

How Much Is That
Company Worth?:
Interorganizational
Relationships,
Uncertainty, and
Acquisition Premiums

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This study investigates the effects of interorganizational relationships on the decision of how much to pay when acquiring another company (acquisition premiums). I argue that firm managers will look to both their interlock partners and professional firms when deciding how much to pay. Drawing on diverse literatures on the effects of uncertainty on interorganizational relationships, I further argue that the impact of interlocks and professional firms on the premium decision will be stronger when managers are uncertain about the value of the acquisition target. Hypotheses are developed and tested on 453 acquisitions that occurred during 1986–1993. Results show that both interlocks and relationships with professional firms affect acquisition premiums. Premiums paid by an acquirer are related to those paid by their interlock partners and to those paid by other firms using the same professional firm. Only the interlock premium relationship, however, is stronger under conditions of uncertainty. The study contributes to our understanding of the role of interorganizational transfers of routines, practices, and structures in interorganizational decisions. •

The interorganizational transfer of routines, practices, and structures plays a central role in several theories of organizational action, but we have little knowledge of the mechanisms or conditions surrounding such transfers. Theories of organizational learning, for example, specify that organizations learn by observing and importing the practices of other organizations (Levitt and March, 1988; Lant and Mezias, 1990; Huber, 1991). Strategic choice theories discuss second-mover advantages, which result when competitors copy each other in a way that confers strategic advantage (e.g., Porter, 1980; Dutton and Freedman, 1985; Lieberman and Montgomery, 1988). Theories of imitation and institutional isomorphism specify that organizations adopt the legitimated practices, routines, and structures of other organizations (e.g., March, 1981; DiMaggio and Powell, 1983). Finally, the network and diffusion of innovation literatures focus on how organizational characteristics and network position affect the diffusion of practices among organizations (e.g., Rogers, 1983; Burt, 1987).

Researchers have recently begun to focus on the mechanisms through which transfers occur and to trace empirically the transfer of a specific practice or structure from one independent firm to another (Galaskiewicz and Wasserman, 1989; Davis, 1991; Mizruchi, 1992; Haunschild, 1993; Palmer, Jennings, and Zhou, 1993). This research all demonstrates the following: (1) that firm A does "X"; (2) firm B is exposed to firm A through some interorganizational linkage; and (3) later, firm B does "X." The "X"s studied are firm practices, structures, and major strategic decisions. The primary linkage studied is the director interlock. Davis (1991) showed that the likelihood of a firm adopting a poison pill (a firm-level defense against unwanted takeover) is increased when that firm is interlocked with other firms that previously adopted one. Haunschild (1993) showed that the number and types of acquisitions that firms do are affected by

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acquisitions their interlock partners did. Palmer, Jennings, and Zhou (1993) showed that firms were more likely to adopt the multidivisional form when interlocked with others that previously adopted it.

Overall, this research shows that interlocks act as a mechanism for the transfer of major practices and structures among organizations. Yet this focus on interlocks ignores the fact that firms have many other types of interorganizational relationships. Research on noninterlock relationships is just beginning to occur. Galaskiewicz and Wasserman's (1989) study, for example, showed that intercorporate acquaintanceship networks affected decisions involving who would receive corporate philanthropy. Other types of noninterlock relationships are also likely to act as a source of influence on firm practices (see Mizruchi, 1992; Palmer, Jennings, and Zhou, 1993). For example, many firms have relationships with professional organizations such as attorneys, accountants, and investment bankers. These relationships can be quite stable and long-lasting (Levinthal and Fichman, 1988) and are likely to have the same kinds of effects as directorships.

A second issue with the research to date is that much of the theory behind interorganizational transfers implies that uncertainty or ambiguity is the driving force behind such transfers. There is a long history of research on the effects of uncertainty on organizations. Most of this research focuses on the problems that uncertainty causes organizational decision makers and on the structural solutions to such problems (e.g., Dill, 1958; Lawrence and Lorsch, 1969; Duncan, 1972). Uncertainty has been shown to lead firms to take various actions designed to stabilize interorganizational transactions (Williamson, 1975, 1981; Pfeffer, 1972; Pfeffer and Salancik, 1978; Leblebici and Salancik, 1982) and buffer them from the problems of uncertainty. Yet uncertainty may have another effect. It may cause managers to look outside their own organizations and incorporate the routines, practices, and structures of other organizations in their field. Various social psychological and organizational theories support this idea. Neoinstitutional theorists say that uncertainty drives mimetic isomorphism, in which organizations adopt the legitimated practices of others (DiMaggio and Powell, 1983). Festinger's (1954) social comparison theory states that uncertainty causes individuals to compare their behavior with that of relevant others and adjust accordingly. Decision-making theories propose that uncertainty causes firms to economize on search costs (Cyert and March, 1963). Imitating others is an efficient way to economize.

Taken together, these theories suggest that social information plays a bigger role under conditions of uncertainty. Uncertainty prompts an active search for models and information from others. I propose that interorganizational partners are a likely source of such models and information. Accordingly, the transfer of practices and structures through various interorganizational relationships should be more likely under conditions of uncertainty. To date, studies of interorganizational transfers have not included measures of uncertainty. By not

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measuring uncertainty, we are left with several unanswered questions about its effects. We don't know whether uncertainty is necessary for interorganizational transfers. If uncertainty is necessary, does the level matter? Are transfers more likely to occur with high uncertainty than low uncertainty? We also don't know whether uncertainty differentially affects the likelihood of transfers through various relationships. It is possible, for example, that uncertainty makes transfers from professional firms more likely than transfers from partners in cooperative relationships. Exploring these types of questions will lead to a better understanding of the conditions under which interorganizational relationships influence the adoption of practices and structures.

