offerings. In a similar vein, Titman and Trueman (1986) show that higher-valued firms choose a higher-quality investment banker (or auditor) when they take the firm public.

Bowers and Miller (1990), Hunter and Walker (1990), and McLaughlin (1990, 1992) study the role of investment banking contracts and reputation in acquisitions. McLaughlin (1990) reports that some features of investment banking contracts can create conflicts of interest between an investment bank and its clients. In his sample, the investment banking fees in 95% of the contracts with bidding firms increase if the takeover is successful. This type of contract design can lead investment banks to suggest higher premiums to get the deal done.

Hunter and Walker (1990) examine a sample of 126 U.S. corporate mergers over the 1979 to 1985 period. They find that merger gains relate positively to investment bank fees and proxies for investment bank effort. In a similar vein, Bowers and Miller (1990) examine the relation between acquiror stock returns and the choice of investment bank. More specifically, they examine whether first-tier investment banks broker better acquisitions in terms of value creation. They report that total wealth gains are larger when either the target or the bidder uses a first-tier investment bank.

In this article, we find some support for the three hypotheses of investment bank choice in acquisitions. Consistent with the transaction costs hypothesis, acquiring firms are more likely to use an investment bank when the acquisition is more complex and when they have less prior acquisition experience. Consistent with the asymmetric information hypothesis, acquiring firms are more likely to use an investment bank when the target operates in many different industries. Consistent with the contracting costs hypothesis, acquiring firms are more likely to use an investment bank when they purchase publicly traded companies instead of assets of other firms, and when they have lower insider ownership. The latter result is only significant for the subset of takeovers. Regarding the choice between first-tier and second-tier investment banks, we only find support for the transaction costs hypothesis.

We also document that acquiring firm abnormal returns are lower when investment banks are used, but this result is caused by the sample of acquisitions of units. Moreover, this result disappears after controlling for the characteristics of the transaction. Investment bank

quality (first-tier versus second-tier) does not, however, affect abnormal returns. For takeovers, we also examine the stock price run-up preceding an acquisition and find no significant difference between in-house and investment bank assisted transactions.

The remainder of this article is structured as follows. In Section 1 we discuss the investment banking function in acquisitions in more detail and develop our hypotheses. In Section 2 we describe the data collection procedure. We present our analysis on the investment banking decision in Section 3 and on acquisition-related wealth effects and stock price run-ups in Section 4. We provide concluding remarks in Section 5.

1. Investment Banks and Mergers and Acquisitions

In this section, we develop the hypotheses that guide our empirical analysis and construct the proxies used to test these hypotheses. First, we discuss how investment banks can (1) value companies and make bids at a lower cost than acquirors; (2) reduce information asymmetries between targets and acquirors; and (3) affect the agency problems between the acquiring firm, its managers, and its shareholders. We also address agency problems between the acquiror and its investment bank.

1.1 Determinants of investment banking choice
1.1.1 Transaction costs.   Benston and Smith (1976) argue that transaction costs are the main reason for the existence of financial intermediaries. They identify three reasons why financial intermediaries have a comparative advantage in producing financial commodities: (1) economies of specialization, (2) scale economies in information acquisition, and (3) reduction in search costs. This argument can be extended to explain the use of investment banks in acquisitions; they may be able to identify takeover targets, value them, and put together a bid at a lower cost than individual firms. Therefore, we expect firms to rely more heavily on investment bank advice if a particular offer is likely to entail higher transaction costs.

We use two sets of variables to measure transaction costs. The first set captures the complexity of the transaction, since we expect higher transaction costs when the deal is more complex. We conjecture that hostile takeovers, acquisitions that involve a bidding contest, acquisitions paid with securities, and large transactions are more complex than friendly mergers, single bidder acquisitions, acquisitions paid in cash only, and small transactions. If the acquisition is hostile, the potential suitor needs to avoid takeover defenses, convince shareholders and the board of directors of the appropriateness of the bid, and po-

tentially improve the terms of the bid during the bargaining process. These factors increase the complexity of the acquisition, and as a result they may increase the need for investment bank advice.

In the same vein, when the firm is not the first bidder, it is more important to react faster, thereby increasing the need for investment bank advice. The form of payment also influences the complexity of the transaction. Cash acquisitions are simple in terms of valuation; transactions paid with securities (or a mix of cash and securities), however, require more expertise in putting the package together, valuing it, and possibly issuing the securities.[2] Finally, the size of the acquisition also proxies for the complexity of the transaction. Large companies have more resources to resist an outside bid; in addition, they typically consist of more business units, making valuation more difficult. Therefore, we expect larger acquisitions in the investment bank sample.[3]

The second set consists of the acquiror's prior acquisition experience. More experienced acquirors are able to spread the fixed costs of setting up a mergers and acquisitions group over more transactions. Therefore, they are less likely to need an investment bank when planning an acquisition.

1.1.2 Asymmetric information problems.
We expect the need for investment bank advice to be greater when the information asymmetry between the acquiror and the target is larger. Of course, asymmetric information problems can also be thought of as transaction costs. Because they are of a unique nature when compared to the transaction costs discussed previously, however, we discuss them separately. This classification also facilitates the interpretation of our results.

We use four proxies to capture information asymmetries: (1) industry relatedness; (2) the type of acquisition, that is, a complete takeover, an acquisition of assets, or an acquisition of a partial ownership in-

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[2] The form of payment may also be related to the bidder's private information about its own value, the value of the target, or the potential gains from the acquisition. Fishman (1989), Eckbo, Giammarino, and Heinkel (1990), and Hansen (1987) all propose models where cash is used more often when the private information is positive. This can affect our findings on the relation between investment banking choice and the form of payment.

[3] It is also possible that investment banks become involved in larger acquisitions to provide acquisition-related financing. To examine this conjecture, we gather data on the amount of new financing obtained by the acquirors in our sample over the 12-month period surrounding the acquisition, and on the identity of the lead underwriter. We then relate the issuance of securities to acquisition financing. It is difficult, however, to relate new issues to specific acquisitions, because many of the companies in our sample raise new funds several times in excess of the funds required to complete the acquisition. Thus, with these data we cannot show that investment banks are employed more frequently as advisors by bidding firms because they also provide takeover-related financing. These results are not presented in this article.

terest; (3) the number of industries in which the target operates; and (4) whether or not the eventual acquiror was the first bidder. We expect a greater need for investment bank advice when the acquiror and the target do not operate in the same industry. When a firm considers a target in a related industry, it can rely on its capital budgeting expertise to value the target. A firm cannot rely on this expertise, however, when considering targets in unrelated industries.

We expect firms to need more outside advice when they acquire specific assets of another company than when they purchase an independent company. Whereas detailed financial information on publicly traded companies is easily available, this is not the case for specific assets or units. The investment bank's valuation expertise is more valuable in this case.

Asymmetric information problems are more severe when a target firm operates in several business segments, since it is less likely that the acquiring firm has detailed knowledge of the operations in all segments. This will increase the need for investment bank advice. Finally, we expect that investment banks are less needed when the acquiror is not the first bidder. Part of the task of an investment bank consists of identifying potential takeover targets; if a firm is already "in play," there is no need for this service.[4]

1.1.3 Contracting costs. Easterbrook (1984), Hansen and Torregrosa (1992), Smith (1986), and Titman and Trueman (1986) argue that firms use underwriting services to issue new securities, because investment banks monitor the firm and provide a signal of firm quality to investors. The incentive to monitor stems from the fact that investment banks are liable for misrepresentations in the prospectus. A related monitoring argument can be used to justify paying for the services of an investment bank in an acquisition. Even though the incentives to perform the monitoring function adequately in acquisitions are less direct than in the security issuance process, they are not necessarily less powerful. The value of the investment bank's reputation capital depends on the quality of their advice. Beatty and Ritter (1986) provide evidence for initial public offerings that investment banks lose market share when they fail to correctly underprice these issues.[5]

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[4] As an additional proxy for asymmetric information, we use the standard deviation of the target firm's stock returns. This variable is insignificant in all our models.