The purpose of this study is to investigate the effects of interorganizational linkages on an important firm decision: deciding how much to pay when acquiring another firm. Since we know little about the effects of linkages other than director interlocks, both interlocks and relationships with professional firms are studied. A second purpose is to investigate whether the effects of these linkages vary with uncertainty. I argue that firm managers will look to their interlock partners and professional firms when determining acquisition premiums, and the transfer of practices among these sets of firms is affected by the level of uncertainty about how much should be paid for a particular target.

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Acquisition premiums are an interesting and important area in which to explore the impact of interorganizational linkages because there is so much variation in premiums, and large premiums can be disastrous. A premium is the percentage difference between the trading price of the target's stock before the announcement of the acquisition and the price per share paid by the acquiring firm. Firms pay a 50-percent premium on average, but premiums vary widely, and those over 100 percent are not uncommon (Varaiya and Ferris, 1987). It appears that overpayment for targets is frequent, occurring in 67 percent of the acquisitions completed in the mid-1980s (Varaiya and Ferris, 1987). Some researchers have suggested that overpayment may be the reason for the generally disappointing postmerger performance seen in acquiring firms (Lubatkin, 1983; Varaiya and Ferris, 1987). Sometimes firms pay so much, they may cause their own bankruptcy: one year after Campeau paid a 124-percent premium to acquire Federated Department Stores, Campeau declared bankruptcy, citing its inability to meet the debt payments on the acquisition (Kaplan, 1989; Trachtenberg, Meinbardis, and Hiller, 1990). Thirteen months after Merv Griffin (of Griffin Group) paid a 148-percent premium for Resorts International, Resorts was in bankruptcy (Mahar, 1990).

These examples suggest the importance of studying acquisition-premium decisions, yet little work has been done in this area. To date, the literature has focused on two explanations for premiums: synergies and competition for the target. Synergies result when the assets of the acquirer and target can be put together in a way that makes both

better off than they were before the acquisition. Theoretically, the greater the synergies, the higher the premium the buyer is willing to pay, yet the evidence for synergies is surprisingly weak (Varaiya, 1988; Slusky and Caves, 1991). The evidence for competition is stronger. Several studies have shown the presence of competition to be related to higher premiums paid for targets (Varaiya and Ferris, 1987; Varaiya, 1988; Slusky and Caves, 1991). This evidence is consistent with the "winner's curse" phenomenon (Capen, Clapp, and Campbell, 1971; Bazerman and Samuelson, 1983), in which the winner of an auction is the party that most overestimated the true value of the object being auctioned.

It is not too surprising that premiums vary widely when one considers that deciding how much to pay for another company can be a difficult decision, subject to varying levels of uncertainty. There are likely to be situations in which it is unclear what premium level would convince target management and shareholders to turn over the control of their company to the acquirer, discourage competitive bids, and yet still reflect the value of the company that is being bought. Competitive bids require decisions about whether to raise the bid or withdraw, and the consequences of continuing or withdrawing are usually unclear. Managers are routinely advised not to pay too much and to avoid the winner's curse (e.g., Allen, 1990; Reichheld and Henske, 1991). But how does one go about not paying too much? The financial evaluation of acquisitions has been the subject of much work in finance and accounting (e.g., Bing, 1980; Copeland, Koller, and Murrin, 1990). The conditions surrounding evaluation decisions, however, can be uncertain and open to judgment (Trautwein, 1990). If the financial condition of the target is highly variable, for example, then managers have to attempt to find the causes of the variance and then decide how to adjust the premium to allow for this.

One way that managers can gain information and reduce the uncertainty surrounding the premium decision is to turn to their interorganizational partners. There is some anecdotal evidence that interorganizational relationships affect premiums. In the Federated-Campeau transaction, for example, the price paid for Federated was one that Campeau's investment banking firms "had endorsed as reasonable for [them] to pay" (Trachtenberg, Meinbardis, and Hiller, 1990: 1). Griffin relied on his accountant's recommendations about the Resorts International purchase. Apparently neither Griffin nor his accountant had much of an idea of how much Resorts' assets were worth (Mahar, 1990). When asked why he recommended the deal to Griffin, the accountant said "I think that there are enough different opportunities that, by the time the dust settles, (the deal) will be profitable" (Mahar, 1990: 43).

Interorganizational Effects and Valuation Uncertainty

Of the many types of interorganizational relationships that firms have, two seem likely candidates for managers to turn to when deciding how much to pay for another company: (1) They will look to their interlock partners, and (2) they will look to acquisition professionals.

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Director interlocks. Director interlocks are a source of information about business practices (Useem, 1984) and have been shown to influence the adoption of various practices (O'Reilly, Main, and Crystal, 1988; Davis, 1991; Mizruchi, 1992; Haunschild, 1993; Palmer, Jennings, and Zhou, 1993). In support of this, Useem (1984) described several instances in which managers sitting on the board of another firm decide that what that firm is doing might be relevant to their own firm. Interlocks are also likely to influence premium decisions. Acquisitions are usually important enough to be discussed at board meetings, and discussions are likely to involve the premium and how it was determined. Since the premium is the percentage spread between the purchase price and the trading price of the target's stock, premiums provide a standardized measure of payment that allows very different transactions to be discussed with a common language. Exposure to the premium-determination process also provides directors with information and examples that are concrete and proximate. Such vivid, case-type data are generally more influential than pallid, abstract statistics (Nisbett and Ross, 1980). Sitting on a board and being exposed to a firm's premium determination process, therefore, may provide managers with information relevant to their own premium decisions. If director interlocks influence premium decisions, then there should be similarity in the premiums paid by firms tied to each other through director ties, and this similarity has to occur in a time-ordered fashion. Thus there should be a positive relationship between premiums paid by acquiring firms and the prior premiums paid by their interlock partners:

Hypothesis 1a (H1a): Premiums paid by acquiring firms are positively related to prior premiums paid by their interlock partners.

While there may be a general influence of director interlocks, their influence should be stronger under conditions of uncertainty. Individuals in uncertain, ambiguous situations are inclined to look to others for clues or suggestions about appropriate behavior (Sherif, 1936; Asch, 1951; Festinger, 1954), and neoinstitutional and decision-making theories suggest that interorganizational relationships are likely to be more influential under conditions of uncertainty (e.g., Cyert and March, 1963; DiMaggio and Powell, 1983). Although many forms of uncertainty exist, the uncertainty surrounding the value of an acquisition target (hereafter called "valuation uncertainty") is likely to affect acquisition premiums greatly. When there is general disagreement about the value of a target, the managers of the acquiring firm should be more likely to turn to others for information and to respond to any information gained. This means that under conditions of uncertainty, firms make an active search for models of what to do. One likely source of such models is what was done by the firm's interlock partners, which means that what the interlock partners paid for their acquisition is likely to be more influential under conditions of uncertainty:

Hypothesis 1b (H1b): The relationship between premiums paid by acquiring firms and prior premiums paid by their interlock partners is strengthened by target valuation uncertainty.

Acquisition professionals. A second possibility is that managers will turn to those with knowledge and expertise

for information and assistance in deciding the premium to be paid for a target. Investment banking firms can provide such knowledge and expertise. Investment banking firms are well known as advisors to companies involved in acquisition transactions (see Eccles and Crane, 1988; Baker, 1990). While firms generally have long-term relationships with a small number of investment banking firms (Baker, 1990), the number used on a given acquisition will vary. Some firms may not use any firms on a transaction, preferring to perform the functions of an investment banker themselves. According to the earlier arguments about uncertainty causing managers to look outside their own firm, the use of investment banking firms on a transaction is likely to vary with transaction uncertainty, because uncertainty drives the search for information and advice. It may also occur because uncertainty drives the search for legitimacy, and using investment banking firms on a transaction provides legitimacy. Pfeffer (1981) suggested that outside experts are sometimes used to legitimate and rationalize organizational decisions. Using an investment banking firm on an acquisition may serve to legitimate the acquisition and/or the premium for the organization:

Hypothesis 2 (H2): As target valuation uncertainty increases, so does the number of investment banking firms used by the acquiror on a given acquisition transaction.

If firms are using investment banking firms to advise on acquisition transactions, then one possible outcome of their use is that these investment bankers are spreading ideas and information about premiums among firms. According to DiMaggio and Powell (1983), consultants act like "Johnny Appleseeds," spreading models throughout the business community. Investment banking firms appear to perform this model-spreading function with corporate acquisitions. Investment bankers tend to promote models that are currently in fashion, rather than those based on an understanding of a particular firm and its needs (Eccles and Crane, 1988). If this applies to acquisition premiums, then there should be some similarity among the premiums paid by the clients of various investment bankers. Thus the premium paid by an acquiror that uses an investment banking firm should be related to the premiums paid on recent transactions by other acquirors using the same investment banking firm. As with directors, if investment banking firms are mechanisms through which the interorganizational transfers of routines and practices occur, there will be similarity among various investment bankers in the premiums paid by their clients:

Hypothesis 3a (H3a): Premiums paid by acquirors using an investment banking firm are positively related to prior premiums paid by other acquirors using the same investment banking firm.

While the above effects of investment banking firms may operate in general, according to the theory outlined earlier, they should be particularly likely to occur for transactions with high levels of valuation uncertainty. High uncertainty allows social information to play a bigger role in the premium determination process, thus making it more likely that investment bankers will spread models among firms. If true, the relationship between prior premiums paid by firms that

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used the same investment banker and premiums paid by the acquiring firm will be stronger under conditions of uncertainty:

Hypothesis 3b (H3b): The relationship between premiums paid by acquirors using an investment banking firm and prior premiums paid by other acquirors using the same investment banking firm is strengthened by target valuation uncertainty.

An alternative explanation for the relationship between premiums paid by other firms that used the same investment banker and premiums paid by the acquiror is that this relationship is due to some third variable causing similar premiums for both firms. The effects of investment bankers can be isolated from more general effects that would result in similar premiums by testing whether the premium paid by an acquiror is related to premiums paid by other acquirors using a different investment banker, as stated in the following hypothesis:

Hypothesis 3c (H3c): Premiums paid by acquirors using an investment banking firm are positively related to prior premiums paid by acquirors using different investment banking firms.