[5] There is some anecdotal evidence that losses to reputation capital can be substantial for mergers and acquisitions advisors. Wasserstein, Perella (WP) was Interco's defense advisor when the firm was a takeover target in 1988. Following WP's advice, Interco went through a leveraged recapitalization. Three years later Interco filed for bankruptcy and sued WP for breach of fiduciary duty, professional malpractice, and fraud. WP also advised Campeau on the acquisition of Federated

We use two proxy variables to measure the acquiring firm's need for monitoring. The first variable is the ownership in the acquiring firms by corporate insiders. If insiders own a large stake in the acquiring firm, they are less likely to embark on value reducing corporate acquisitions [e.g., Lewellen, Loderer, and Rosenfeld (1985)]. Therefore, there is less need for monitoring. The second variable is the percentage of independent outside directors on the board of directors. Fama (1980) argues that outside directors on the board of directors act as referees between the shareholders and the managers. Brickley and James (1987) report that the presence of outsiders on the board reduces managerial consumption of perquisites in the banking industry, and Byrd and Hickman (1992) find that firms make better acquisitions when a larger fraction of their board consists of outsiders. These results suggest that outside directors monitor the quality of acquisitions. Thus, we expect less of a need for investment bank advice when insiders own a lot of equity in their firm and when independent outsiders are well represented on the board of directors.[6]

The contracting hypothesis also suggests that the type of acquisition can be related to investment banking choice. If firms engage in a complete takeover, or if they acquire a partial ownership stake in another firm, information about the market price of the target firm is readily available. Therefore, firms should make acquisitions at a premium over the market price only if they lead to synergistic gains. Roll (1986) suggests that managers of bidding firms are subject to hubris, which leads them to rely on their personal valuations, even when there are no synergies, and these valuations exceed the market price. Outcomes of valuations below the market price are not observed, because they do not result in a takeover bid. As such, the distribution of acquisition returns is truncated, which results in a negative stock price reaction when firms announce acquisitions. Conversely, the market price of certain assets of a firm is unavailable and, therefore, all valuations may lead to bids. Hence, we expect firms to rely more on investment bank advice when the potential for making "hubris"-motivated acquisitions is larger, which is the case for takeovers, or acquisitions of a partial ownership interest. In a similar vein, we expect managers to rely more on investment bank advice when the transactions are large, since they are likely to have a more substantial effect on the acquiror's stock price.

Department Stores in May 1988; Federated filed for bankruptcy in 1990. Bad publicity associated with these transactions contributed to WP's decline in the ranking of completed merger deals from third place in 1989 to eighth place in 1990.

[6] Alternatively, it is possible that outsiders on the board request the fairness opinion of an investment bank to protect themselves from shareholder lawsuits. This possibility suggests that firms are more likely to use investment bank advice when more outside directors are represented on the board.

The previous discussion presumes that mechanisms are in place to align the interests of managers and shareholders. That is, when managers own little stock, the board of directors can recommend using the services of an investment bank because external monitoring increases firm value. Similarly, when the board believes that hubris affects managerial judgment, it can employ the services of an investment bank. If managers are not maximizing shareholder wealth, and monitoring mechanisms do not function effectively, managers may seek acquisitions that increase their private benefits, but that are costly to shareholders [Jensen (1986)].[7] If managers are making value-destroying acquisitions, the fairness opinion provided by the investment banks acts as a safeguard against shareholder lawsuits. If this is true, we expect more investment bank assisted acquisitions when the shareholder wealth effects are negative. To further evaluate this conjecture, we also compare acquiror returns in in-house acquisitions to acquiror returns in the investment bank sample.

1.1.4 Summary. Table 1 summarizes the proxies employed to test our three hypotheses. Notice that three variables are used for two different hypotheses: the transaction costs hypothesis suggests that firms are more likely to perform the acquisition with investment bank advice when they are not the first bidder. The asymmetric information hypothesis has the opposite prediction. The contracting costs hypothesis predicts that firms are less likely to use investment bank advice for an acquisition of assets or units of another firm. Again, the asymmetric information hypothesis has the inverse prediction. Both the transaction and contracting costs hypotheses predict that firms are more likely to employ an investment bank for large acquisitions.

1.2 Agency problems between the investment bank and the acquiror

It is possible that investment banks are purely motivated by fee income; in many cases [see McLaughlin (1990)], the investment banking fee contracts do not penalize the acquiror's investment bank when the acquisition price is increased. If this is true and if acquirors are systematically fooled in going along with the deal, we expect the wealth gains of acquirors who complete acquisitions without investment bank advice to be higher and the wealth gains of their targets to be smaller.[8]

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[7] The evidence that the returns to bidders were negative during the 1980s [Bradley, Desai, and Kim (1988), Jarrell, Brickley, and Netter (1988), and Servaes (1991)] is consistent with this interpretation.

[8] McLaughlin (1990) discusses two reasons, however, why the bidders' investment banks may not want to increase the acquisition prices, even if doing so would increase fee income: (1) it would

Table 1
Testable hypotheses of theories predicting a relation between the decision to use an investment bank for an acquisition, and the characteristics of the transaction and the acquiror

Hypothesis	Proxy variable	Hypothesized sign of the relation between the proxy and the decision to use an investment bank for an acquisition
Transaction costs	Complexity of the transaction	
	Target firm resists the acquisition	Positive
	Payment is in cash only	Negative
	Acquiror is not the first bidder	Positive
	Size of the transaction	Positive
	Acquisition experience of the acquiror	
	Number of prior acquisitions	Negative
Information asymmetry	Acquisition is in related industry	Negative
	Number of industries in which the target is active	Positive
	Acquiror is not the first bidder	Negative
	Acquisition of assets	Positive
Contracting costs	Insider ownership	Negative
	Outsiders on the board	Negative
	Size of the transaction	Positive
	Acquisition of assets	Negative
	Market reacts positively to the acquisition	Negative

Another potential problem that firms face when investment banks are involved in the acquisition process is the increased possibility of prebid information leakage. This can drive up the target's stock price and make the acquisition costlier to the acquiror. We analyze the preannouncement run-up in the stock price of the acquisition target to examine this possibility.

2. Data Collection

To evaluate our hypotheses on the role of investment banks in acquisitions, we collect a sample of acquisitions from *Mergers & Acquisitions* (M&A) over the period 1981 to 1992. Since 1981, this magazine has published an annual list of the 100 largest acquisitions, together with the names of the advisors of the acquiror and target and the amount of the transaction.[9] If the identity of the investment advisor

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reduce the value of their reputation capital; and (2) firms do not rely on the investment bank's offer evaluation, that is, they only use the investment bank to identify targets, to gather information, and to structure the deal, once the firm has set the price. He dismisses the second suggestion, however.