If no evidence is found for H3c, then this supports the idea that the relationship between premiums paid by acquiring firms and premiums paid by other firms on transactions involving the same investment banker is due to that investment banker spreading models and information among firms, and not to some unspecified variable causing premium similarity among all firms.

METHOD

Sample

The sample consisted of all acquisitions completed between January 1, 1986 and July 15, 1993 in which the acquiring firm bought a controlling interest in the target firm, and both acquiror and target were U.S.-based, publicly held companies. This produced an effective sample of 788 acquisitions before exclusions for missing data. Including only U.S.-based, publicly held companies was necessary to ensure that data were available on premiums, interlocks, and several control variables. For example, interlock data are only available from the proxy statements filed by publicly held acquirors, and premiums are calculated based on the trading price of a target's stock, which is only available for publicly traded targets. The sample is restricted to completed acquisitions because premium data were not available for transactions in which the acquiror was not ultimately successful in its bid for the target. The causes of premiums for unsuccessful bids are beyond the scope of this study.

Measures

Dependent variables. Premium data were obtained from the Merger and Corporate Transaction Database maintained by Securities Data Corporation (SDC). The premium paid for the target company was calculated as the percentage difference between final price per target share paid by the acquiring firm and the target's stock price four weeks before the offer announcement. Premiums are generally calculated two to eight weeks before the announcement date to avoid the distortion caused by typical increases in the target's

stock price due to information leaks (Nathan and O'Keefe, 1989). The average premium paid by the sampled firms was 52.6 percent with a standard deviation of 41.1.

The investment banking firms used by the acquirors and targets for each transaction were also obtained from the SDC database. I created a variable to reflect the number of investment banking firms used by the acquiror on each transaction. A total of 235 investment banking firms advised on the various transactions included in the sample.

Independent variables. Uncertainty was operationalized as the variance of opinion about the value of the target. While this cannot be directly observed, a proxy measure was obtained from the I/B/E/S database of Lynch, Jones and Ryan, who monitor the earnings per share (EPS) estimates of over two thousand companies. These estimates are produced by approximately 2,400 research analysts employed by 141 institutional brokerage and research firms. The variance of estimates reflects the dispersion of opinion among analysts about the future performance of a company. If analysts' estimates vary, then there is a lack of agreement or clarity about the underlying facts affecting the target's value, which in turn is likely to make the buyer uncertain about how much to pay. The uncertainty measure was the coefficient of variation, i.e., the ratio of the standard deviation to the mean, of the analyst's projected target EPS estimates for the year the acquisition occurred. Estimates as of December of the year before the acquisition were used. The measure's strengths lie in the fact that it is (1) specific to the transaction (Leblebici and Salancik, 1982); (2) involves multiple respondents (analysts); (3) allows uncertainty to be measured at the proper time prior to the transaction; and (4) is likely to be based on the same information that firm managers are using in their premium decisions.

I/B/E/S data were available for 453 of the 788 targets, reducing the effective sample size to 453. I conducted analyses designed to find out whether transactions with I/B/E/S data were different from those without. Results of these analyses show that transactions with I/B/E/S data involve larger targets, and the acquirors tend to use more investment bankers. There were no other differences, including no differences in premiums, the number of competing bids, and the year the acquisition occurred.

Data on the interlocks of acquiring firms were obtained from proxy statements. I used the SDC database to obtain data on acquisitions completed by those firms on whose boards the inside and outside directors of the acquiring firm sat. Both inside and outside directors were used because both have been shown in various interlock studies to be influential (e.g., Davis, 1991; Palmer, Jennings, and Zhou, 1993). I then created a variable representing the average premium paid by those tied-to firms during the three years before the date of the acquiring firm's transaction. Three years seemed a reasonable period for the sampled firms to be influenced by the premium decisions of their interlocked firms. Any premium determination by the interlocked firms that is over three years old is likely to be out of date and thus will not significantly influence the acquiring firm. The three-year

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period is supported by Haunschild (1993), who found that firms imitate the acquisitions of their interlock partners for three years.

For the investment banking firm used by an acquiror, I created a variable reflecting the average premium paid on all transactions involving that investment banking firm during the prior three years. If multiple investment bankers were used, these premiums were averaged. I also created a variable reflecting the average premium paid during the prior three years on all transactions involving investment banking firms not used by the acquiror.

Control variables. A review of the literature on acquisition premiums suggests other variables that influence or have been proposed to influence the premium paid for a target and that should therefore be controlled. These variables include the number of competitive bids, synergy between the acquiror and target, target profitability, the industry of the target firm, and the year the acquisition occurred.

Studies have shown that competitive bids affect acquisition premiums (Varaiya and Ferris, 1987; Varaiya, 1988; Slusky and Caves, 1991). Following these other studies, I controlled for the presence of other bidders by whether another entity submitted a rival bid for the target. For this study, data regarding the number of these other bids were available from the SDC database, and I created a variable measuring the number of competitive bidders for each acquisition.

Slusky and Caves (1991) proposed that the acquiror will pay a higher premium in acquisitions when there is a particularly good fit between the acquiror and target, i.e., when the acquisition is synergistic. To control for synergies between the acquiror and target, two measures of fit were used. One measure is the relationship between the business activities of the acquiring and target firms. Following Rumelt (1974), I considered such activities to have synergistic potential when the two firms serve common customers, use common distribution channels, or use related production technologies. These potentials are captured with related acquisitions, in which firms are acquiring others in similar industries. Vertical acquisitions, in which firms acquire suppliers or distributors, are also synergistic (Slusky and Caves, 1991). Here synergy comes from control over the inputs or outputs of the firm's production process. Thus related and vertical (as opposed to conglomerate) acquisitions are synergistic.