[9] Admittedly, an investigation of the 100 largest transactions may not be representative for all transactions. However, the 100 largest acquisitions per year represent over 60% of the dollar value

cannot be determined from public information, the *M&A* staff contact the firms to obtain this information. This inquiry either results in the name of the advisor, the description "in-house" if no investment bank is involved in the transaction, or the description "not available" if the acquiror does not provide the information. We gather data on all transactions for which the acquiring firm does not use investment bank advice. This selection procedure yields a sample of 99 in-house acquisitions.[10]

We also randomly select 198 transactions where the acquiror was assisted by an investment bank. No specific requirements are imposed on this sample, except that its distribution over time is the same as the distribution of the in-house sample. The transactions in both samples include takeovers, acquisitions of assets or units of another firm, as well as acquisitions of a partial ownership interest. Acquisitions of 50% or more of the shares of another firm are classified as takeovers; acquisitions of a portion of the assets of a firm are classified as acquisitions of assets or units; finally, acquisitions of less than 50% of a company's shares are classified as acquisitions of a partial ownership interest. The number of acquisitions performed without investment bank advice fluctuates significantly over the sample period. The percentage of the 100 largest acquisitions performed without investment bank advice ranges from 0% in 1989 and 1990 to 25% in 1981, averaging 9.8%.

To determine whether firms complete transactions in-house on a regular basis, we gather information on the number of different companies that complete in-house transactions. The 99 in-house acquisitions are completed by 88 companies, which averages to 1.13 acquisitions per company.[11] Interestingly, this fraction is exactly equal for the investment banking sample. The 198 acquisitions are completed by 176 different companies. We also count the number of investment bank assisted acquisitions completed by firms in our in-house sample over the sample period. Forty-three of the 88 companies in our in-house sample complete 61 acquisitions with investment banking advice. There is no pattern, however, in the order in which firms complete in-house and investment bank assisted transactions. That is, if a firm completes at least one acquisition in-house and at least

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of all acquisition activity during our sample period. Thus, our findings relate to an economically important fraction of all acquisitions.

[10] In 1983, *M&A* did not ask firms about the use of in-house investment banking services. This explains the absence of in-house transactions for that year. In 1990, the *M&A* top 100 contained several acquisitions for which the identity of the investment banks was not available. It is likely that in-house investment banking services were used in some of these cases.

[11] Five firms completed two transactions each without investment bank advice and two firms completed four transactions each without investment bank advice.

one acquisition with the help of an investment bank, both types of acquisitions are approximately equally likely to occur first.[12]

We gather information on the characteristics of the transactions from the *Wall Street Journal Index (WSJI)* and *M&A*. Acquisitions are classified as hostile if the *WSJI* reports that target firm managers do not approve the acquiror's bid. We also determine from the *WSJI* whether the acquiror in our sample is the first one to make an offer. Finally, an acquisition is classified as a cash only acquisition if it is 100% cash financed.

To measure the previous acquisition experience of an acquiring firm, we identify all acquisitions made by the acquiring firm as listed in the corporate histories of *Moody's Industrial, Transportation, OTC, Bank and Finance, Public Utilities*, and *International* manuals. For every acquiring firm, our measure of acquisition experience is based on the total number of acquisitions made over the 10 years preceding the year of the acquisition in our sample. This information could be compiled for 71 of the in-house acquisitions and 130 of the transactions from the investment bank sample.

Industry information used to classify the acquisitions in a related or unrelated category is obtained from *Dun & Bradstreet's Million Dollar Directory (D&B)*. We concentrate on the first four SIC codes reported for the target and the acquiring firm, and classify an acquisition as related if we find at least one match at the three-digit level between the SIC codes of targets and bidders. A similar classification procedure has been used by Kaplan and Weisbach (1992) and Morck, Shleifer, and Vishny (1990).[13,14] We also gather information from *D&B* on the number of industries in which the target operates. This figure is used as one of our asymmetric information proxies.

We search the proxy statements to obtain information on insider ownership and board composition of the acquiring firm. All officers of the corporation and members of the board are classified as insiders for our measure of insider ownership. Board members are classified into two categories, according to the method used by Baysinger and Butler (1985): (1) Inside directors, who are currently officers of the

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[12] As an alternative control sample, we use the transactions completed with investment bank advice only for those firms who also completed at least one transaction in-house over the sample period. These results are similar to those reported in this article, but their statistical significance is usually weaker, which is not surprising given that there are only 43 companies in this control sample.

[13] For 12 of the targets and acquirors which lack a *Million Dollar Directory* listing, we obtained the SIC codes from *Standard and Poor's Register of Corporations, Directors and Executives*. Because the latter source does not list the SIC codes in order of importance, we use all the reported SIC codes to determine relatedness for these acquisitions.

[14] We also use two- and four-digit SIC code comparisons to determine whether acquisitions are related. These alternative classification procedures do not alter our results. We do not report these results in this article.

corporation, and quasi-inside outside directors who have some professional affiliation with the firm, but who are not currently officers of the corporation; and (2) independent outside directors, who have no professional affiliation with the firm. Our results are qualitatively similar, however, if the fraction of outside directors also includes quasi-inside directors. Information on insider ownership is available for 65 in-house transactions and 119 transactions that involve an investment bank. Similarly, we have information on the composition of the board of directors for 66 in-house transactions and 121 transactions in the investment bank sample.[15]

The announcement dates used to compute the wealth effects associated with the transactions are obtained from the WSJI. Transactions are deleted from tests on the wealth effects if confounding information is released at the time of the acquisition announcement. Market model parameters are estimated over the 200-day period ending 50 days before the initial announcement of the acquisition, using continuously compounded returns from the Center for Research in Security Prices (CRSP) database. The CRSP value-weighted index is used as a proxy for the market. Some of the acquiring firms in our sample are not listed on CRSP or do not have sufficient returns data to compute abnormal returns. Consequently, we compute abnormal returns for 59 (109) acquirors in the in-house (investment bank) sample, and for 60 (120) targets in the in-house (investment bank) sample.

3. Explaining Investment Banking Choice

This section analyzes the determinants of investment banking choice. First, we investigate whether the proxy variables identified in Table 1 differ between the in-house and the investment bank sample. Second, we estimate a probability model of the decision to use an investment bank. Finally, we examine the choice between first-tier and second-tier investment banks.

3.1 Univariate comparisons

We first compare the means (and medians) of our proxy measures and present these results in Table 2. In panel A, we examine the results for the full sample. The main reason for combining such diverse transactions as takeovers and acquisitions of assets of another firm is that the

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[15] We also gather data on the number of investment bankers represented on the boards of the acquiring firms in our sample. There are investment bankers on the boards of five firms in the in-house sample and 11 firms in the investment bank sample, which is twice the size of the in-house sample. Hence, investment banker representation on the board does not affect the choice to use an investment bank for takeover advice.