A classification scheme similar to those used in other studies of acquisitions (e.g., Ravenscraft and Scherer, 1987; Blair, Lane, and Scharf, 1991; Davis, Diekmann, and Tinsley, 1994) was used to classify acquisitions into related, vertical, and conglomerate. An acquisition was coded as related when the two-digit Standard Industry Classification (SIC) code of the acquiring firm matched that of the acquired firm. SIC codes were obtained from the SDC database. An acquisition was coded as vertical when the industry of the acquiring firm either sold more than 5 percent of its output to or received more than 5 percent of its input from the industry of the acquired firm. The input-output numbers were obtained from the U.S. Department of Commerce's *Survey of Current Business*. All remaining acquisitions were

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coded as conglomerate. The synergy variable was coded 1 if the transaction involved a related or vertical acquisition, 0 otherwise.

The second synergy measure captures the potential gain in productivity of the target's assets from an acquisition. This gain should increase when the acquiring firm is much larger than the target (Slusky and Caves, 1991) and will only occur when the two firms also have business synergy. Following Slusky and Caves (1991), I measured the relationship between the size of the acquiring firm and the size of the target firm by dividing the total sales of the acquiring firm by the total sales of the target, measured at the end of the year before the acquisition. I then created the interaction of the size relationship and business synergy variables. Size data were obtained from COMPUSTAT.

The target's profitability might also affect acquisition premiums, though the direction of this effect is difficult to specify. On the one hand, profitable targets can probably command higher premiums. On the other hand, the acquiror's management can replace the presumably inefficient management of unprofitable targets and generate quick financial benefits. This latter idea is consistent with financial theories saying that acquisitions are driven by the replacement of inefficient management (cf. Jensen and Ruback, 1983). To control for the target's profitability, I created a variable reflecting the target's return on equity, measured at the end of the year before the acquisition. I then subtracted from that variable the average return on equity for all other firms in the target's industry and used the result as the profitability control variable. Profitability data were obtained from COMPUSTAT.

Both the target industry and the year the acquisition occurred might affect the acquisition premium. While industry may be a source of environmental or competitive uncertainty (e.g., Pfeffer, 1972; Pfeffer and Salancik, 1978), targets in some industries can probably command higher premiums because these industries are attractive to all acquirors. While it may be interesting to see whether environmental uncertainty affects interorganizational transfers, disentangling uncertainty from other industry characteristics is difficult. Industry was therefore used as a control variable by coding each transaction with dummy variables for the target's 2-digit SIC code. Forty-seven industry dummy variables were used in the analyses. Finally, because the year the acquisition occurred might affect the acquisition premium if any macroeconomic factors occur that affect the benefits of an acquisition (e.g., tax code changes), years (1986–1993) were entered as a set of dummy variables.

Control variables used in the test of H2 (whether uncertainty affects the number of investment banking firms used by the acquiror) include the number of competitive bids, transaction size, and the number of advisors used by the target firm. The number of competitive bidders may add uncertainty or complexity to a transaction that is independent of uncertainty in the value of the target and may result in an acquiring firm using one or more investment bankers.

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Transaction size was used as a control variable because large transactions are more complex, requiring the use of one or more investment bankers. Transaction size was calculated by multiplying the price paid per target share by the number of shares purchased. The number of investment bankers used by the target is a general control for all factors independent of transaction uncertainty that influence whether or not investment bankers are used by both acquirors and targets on a transaction.

Analyses

All hypotheses except H2 have the premium paid on the acquisition transaction as the dependent variable, and OLS regression was used to test these hypotheses. To test the moderating role of uncertainty, separate models were run for focal variables alone and focal variables plus their interactions with uncertainty.

Given that the dependent variable used to test H2, the number of investment banking relationships used by the acquiring firm, is a count ranging from zero to four, Poisson regression is appropriate. Poisson regression has been used in other acquisition studies in which the dependent variable is a count (e.g., Davis, Diekmann, and Tinsley, 1994).¹ If the investment banker relationship count is denoted as Y_i , and each Y_i is assumed to follow a Poisson distribution with $E(Y_i) = \lambda_i$, the regression model predicts the log of the intensity rate, λ_i , as a function of the observed covariates.

RESULTS

Table 1 presents descriptive statistics for the three samples used in the data analysis. Descriptive statistics for the 453 acquisitions with uncertainty (I/B/E/S) data are outlined in columns 1 and 2. This sample was used to test whether uncertainty affects the number of investment banking firms used by the acquiror (H2). Two hundred and forty of the 453 transactions with uncertainty data involved firms interlocked with others that completed acquisitions, and the descriptive statistics for this subsample are outlined in columns 3 and 4. This sample was used to test whether premiums paid by acquiring firms are related to premiums paid by their interlock partners (H1a and H1b). Three hundred thirty-one of the 453 transactions with uncertainty data involved firms that used investment bankers, and the descriptive statistics for this subsample are outlined in columns 5 and 6. This sample was used to test whether premiums paid by acquiring firms are related to premiums paid by other firms using the same investment banker and by firms using different investment bankers (H3a, H3b, and H3c). Analyses were conducted to see whether premiums for the 240 transactions used in the interlock analyses or the 331 transactions used in the investment banker analyses were different from premiums for the larger sample of 453 transactions. Results show no differences in premiums paid by firms in these subsamples and premiums paid by the larger sample. Table 2 presents correlations among key study variables.