Table 2
Univariate comparison of in-house transactions to transactions for which the acquiror uses an investment bank (continued next page)

A: Full sample

	In-house sample			Investment bank sample			*t*-test	Rank sum test
	Mean	Median	(*N*)	Mean	Median	(*N*)	*p*-value	*p*-value
Type of acquisition								
Takeovers (%)	44	—	(99)	67	—	(198)	0.00	0.00
Acquisitions of assets (%)	45	—	(99)	26	—	(198)	0.00	0.00
Acquisitions of an equity interest (%)	10	—	(99)	7	—	(198)	0.37	0.37
Transaction and acquiror characteristics								
Hostile acquisition (%)	7	—	(99)	21	—	(198)	0.00	0.00
Acquiror not first bidder (%)	9	—	(99)	17	—	(198)	0.06	0.06
Cash payment (%)	69	—	(99)	58	—	(198)	0.08	0.07
Transaction size ($ million)	471	325	(99)	701	441	(198)	0.01	0.01
Relative size (%)	54	18	(68)	85	31	(125)	0.30	0.04
Number of prior acquisitions	10.1	7.0	(71)	7.7	5.0	(130)	0.08	0.02
Related 3-digit (%)	63	—	(46)	68	—	(74)	0.62	0.62
Number of SICs of target	2.5	1.0	(77)	3.7	4.0	(177)	0.00	0.00
(%) Insider ownership	7.7	2.8	(65)	6.4	1.6	(119)	0.46	0.17
(%) Outsiders on the board	67	70	(66)	67	71	(121)	0.98	0.97
Market reacts positively (%)	52	—	(59)	32	—	(109)	0.01	0.01

B: Takeovers

	In-house sample			Investment bank sample			*t*-test	Rank sum test
	Mean	Median	(*N*)	Mean	Median	(*N*)	*p*-value	*p*-value
Hostile acquisition (%)	7	—	(44)	27	—	(132)	0.00	0.00
Acquiror not first bidder (%)	18	—	(44)	22	—	(132)	0.60	0.60
Payment in cash (%)	64	—	(44)	51	—	(132)	0.14	0.14
Transaction size ($ million)	403	272	(44)	775	434	(132)	0.02	0.00
Relative size (%)	37	18	(30)	90	32	(92)	0.22	0.03
Number of prior acquisitions	13.4	9.0	(33)	8.1	5.0	(93)	0.01	0.01
Related 3-digit (%)	58	—	(24)	66	—	(56)	0.52	0.52
Number of SICs of target	1.9	1.0	(34)	3.5	3.0	(121)	0.00	0.00
Insider ownership (%)	9.3	5.2	(28)	4.9	1.4	(84)	0.06	0.02
Outsiders on the board (%)	65	67	(29)	67	71	(86)	0.62	0.46
Market reacts positively (%)	36	—	(28)	32	—	(85)	0.70	0.70

asymmetric information and contracting costs hypotheses suggest that the transaction type affects the decision to use an investment bank. It is possible, however, that some of the results in panel A are not due to differences between the two samples, but are caused by the differences in sample composition. We examine subsample results in panels B and C.

Since the number of observations depends on the characteristics under study, the size of the sample used for each variable is listed in parentheses. To examine whether in-house transactions differ systematically from transactions where investment bank advice is used, we use a standard *t*-test for means and a rank sum test for medians and report their respective *p*-values in the last two columns of the table.

Table 2
Continued

C: Acquisitions of assets

	In-house sample			Investment bank sample			*t*-test *p*-value	Rank sum test *p*-value
	Mean	Median	(*N*)	Mean	Median	(*N*)		
Payment in cash (%)	71	—	(45)	75	—	(52)	0.67	0.67
Transaction size ($ million)	523	363	(45)	522	455	(52)	0.99	0.50
Relative size (%)	31	13	(31)	54	26	(26)	0.15	0.29
Number of prior acquisitions	7.0	5.0	(32)	6.5	3.5	(26)	0.80	0.41
Related 3-digit (%)	67	—	(18)	64	—	(14)	0.89	0.91
Number of SICs of target	3.0	2.0	(33)	4.3	6.0	(44)	0.01	0.01
Insider ownership (%)	4.6	1.2	(31)	10.3	1.9	(28)	0.08	0.35
Outsiders on the board (%)	69	75	(31)	64	69	(28)	0.30	0.49
Market reacts positively (%)	67	—	(27)	32	—	(19)	0.02	0.02

Characteristics of 99 in-house acquisitions and 198 transactions for which the acquiror uses investment bank advice. The sample size for each variable is in parentheses. Acquisitions of 50% or more of the shares of another firm are classified as "Takeovers," acquisitions of a portion of the assets of a firm are classified as "Acquisitions of assets." Acquisitions of less than 50% of the shares of a firm are classified as "Acquisitions of an equity interest." "Hostile acquisition" is an indicator variable equal to one if the acquisition is hostile, equal to zero otherwise. "Acquiror not first bidder" is an indicator variable equal to one if the acquiror is not the first firm to make a bid, equal to zero otherwise. "Cash payment" is an indicator variable equal to one if the transaction is 100% cash financed, equal to zero otherwise. "Relative size" is the size of the transaction over the market value of the acquiror's equity computed 50 days before the acquisition. "Number of prior acquisitions" is the number of acquisitions made by the acquiror over the 10 years prior to the acquisition as listed in Moody's *Industrial, Transportation, OTC, Bank and Finance, Public Utilities*, and *International Manuals*. "Related 3-digit" is an indicator variable equal to one if the acquiror and the acquired firm or asset have at least one three-digit SIC match in the top four SIC codes provided by the Dun & Bradstreet's *Million Dollar Directory* or at least one three-digit SIC code in common among all SIC codes listed in Standard and Poor's *Register of Corporations, Directors and Executives*, if Dun & Bradstreet data are missing. The indicator variable is equal to zero otherwise. "Number of SICs" is the number of SIC codes in which the target firm is active (as provided by Dun & Bradstreet's *Million Dollar Directory*). "Insider ownership" is the percentage equity ownership in the acquiror by the managers and directors as a group (for the proxy statement filed the year before the acquisition). "Outsiders on the board" is the percentage of independent outside directors on the board of directors of the acquiror (for the proxy statement filed the year before the acquisition). "Market reacts positively" is an indicator variable equal to one if the acquiror announcement abnormal return is larger than zero, and equal to zero otherwise.

Takeovers constitute 44% of the in-house transactions, whereas they constitute 67% of the acquisitions in the investment bank sample. Thus, investment bank assisted acquisitions are more likely to be whole-firm takeovers than acquisitions of assets of other firms. The results in panel A also illustrate that investment bank assisted transactions are more likely to be hostile (21% hostile versus 7% hostile in the in-house sample) and less likely to be all cash financed (58% cash versus 69% cash in the in-house sample). The investment bank sample also has more transactions in which the acquiror is not the first bidder (17% versus 9% in the in-house sample).

The average size of an in-house transaction is $471 million, smaller than the $701 million of the investment bank sample, and the relative size (the transaction size scaled by the acquiror's equity value) of these acquisitions is also larger for the investment bank sample (85% versus 54%). Firms in the in-house sample average 10.1 acquisitions in the

past 10 years, versus 7.7 acquisitions over the same period for the investment bank sample. Targets in the investment bank sample also operate in more industries than targets in the in-house sample (3.7 versus 2.5). There is no difference between the two samples in terms of the relatedness of the acquisitions, insider ownership, or board composition.

In the last row of panel A, we examine whether there is a difference in the direction of the stock price movement when the acquisition is announced. The acquiror's stock price reacts positively in 52% of the in-house acquisitions, compared to only 32% in the investment bank sample. This difference is significant at the 1% level.

The results of panel B, where takeovers are analyzed separately, also support the hypothesis that the use of outside advice is related to the complexity of the transaction. The in-house sample contains a smaller fraction of hostile acquisitions (7% versus 27%), more acquisitions that use cash only as the form of payment (64% versus 51%, but this difference is only significant at the 14% level), and smaller deals ($403 million versus $775 million). The size of the transaction and the fraction of hostile acquisitions are significantly different between the two samples according to both tests. The relative size of the in-house takeovers is 18% (median) versus 32% (median) in the investment bank sample, but this difference is only significant using the rank sum test. Firms in the in-house sample also have more acquisition experience (13.4 versus 8.1 acquisitions in the previous 10 years).