Models 1–3 in Table 3 present the results of the regression analyses used to test whether acquiring firms and their

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Some researchers have recently begun to call for the use of negative binomial regression in place of Poisson (e.g., Ramaswamy, Anderson, and DeSarbo, 1994). Negative binomial regression does not require the assumption, as does Poisson, that the variance of the dependent variable is equal to its mean (an assumption that is often violated). To see whether this assumption causes problems for this study, H2 was also analyzed using negative binomial regression. The significance of the coefficients does not change with the form of analysis, so Poisson results are reported.

Table 1

Descriptive Statistics for Key Study Variables

Variables	Full sample (N = 453)		Interlock subsample (N = 240)		Investment banker subsample (N = 331)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Dependent						
Acquisition premium (%)	52.66	41.11	51.66	36.74	51.79	40.87
N Acquiror IBankers	.976	.680	1.00	.643	1.28	.527
Independent						
Interlock partner premium	50.04 (N = 248)	34.52	50.00 (N = 248)	34.52	47.29 (N = 190)	30.19
Own IBanker premium	50.80 (N = 362)	14.50	50.29 (N = 203)	14.28	49.99 (N = 331)	11.77
Other IBanker premium	50.91 (N = 338)	13.59	50.93 (N = 190)	13.21	50.91 (N = 331)	13.43
Controls						
Target uncertainty	33.47	106.66	31.48	119.45	48.19	94.75
Transaction size (millions)	694.41	1481.81	664.87	1261.75	848.98	1676.94
N competing bids	.209	.521	.223	.565	.222	.540
N target IBankers	.695	.460	.696	.461	.701	.458
Size relationship	20.04	78.23	17.60	81.08	18.67	78.13
Size synergy	11.45	50.09	7.39	21.20	9.33	36.19
Adj. target ROE	0	5.63	-.07	4.97	.38	5.96
Year						
1986	.154	.362	.222	.416	.159	.367
1987	.181	.385	.215	.411	.189	.392
1988	.179	.384	.194	.396	.204	.404
1989	.139	.346	.101	.302	.142	.350
1990	.108	.311	.081	.273	.107	.309
1991	.115	.319	.064	.246	.089	.248
1992	.108	.311	.101	.302	.092	.289
1993	.015	.123	.020	.141	.017	.132

interlock partners pay similar premiums and whether this relationship is affected by uncertainty (H1a and H1b). This analysis was done on those 240 transactions by acquiring firms whose interlock partners completed one or more acquisitions during the three years prior to the acquiror's transaction. As predicted, there is a positive relationship

Table 2

Correlations among Key Study Variables*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Acquisition premium (N = 453)											
2. # Acquiror IBankers (N = 453)	-.036										
3. Interlock partner premium (N = 240)	.416	-.120									
4. Own IBanker premium (N = 331)	.158	-.048	-.042								
5. Other IBanker premium (N = 331)	-.046	.021	-.146	.905							
Controls (N = 453)											
6. Target uncertainty	-.030	.099	-.029	.014	.032						
7. # Competing bids	.126	.057	.121	.043	.037	-.009					
8. Size relationship	-.014	-.085	.018	-.069	-.090	-.002	-.033				
9. Size synergy	-.015	-.089	-.004	-.085	-.096	-.014	-.027	.894			
10. Business synergy	.040	-.011	.005	-.004	-.012	-.037	.030	-.008	.098		
11. Deal value	.033	.321	.001	.177	.214	.047	.016	-.054	-.041	-.020	
12. # Target IBankers	.026	.287	.635	.218	.255	.134	.081	-.043	-.033	-.002	.370

* For a sample size of 453, correlations greater than approximately .07 are significant at the .05 level.

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between premiums paid by the interlock partners in the prior three years and premiums paid by the acquiring firm in the current year. Adjusted R^2 increases from .178 for the base model to .356 for the base model plus the interlock-partner-premium variable.

It also appears that uncertainty positively affects this relationship. As shown in model 3, the interaction of interlock partner premiums and target uncertainty is positive and significant, which means that the relationship between acquirors' premiums and premiums paid by their interlock partners gets stronger as the level of transaction uncertainty increases.

Table 3

Regression Analyses of Determinants of Acquisition Premiums*							
Variable	(1)	(2)	(3)	Model (4)	(5)	(6)	(7)
Interlock partner premium		.458** (.064)	.378** (.068)				.463** (.102)
Interlock premium × target uncertainty			.004** (.001)				.004** (.002)
Own IBanker premium					.909** (.273)	.983** (.280)	.777** (.280)
Other IBanker premium					4.046 (5.289)	4.063 (5.285)	6.951 (5.339)
Own IBanker premium × target uncertainty						-.003 (.002)	-.001 (.003)
Controls							
Target uncertainty	-.015 (.021)	-.006 (.018)	-.149** (.052)	-.002 (.021)	.003 (.021)	.144 (.120)	-.179 (.193)
# Competing bids	20.737** (4.549)	16.042** (4.081)	17.300** (4.020)	20.594** (4.455)	19.169** (4.367)	18.782** (4.376)	18.709** (4.642)
Year							
1987	-1.147 (7.391)	.174 (6.545)	.575 (6.414)	.507 (7.736)	-1.767 (7.557)	-1.555 (7.553)	-2.872 (6.704)
1988	24.988** (7.729)	15.373* (6.972)	14.666* (6.835)	24.972** (7.854)	22.922** (7.690)	23.134** (7.686)	5.710 (7.010)
1989	1.032 (9.029)	-.636 (7.996)	-2.413 (7.858)	12.569 (8.301)	15.280 (8.155)	14.814 (8.148)	-2.473 (8.290)
1990	-4.217 (10.041)	-2.656 (8.892)	-2.606 (8.712)	17.382 (9.065)	14.500 (8.927)	14.069 (8.927)	-.820 (9.960)
1991	7.711 (10.742)	2.719 (9.534)	1.557 (9.349)	13.225 (9.261)	14.905 (9.053)	13.574 (9.114)	19.929 (11.602)
1992	-2.309 (9.041)	-1.026 (8.005)	-1.652 (7.846)	1.474 (8.971)	2.581 (8.764)	2.708 (8.768)	-7.795 (8.752)
1993	16.776 (17.628)	16.016 (15.611)	16.915 (15.292)	5.009 (17.609)	18.690 (17.536)	19.431 (17.533)	20.566 (14.771)
Business synergy	-6.241 (6.066)	4.801 (5.373)	4.003 (5.271)	1.248 (5.653)	1.303 (5.519)	1.895 (5.537)	-4.153 (5.450)
Size relationship	.039 (.029)	.019 (.026)	.002 (.026)	.028 (.032)	.042 (.031)	.039 (.032)	-.001 (.030)
Size synergy	-.025 (.133)	-.034 (.118)	-.012 (.116)	.162 (.069)	.129 (.069)	.134 (.070)	-.043 (.147)
Adj. target ROE	-.482 (.494)	-.202 (.440)	-.218 (.431)	-.118 (.388)	-.212 (.379)	-.204 (.380)	.115 (.447)
F	1.898**	3.249**	3.471**	2.120**	2.404**	2.392**	4.258**
R ²	.376	.514	.536	.319	.356	.360	.664
Adjusted R ²	.178	.356	.382	.169	.208	.209	.507
N	240	240	240	331	331	331	183

* $p < .05$; ** $p < .01$; one-tailed tests for study variables, two-tailed tests for controls.

* The dependent variable is the premium paid by the acquiring firm. Results for the 47 industry control variables are not reported but are available from the author. Unstandardized coefficients are reported. Standard errors are in parentheses.

Table 4 presents the results of the Poisson regression analysis used to test whether acquirors use more investment banking firms under conditions of uncertainty (H2). Table 4 shows that, independent of the control variables, target uncertainty is positively related to the number of investment banking firms used by the acquiror on a transaction. Thus acquiring firms use more investment banking firms under conditions of target valuation uncertainty.

Table 4

Poisson Regression of the Determinants of Number of Investment Banking Firms Used by the Acquiror*	
Variable	
Target uncertainty	.0005* (.0003)
Controls	
N Competitive bids	.096 (.076)
Deal value	.00008** (.00002)
Number of target IBankers	.098 (.065)
Intercept	-.017 (.079)
N	453
D.f.	4
Chi-square	100.27 ($p < .0001$)

* $p < .05$; ** $p < .01$; one-tailed tests used for study variable, two-tailed for controls.
 * The dependent variable is the number of investment banking firms used by the acquiring firm. Unstandardized coefficients are reported. Standard errors are in parentheses.

The results of the tests of investment banker effects are presented in models 4–6 in Table 3, above. These analyses were done for those 331 transactions by acquirors who used one or more investment banking firms and whose investment banking firms were involved in multiple transactions. As shown in model 5, the premium paid by a firm on a transaction involving an investment banking firm is positively related to prior premiums paid by other firms on transactions involving that same investment banking firm, supporting H3a. Adjusted R^2 increases from .169 for the base model for these 331 transactions to .208 for the base model plus variables for premiums paid by other firms using the same investment banking firm and premiums paid by firms using other investment banking firms.

As shown in model 6 in Table 3, there is no support for the idea that the relationship between premiums paid by acquirors and others using the same investment banking firm is affected by uncertainty (H3b). The interaction of uncertainty and the premiums paid by other firms on transactions involving the acquiror's investment banker(s) is not significant. Investment banker relationships affect premiums, but their effect does not vary with target valuation uncertainty. There is no support for H3c, either.

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There is no relationship between premiums paid by the acquiror and premiums paid on prior transactions involving investment bankers not used by the acquiror. This suggests there is a firm-specific effect for investment banking firms on premiums. Although the high collinearity between "own banker premium" and "other banker premium" (.905) could be proposed as the reason for the null effect for other banker premium, the results of two sets of analyses (available from the author) suggest that it is not. First, the explained variance for the model with own banker premium alone (.246) is higher than the model with both own banker and other banker premium (.208). Second, in models including only other banker premium (not own banker premium), the coefficient on other banker premium is not significant. These results suggest that other banker premium is not related to the dependent variable, and multicollinearity is unlikely to be the cause for the null effect.