There is no substantial difference between the two samples in industry relatedness, board composition, and announcement abnormal returns. Firms that complete takeovers in-house, however, have larger insider ownership (9.3% compared to 4.9% for the investment bank sample) and they take over firms that operate in fewer industries (1.9 compared to 3.5 for the investment bank sample).

The results regarding acquisitions of assets are reported in panel C of Table 2. Firms whose assets are being acquired without investment banks operate in fewer industries than firms whose assets are acquired with investment bank advice. Insider ownership is higher in the investment bank sample, but at marginal significance levels, and the stock market reaction to the acquisition is positive 67% of the time for in-house acquisitions and only 32% of the time when an investment bank is involved. The other comparisons fail to yield significant results.

Overall, the results in Table 2 support the transaction costs hypothesis, since firms use investment banks for larger, hostile, and noncash transactions when they have little previous acquisition experience. There is some weak support for the asymmetric information and the contracting costs hypotheses.

3.2 The decision to use investment banking services

To examine the marginal contribution of each of our proxies, we employ logistic regression analysis. Table 3 contains estimates of our models for the full sample, whereas Table 4 contains a separate analysis for complete takeovers. We estimate the following regression model:

$$P(\text{acquiror uses investment bank})$$
$$= f(\text{transaction costs, information asymmetry,}$$
$$\text{contracting costs})$$

To include as many observations in the regressions as possible, we retain observations even if they lack information on a particular variable. Instead, we construct dummy variables, which we set equal to one if a particular data item is missing for a particular observation, and zero otherwise. We then include that observation and set the missing data item equal to zero. Our results are similar if firms with missing data items are deleted, but the loss in observations becomes critical when the full model is estimated.

Our tables also provide some insight into the economic significance of our findings. Specifically, we set each variable in the regression model equal to the median of the pooled in-house/investment bank sample. For continuous variables, we then compute what happens to the probability of using an investment bank when each variable is increased from its 25th percentile to its 75th percentile, holding the other variables at their median levels. For indicator variables, we compute how this probability changes when the variable is changed from zero to one.[16] This measure of economic significance is reported in square brackets; *p*-values are reported in parentheses.

To measure previous acquisition activity, we choose a logarithmic form, because we expect the marginal contribution of an additional acquisition to acquisition experience to decrease when the number of previous acquisitions increases. Similarly, to measure the degree of diversification of the target firm we use a logarithmic transformation of the number of industries in which the target operates.

The first three models of Table 3 include the proxies for our three hypotheses separately. Model (1) contains proxies for the transaction costs hypothesis. Four of the five proxies for transaction costs are

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[16] The distribution of in-house and investment bank assisted transactions in our sample is not representative of the distribution of these transactions in the population of top 100 acquisitions. Maddala (1991) argues that this sampling procedure does not affect the coefficients of the explanatory variables in logistic regression models, but it does affect the intercept. We adjust the intercept to take the difference in sampling rates into account when we compute the economic significance of the explanatory variables.

Table 3
Logistic regression analysis of the decision to use investment banking services for an acquisition

Independent variable	Model (1) Transaction costs	Model (2) Information asymmetry	Model (3) Contracting costs	Model (4) Full model
Intercept	−0.36 (0.73)	−1.23 (0.02)	−1.50 (0.19)	−1.38 (0.32)
Hostile acquisition	1.13 (0.01) [6.8]	—	—	0.47 (0.35) [6.2]
Cash payment	−0.69 (0.01) [−4.9]	—	—	−0.53 (0.09) [−6.9]
Acquiror not first bidder	0.19 (0.68) [1.6]	0.32 (0.46) [3.1]	—	0.18 (0.72) [2.6]
Ln (Transaction size)	0.36 (0.02) [3.7]	—	0.43 (0.01) [4.4]	0.25 (0.16) [4.2]
Ln (Previous acquisitions)	−0.50 (0.01) [−7.6]	—	—	−0.59 (0.01) [−14.5]
Related 3-digit		0.48 (0.25) [4.3]	—	0.54 (0.23) [7.0]
Ln (# of SICs of target)		1.33 (0.00) [15.2]	—	1.17 (0.00) [19.5]
Acquisition of assets	—	−1.02 (0.00) [−15.8]	−0.85 (0.00) [−10.9]	−0.95 (0.00) [−18.8]
Insider ownership (%)	—	—	−0.54 (0.70) [−0.3]	−0.49 (0.76) [−0.5]
Outsiders on the board (%)	—		0.22 (0.80) [0.5]	0.67 (0.49) [2.3]
Market reacts positively	—	—	−0.78 (0.03) [−5.3]	−0.70 (0.07) [−8.6]
Pseudo R^2	0.08	0.12	0.07	0.17
Regression p value	0.00	0.00	0.00	0.00

The sample includes 297 takeovers, acquisitions of assets, and acquisitions of partial ownership interest. Acquirors use investment bank advice for 198 acquisitions and do not use investment bank advice for 99 acquisitions in the sample. We estimate the following model:

$$P(\text{acquiror uses an investment bank}) = f(\text{transaction costs, information asymmetry, contracting costs}).$$

The "Hostile acquisition," "Acquiror not first bidder," "Cash payment," "Related 3-digit," "Insider ownership," and "Outsiders on the board" variables are defined in Table 2. "Ln (Transation size)" is the logarithm of the transaction size, as defined in Table 2. "Ln (Previous acquisitions)" is the logarithm of the number of previous acquisitions, as defined in Table 2, plus one. "Ln (# of SICs of target)" is the logarithm of the number of SIC codes of the target, as defined in Table 2. "Acquisition of assets" is equal to one if the transaction is an acquisition of assets, as defined in Table 2, and equal to zero otherwise. For "Ln (Previous acquisitions)," "Related 3-digit," "Ln (# of SICs of target)," "Insider ownership," "Outsiders on the board," and the "Market reacts positively" variables, we include dummy variables that are equal to one if information on these variables is missing, and are equal to zero otherwise. Coefficients on these dummies are not reported. *P*-values are in parentheses. In square brackets, we provide an indication of the economic significance of the independent variables. To compute this significance we: (1) adjust the intercept to reflect the sampling rates of the two subsets [see Maddala (1991)]; (2) set each variable equal to the median of the pooled in-house/investment bank sample; (3) compute the percentage point change in the probability that an investment bank is used when the independent variable is increased from its 25th percentile to its 75th percentile. For indicator variables, we compute this probability change when the indicator variable increases from zero to one.

Table 4
Logistic regression analysis of the decision to use investment banking services for takeovers only

Independent variable	Model (1) Transaction costs	Model (2) Information asymmetry	Model (3) Contracting costs	Model (4) Full model
Intercept	−0.88 (0.59)	−1.78 (0.01)	−3.19 (0.01)	−0.59 (0.79)
Hostile acquisition	1.83 (0.01) [5.2]	—	—	1.83 (0.03) [6.8]
Cash payment	−1.05 (0.01) [−4.0]	—	—	−1.27 (0.01) [−5.8]
Acquiror not first bidder	−0.68 (0.22) [−5.4]	−0.36 (0.48) [−3.8]	—	−0.67 (0.30) [−6.7]
Ln (transaction size)	0.65 (0.01) [4.8]	—	0.72 (0.00) [4.5]	0.25 (0.40) [2.3]
Ln (Previous acquisitions)	−0.73 (0.01) [−7.4]	—	—	−0.83 (0.01) [−11.1]
Related 3-digit		0.65 (0.24) [4.6]	—	0.70 (0.29) [4.0]
Ln (# of SICs of target)		2.03 (0.00) [17.9]	—	1.88 (0.00) [13.9]
Insider ownership (%)	—	—	−2.91 (0.15) [−0.9]	−6.14 (0.05) [−3.2]
Outsiders on the board (%)	—		0.42 (0.74) [0.5]	−0.18 (0.91) [−0.3]
Market reacts positively	—	—	−0.17 (0.72) [−0.9]	0.24 (0.68) [2.0]
Pseudo R^2	0.16	0.16	0.07	0.29
Regression p-value	0.00	0.00	0.00	0.00

The sample for these tests includes 176 takeovers. Acquirors use investment bank advice for 132 takeovers and do not use investment bank advide for 44 takeovers in the sample. We estimate the following model:

$$P(\text{acquiror uses an investment bank}) = f(\text{transaction costs, information asymmetry contracting costs})$$

The explanatory variables are defined in Tables 2 and 3. For "Ln (Previous acquisitions)," "Related 3-digit," "Ln (# of SICs of target)," "Insider ownership," "Outsiders on the board," and the "Market reacts positively" variables, we include dummy variables that are equal to one if information on these variables is missing, and are equal to zero otherwise. *P*-values are in parentheses. In square brackets, we provide an indication of the economic significance of the independent variables. To compute this significance we (1) adjust the intercept to reflect the sampling rates of the two subsets [see Maddala (1991)]; (2) set each variable equal to the median of the pooled in-house/investment bank sample; (3) compute the percentage point change in the probability that an investment bank is used when the independent variable is increased from its 25th percentile to its 75th percentile. For indicator variables, we compute this probability change when the indicator variable increases from zero to one.

significant and all five have the predicted sign. Investment banks are more likely to be involved in large, hostile acquisitions that use at least some securities as a form of payment and that are completed by firms with less acquisition experience. Our findings are also economically

significant. For example, the probability of using an investment bank increases by 7 percentage points when the transaction is hostile.

In model (2), we test the asymmetric information hypothesis. Two variables are significant. As hypothesized, firms are more likely to use investment bank advice when the target firm operates in several industries. Contrary to our prediction, however, "the acquisition of assets" dummy has a negative coefficient. Whereas the asymmetric information hypothesis predicts that firms are more likely to use an investment bank for acquisitions of assets, the negative coefficient indicates that investment banks are more likely to be employed in complete takeovers and acquisitions of a partial ownership interest.

The contracting hypothesis is tested in model (3). Two of the results consistent with this hypothesis have already been discussed: investment bank assisted acquisitions are larger and more likely to be takeovers than acquisitions of assets. Both effects are also economically significant: increasing the size of the transaction from its 25th percentile to its 75th percentile increases the probability of using an investment bank by 4.4 percentage points. And the probability of using an investment bank decreases by 11 percentage points when only some of the assets of a company are acquired. We also find that investment banks are less involved in acquisitions that benefit the acquiror's shareholders. Since this result may be caused by differences in sample composition (i.e., takeovers versus units), we verify in Table 4 whether it also holds for takeovers (and find it does not hold). Finally, board composition and insider ownership have no effect on the investment banking choice.

Model (4) contains the full model. The results are consistent with those reported in models (1)–(3), but the hostile dummy and transaction size are no longer significant.

As we suggested previously, some of the results in Table 3 may be caused by the combination of three diverse samples. To investigate this possibility we estimate separate models for complete takeovers in Table 4. Most of the findings in Table 3 still hold, except that the stock price reaction to the acquisition announcement does not affect investment banking choice. The full model also shows that firms with high insider ownership are less likely to use the services of an investment bank, which is consistent with the contracting costs hypothesis.

We also estimate separate models for acquisitions of units (not reported). Two variables are significant in these regressions. Firms are more likely to use an investment bank when the stock price reaction is negative. If this stock price reaction is anticipated by managers, this finding suggests that firms are more likely to hire an investment bank when they expect to make acquisitions that reduce shareholder wealth. In addition, firms are more likely to use an investment bank

when the company whose assets are being acquired operates in several industries.

Overall, the results of Tables 3 and 4 are consistent with the transaction and contracting costs hypotheses. Investment banks are involved in transactions that are more complex, and which are completed by firms with less acquisition experience. They are also more likely to be involved in takeovers than in acquisitions of assets, which is inconsistent with the asymmetric information hypothesis. For takeovers, firms with lower insider ownership use investment banks more often when making acquisitions. The asymmetric information hypothesis cannot be completely discarded, however, because we find that investment banks are more involved in acquisitions of firms operating in many industries.

3.3 The use of first-tier versus second tier investment banks

In Table 5, we investigate whether there are systematic differences in acquirors' decisions to use first-tier versus second-tier investment banks. If first-tier investment banks are simply better at reducing transaction costs, contracting costs, and asymmetric information problems, we expect our findings to be stronger for this subset. This analysis also indicates for which set of costs investment bank quality, as proxied by our two-tier categorization, is more important.

Five investment banks are classified as first-tier: First Boston, Goldman Sachs, Merrill Lynch, Morgan Stanley, and Salomon Brothers [Bowers and Miller (1990)]. We estimate three models to explore how investment bank quality is related to investment bank choice: in model (1), we estimate the likelihood that a firm will choose a first-tier investment bank versus a second-tier investment bank; in model (2) we compare transactions in which a first-tier investment bank is used to in-house transactions; and in model (3) we compare transactions in which a second-tier bank is used to in-house transactions. Takeovers, acquisitions of units, and acquisitions of a partial ownership interest are combined in this analysis. A separate analysis of takeovers leads to similar inferences.

There is some evidence that transaction costs increase the probability of choosing a first-tier investment bank. Model (1) shows that first-tier banks are more likely than second-tier banks to be involved in large takeovers, completed by firms with little acquisition experience. Model (3) shows that the size or the type of acquisition does not affect the choice between in-house and second-tier banks, but according to model (2) they do affect the choice between in-house and first-tier banks. These effects are also economically significant. For example, an increase in transaction size from its 25th to its 75th percentile leads to an increase in the probability of using a first-tier rather

Table 5
Logistic regression analysis of the use of first-tier, second-tier, or in-house investment banking services

Independent variable	Model (1) *P*(Acquiror uses a first-tier versus a second-tier investment bank)	Model (2) *P*(Acquiror uses first-tier versus in-house invest-ment banking services)	Model (3) *P*(Acquiror uses second-tier versus in-house invest-ment banking services)
Intercept	−0.63 (0.68)	−1.78 (0.27)	−2.02 (0.24)
Hostile acquisition	−1.15 (0.02) [−23.5]	0.13 (0.82) [1.5]	0.86 (0.13) [16.9]
Cash payment	0.15 (0.67) [2.5]	−0.61 (0.11) [−5.8]	−0.57 (0.12) [−10.5]
Acquiror not first bidder	0.36 (0.45) [5.0]	0.53 (0.34) [5.2]	0.04 (0.95) [0.6]
Ln (transaction size)	0.33 (0.09) [5.5]	0.41 (0.07) [5.5]	−0.13 (0.55) [−2.2]
Ln (Previous acquisitions)	−0.59 (0.01) [−12.0]	−1.01 (0.00) [−13.4]	−0.34 (0.18) [5.5]
Related 3-digit	0.89 (0.11) [17.3]	0.91 (0.11) [14.7]	0.09 (0.87) [1.4]
Ln (# of SICs of target)	0.05 (0.89) [0.9]	1.15 (0.00) [13.7]	1.36 (0.00) [31.2]
Acquisition of assets	−1.20 (0.00) [−24.8]	−1.61 (0.00) [−30.7]	−0.49 (0.21) [−6.5]
Insider ownership (%)	−1.25 (0.51) [−1.2]	−2.15 (0.32) [−1.5]	0.56 (0.76) [0.7]
Outsiders on the board (%)	0.21 (0.83) [0.8]	0.38 (0.76) [1.0]	0.39 (0.73) [1.5]
Market reacts positively	0.01 (0.98) [0.2]	−0.47 (0.31) [−4.7]	−1.04 (0.04) [−21.1]
Pseudo R^2	0.11	0.24	0.18
Regression *p*-value	0.01	0.00	0.00
Sample size	198	205	191

Model (1) analyzes the decision to use a first-tier rather than a second-tier investment bank. Model (2) analyzes the decision to use first-tier rather than in-house investment banking services. Model (3) analyzes the decision to use second-tier rather than in-house investment banking services. Acquirors use advice from at least one first-tier investment bank for 106 acquisitions, from only second-tier investment banks for 92 acquisitions, and do not use investment bank advice for 99 acquisitions. First-tier investment banks are First Boston, Goldman Sachs, Merrill Lynch, Morgan Stanley, and Salomon Brothers. The explanatory variables are defined in Tables 2 and 3. Missing observations on the "Ln (Previous acquisitions)," "Related 3-digit," "Ln (# of SICs of target)," "Insider ownership," "Outsiders on the board," and the "Market reacts positively" variables are treated as in Tables 3 and 4. *P*-values are in parentheses. In square brackets, we provide an indication of the economic significance of the independent variables (as defined in Tables 3 and 4).

than a second-tier investment bank of 6 percentage points. Contrary to the transaction costs hypothesis, first-tier investment banks are less likely to be involved in hostile transactions. We suspect that this result is not demand driven but supply driven; that is, at least during part

of our sample period, certain first-tier investment banks refused to become involved in hostile deals.

There is no difference between first- and second-tier investment banks along the other dimensions, such as the form of payment, the number of industries in which the target operates, insider ownership, and board composition. These findings suggest that transaction costs are the only determinant of the first-tier/second-tier choice.

4. Shareholder Wealth Effects

4.1 Wealth gains to acquirors and targets

In this section, we compare in-house acquisitions with acquisitions that use investment bank advice in terms of the acquisition announcement returns. We examine the acquiror's return, the target's return and the division of the gains between the target and the acquiror. There are at least two reasons to expect differences in the returns for acquiring firms. First, if managers want to make value-destroying acquisitions to increase their private benefits, they may seek the fairness opinion of an investment bank as protection against shareholder lawsuits. This suggests lower acquiror returns when an investment bank is used. Second, if investment banks are purely interested in fee income, and if most investment bank contracts do not contain provisions to maximize the acquiror's gain [McLaughlin (1990, 1992)], transactions completed with investment bank advice will result in lower acquiror returns and higher target returns.

Table 6 lists the abnormal returns of targets and acquirors and the total gains for all the transactions in the sample and for subsets of takeovers and acquisitions of assets. Acquiror returns are computed over the 2-day event window starting the day before the announcement of the acquisition in the *WSJ*. We use this narrow event window for acquiror returns to maximize the signal-to-noise ratio. For target firms, the length of the event window depends on the transaction type. For acquisitions of assets and acquisitions of a partial ownership interest, we use the 2-day event window. For takeovers, on the other hand, we compute cumulative abnormal returns starting 10 days before the first announcement and ending at the resolution date or the delisting date, whichever occurs first. We use the wider event window to capture both the preannouncement price run-up and the effect of information that becomes public after the initial announcement is made [Jarrell and Poulsen (1989b)]. We also report total returns, computed as the weighted average of the target and acquiror returns, using their respective equity market values as weights.

Panel A of Table 6 lists the returns for the complete sample. Acquiror returns for in-house transactions are equal to zero, whereas

Table 6
Acquiror, target, and total gains in acquisitions over the 1981–1992 period for in-house acquisitions and for acquisitions for which investment banking advice was used

	Acquiror returns			Target firms returns			Total returns (acquiror + target)		
A: Full sample									
	CARs	*p*-values	*N*	CARs	*p*-values	*N*	CARs	*p*-values	*N*
In-house sample	−0.00	0.57	59	14.99	0.01	60	2.29	0.04	39
Investment bank sample	−1.25	0.00	109	20.58	0.00	120	3.79	0.00	73
Difference	1.25	0.07		−5.59	0.24		−1.50	0.21	
B: Takeovers									
	CARs	*p*-values	*N*	CARs	*p*-values	*N*	CARs	*p*-values	*N*
In-house sample	−1.32	0.01	28	35.48	0.00	25	4.77	0.01	18
Investment bank sample	−1.36	0.00	84	26.91	0.00	88	4.53	0.01	58
Difference	0.04	0.97		−8.57	0.26		0.24	0.89	
C: Acquisitions of assets									
	CARs	*p*-values	*N*	CARs	*p*-values	*N*	CARs	*p*-values	*N*
In-house sample	1.29	0.01	25	0.61	0.25	27	1.27	0.04	16
Investment bank sample	−0.83	0.05	19	2.92	0.01	21	0.05	0.97	11
Difference	2.12	0.04		2.31	0.16		1.22	0.30	

All returns are computed from market model residuals. The market model is estimated using continuously compounded returns over the 200-day period ending 50 days before the initial acquisition announcement. The CRSP value weighted market index is used as a market proxy. Acquiror returns are computed over the $(−1, 0)$ announcement window. For takeovers, we compute target returns starting 10 days before the initial announcement and ending at the resolution of the takeover. For acquisitions of units and interests, target returns are computed for the $(−1, 0)$ announcement window. Total returns are computed as the value weighted average return of targets and acquirors.

firms in the investment bank sample lose 1.25%, on average. The difference between the two samples is significant at the 7% level. Target returns and total returns are both larger for the investment bank sample, but not significantly so. These results may be partly due to differences in the transaction types of the two samples. That is, the in-house sample contains a larger fraction of acquisitions of units, whereas the investment bank sample contains more takeovers. To control for these differences, we analyze takeovers and acquisitions of units separately in panels B and C.

Panel B of Table 6 contains the returns for takeovers. Acquiror returns are basically equivalent for the two samples (−1.32% for the in-house sample versus −1.36% for the investment bank sample), total returns are also equivalent, and target returns are higher in the in-house sample. However, none of the return differences between in-house and investment bank transactions are significant.

The returns for acquisitions of units, displayed in panel C, show a different picture. The acquirors in the in-house sample have positive

and significant abnormal returns of 1.29%; in contrast the acquirors in the investment bank sample have negative and significant returns of −0.83%. The 2.12% difference in returns is significant at the 4% level. Target returns and total returns are not significantly different between the two samples.[17]

To control for other factors that can affect acquiror abnormal returns, we estimate a cross-sectional regression model of the acquiror returns on the characteristics of the firm and the transaction. We include three dummy variables to measure the complexity of the transaction: "hostile acquisition," "acquiror is not first bidder," and "cash payment" [Jarrell and Poulsen (1989a), Asquith, Bruner, and Mullins (1987), Travlos (1987), Bradley, Desai, and Kim (1988)], two variables measuring the governance structure of the bidding firm: the percentage of the shares owned by insiders and the percentage of outside directors on the board [Lewellen, Loderer, and Rosenfeld (1985) and Byrd and Hickman (1992)], the relative size of the acquisition [Jarrell and Poulsen (1989a)], and a dummy for acquisitions of assets [Hite, Owers, and Rogers (1987)]. We also include the acquiror's prior acquisition experience, a dummy if the target and the acquiror operate in the same industry [Morck, Shleifer, and Vishny (1990)], and the number of industries in which the target firm operates. All these variables have also been employed in our models of investment banking choice. In addition, we include a dummy if the investment bank belongs to the first-tier group.

The explanatory variable of interest for our test is an indicator variable, set equal to one if the firm uses an investment bank and zero otherwise. We also include an interaction term between the acquisitions of assets dummy and the investment bank dummy to determine whether asset acquisitions affect acquiror returns differently when an investment bank is used. The results are reported in model (1) of Table 7. The signs of the control variables are consistent with previous research, although some of them lack significance at conventional levels. More importantly, we find that the coefficient on the investment bank dummy is not significantly different from zero; thus, whether or not a firm uses an investment bank has no impact on returns. The interaction between investment banks and assets indicates that the returns to firms that acquire assets of other companies are 2.3% lower when they use the advice of an investment bank, but this effect is significant at the 13% level only. This result suggests that there is no difference in returns between in-house and investment bank assisted

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[17] Hite, Owers, and Rogers (1987) report abnormal returns in corporate assets sales of 1.66% for sellers (targets in our sample) and 0.83% for acquirors. Thus, the negative returns in the investment bank sample are not consistent with their findings.

Table 7
Cross-sectional regression of acquiring firm abnormal returns

Independent variable	Model (1) All acquisitions	Model (2) Takeovers only
Intercept	−0.018 (0.39)	−0.034 (0.24)
Hostile acquisition	−0.025 (0.01)	−0.029 (0.04)
Acquiror is not first bidder	0.014 (0.15)	−0.008 (0.51)
Cash payment	0.011 (0.10)	0.012 (0.17)
Ln (Previous acquisitions)	−0.004 (0.37)	−0.001 (0.91)
Related 3-digit	0.001 (0.30)	−0.002 (0.88)
Ln (# SICs of target)	−0.014 (0.04)	−0.013 (0.20)
Insider ownership (%)	0.058 (0.10)	0.069 (0.17)
Outsiders on the board (%)	0.029 (0.11)	0.045 (0.10)
Relative size	0.005 (0.02)	0.009 (0.00)
Acquisition of assets	0.021 (0.07)	—
Investment bank dummy	0.002 (0.82)	0.004 (0.78)
Interaction investment bank and assets	−0.023 (0.13)	—
First-tier investment bank dummy	0.001 (0.87)	−0.005 (0.66)
Adjusted R^2	0.12	0.11
Regression p-value	0.00	0.02
Sample size	168	112

We estimate the following regression model:

$$Acquiror\ CAR = f(\text{control variables, acquiror uses investment bank advice})$$

The "Hostile acquisition," "Acquiror not first bidder," "Cash payment," "Ln (Previous acquisitions)," "Related 3-digit," "Ln (# SICs of target)," "Insider ownership," "Outsiders on the board," and "Acquisition of assets" variables are defined in Tables 2 and 3. "Relative size" is the transaction size divided by the market value of the equity of the bidder. The "Investment bank dummy" is an indicator variable equal to one if the acquiror uses investment banking advice, and zero otherwise. The "Interaction investment bank and assets" indicator variable is one if the acquiror purchases units or assets of a firm *and* uses investment banking advice, and zero otherwise. The "First-tier investment bank dummy" is one if at least one of the investment banks advising the bidder is First Boston, Goldman Sachs, Merril Lynch, Morgan Stanley, or Salomon Brothers, and zero otherwise. For the "Ln (Previous acquisitions)," "Related 3-digit," "Ln (# SICs of target)," "Insider ownership," and "Outsiders on the board" variables, we include dummy variables that are one if information on these variables is missing, and zero otherwise. The coefficients on these dummy variables are not reported in the table. *P*-values are in parentheses.

transactions, after controlling for the effect of the determinants of investment banking choice. Model (2) of Table 7 presents our results for takeovers only. They are similar to those of model (1); that is, returns are not affected by the decision to use investment bank advice.[18]

We also estimate regression models for target and total abnormal returns (not reported). In none of the models is the in-house dummy or the assets/in-house interaction dummy significant. As expected, we find that target and total returns are smaller for acquisitions of assets than for complete takeovers.

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[18] For takeovers we also examine whether the use of investment bank advice affects the premium paid by acquirors for targets, but we find no significant effect.

4.2 Stock price run-up before the acquisition announcement

The 1980s have been characterized by numerous insider trading cases in which investment bankers used private information about forthcoming acquisitions to earn abnormal profits, possibly at the expense of acquirors. To determine whether in-house transactions are associated with less leakage of private information than investment bank assisted transactions, we examine the target firm stock price run-up over several intervals before the takeover announcement [see Jarrell and Poulsen (1989b)]. We exclude transactions where the acquiror in our sample is not the first bidder, because we want to test for information leakage due to the use of investment banks, and we do not know whether the first (but unsuccessful) bidder used an investment bank.

We do not find a larger stock price run-up in investment bank assisted transactions. For example, the run-up over the 10-day period starting 11 days before the takeover announcement is 7.3% for the in-house sample (20 transactions) and 6.4% for the investment bank sample (76 transactions).

5. Conclusion

In an attempt to better understand the role of investment banks in acquisitions, we examine 99 transactions, completed over the period 1981 to 1992, in which the acquiror does not use investment banking services, and compare them to 198 transactions in which the acquiror uses an investment bank. We find that transaction costs and, in part, contracting costs and information asymmetries are related to the investment banking choice. Firms choose investment banks when the acquisition is more complex, when they have less prior acquisition experience, and when the acquisition involves the takeover of another company. For complete takeovers, we also find that investment banks are used more frequently when the acquiring firm has low insider ownership. In addition, acquirors are more likely to hire an investment bank when the targets operate in several industries.

The returns earned by the acquirors in our sample do not depend on whether an investment bank is used, after controlling for the determinants of investment banking choice. There is also no difference in the preannouncement run-up in the stock price of target firms between in-house and investment bank assisted transactions.

As with all empirical work, some caveats are in order. First, it is not certain that the factors affecting investment banking choice are exogenous. For example, it is possible that investment banks influence the form of payment or the decision to pursue the acquisition. Second, in some tests we only use a subset of our sample because data on

some of our proxies are not available. Therefore, we cannot be certain whether the effects uncovered for parts of the sample also hold for the sample as a whole. Third, as mentioned previously, we only investigate the largest acquisitions per year, and our results may not apply to smaller transactions. Nevertheless, at the very least, a contribution of this article is that it highlights relations between several factors and investment bank choice and that we propose a framework for analyzing this decision. Additional work on the specific functions performed by investment banks during the acquisition process, and on the impact they have on the acquiror's decision process, is required to further advance our understanding of the role they play.

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