There is an alternative explanation that the above evidence does not completely rule out. Since some investment banking firms specialize in certain industries (Eccles and Crane, 1988), firms may be deciding to acquire in certain industries (which are associated with specific premiums) and then select an investment banking firm on that basis. If this explanation holds, then similarity among the clients of investment banking firms may be due to this selection and not due to the investment bankers spreading models among firms. An acquiror's selecting an investment banker first and then following that banker's advice to acquire in a certain industry still supports the idea that investment bankers are spreading models. If the investment banker selection occurs after the decision to acquire in an industry, however, then evidence consistent with H3a (acquirors pay premiums similar to others using the same investment banker) does not support the model-spreading hypothesis. To test the validity of this alternative explanation, I omitted all transactions involving an investment banker whose other clients bought firms in the same industry as the acquiring firm and reran the analyses. This is a conservative test, in that firms that selected the investment banker first and then decided to acquire in that banker's specialist industry (which supports the model-spreading hypothesis) are excluded from the analysis. The coefficient on the variable representing the premiums paid by other firms using the same investment banking firm, while smaller, remains positive and significant. Thus, the H3a relationship is not exclusively due to firms selecting investment bankers based on their industry expertise: Investment banking firms are also spreading premium models among firms.

Finally, model 7 in Table 3 includes both tied-to firm premiums and investment banker premiums and their interactions with uncertainty. This model was run on those 183 transactions by acquirors who were both interlocked with other acquirors and used investment bankers involved in multiple transactions. The results of this analysis show the robustness of the results. Even in a sample of 183 transactions, the significance of the results found in other, larger samples remains. Additionally, given that the coefficients on both the interlock partner premium and the

investment banker premium variables are significant, the effects of interlocks and investment banking firms on premiums are independent for firms that have both forms of relationships. Finally, since the interaction of interlocks and uncertainty is still significant in this model, the lack of results for the interaction of the premium paid by other firms on transactions involving the acquiror's investment banker and uncertainty is probably not due to the lower variance in the uncertainty variable resulting from analyzing only those transactions involving investment bankers.

Approximately 24 percent of the acquisitions in the above analyses are multiple transactions by the same acquiring firm. To see whether the nonindependence inherent in multiple acquisitions completed by the same firm affected the results, all models were reestimated after dropping the multiple-transaction acquirors. The significance of the hypothesized effects was unchanged in these models.

Control variables. Consistent with prior research, the results of this study show strong support for the effects of competition on premiums and little support for effects due to the financial conditions of the target. As shown in Table 3, more competitive bids are associated with higher premiums, but there is a general lack of effects on premiums for synergies and the financial condition of the target.² There is no evidence that synergistic acquisitions are associated with higher premiums. There is some evidence, however, that premiums were higher in 1988 than 1986 and that the industry of the target firm affects the premium paid.

DISCUSSION AND CONCLUSION

Overall, the results provide evidence that interorganizational linkages with professional firms and interlock partners affect acquisition premiums, and their effect is independent of the effects of competition, synergies, the financial condition of the target, and macroeconomic and industry factors. Acquirors pay premiums similar to the premiums paid by their interlock partners. Investment bankers are spreading premium models and information from firm to firm, resulting in premiums that are (1) the same across firms they have relationships with; and (2) different from firms they do not have relationships with.

The results of this study are consistent with others showing a relationship between interlocks and the adoption of firm practices (Davis, 1991; Mizruchi, 1992; Haunschild, 1993; Palmer, Jennings, and Zhou, 1993) and are consistent with Useem's (1984) proposition that interlocks are a tool for firms to use in their scan of the business environment. The results of this study also add to evidence that social embeddedness (Granovetter, 1985), in the form of interlock and professional firm relationships, affects significant economic decisions. These relationships, however, are not the only explanations for premiums. Competition for the target is actually the strongest individual predictor of high premiums. Traditional economic explanations also appear to be valid, as some of the variables that capture their effects (e.g., industry of the target, year the acquisition occurred) are significant. These results suggest that economic,

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Results of other models, available from the author, show that the financial condition of the acquiror also has no effect on premiums.

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competitive, and social context factors are all important in the premium determination process. The significance of the social variables is worth recognizing, however. Including interlock relationships adds significant explanatory power to the models, nearly doubling the adjusted R^2 .

This study extends our knowledge of the effects of uncertainty on the interorganizational transfer of routines, practices, and structures. Various theories propose that uncertainty is the driving force behind interorganizational transfers (e.g., DiMaggio and Powell, 1983). Yet there is a lack of empirical research showing the influence of uncertainty. This study shows that the level of uncertainty affects some forms of interorganizational transfers—those occurring through director interlocks. Interestingly, uncertainty appears to affect the transfer of practices differentially through various types of interorganizational relationships. Uncertainty affects only transfers through interlocks, not transfers through investment bankers. Uncertainty affects the creation of investment banking relationships, but once they are created, uncertainty does not affect their role in transferring premium practices from firm to firm.

The answer to why uncertainty affects only transfers through interlocks, and not those through professional firms, may lie in the nature of the relationship between firms, their investment bankers, and their interlock partners. Hiring investment bankers to advise on a transaction is likely to result in commitment to the idea that the investment bankers are the “experts,” and their advice will be followed. As a result, all the effects of uncertainty operate early in the investment banking relationship. Once the relationship with an investment banking firm is established, there are no further uncertainty effects. The nature of the interlock relationship, however, is different. It is unlikely that interlock relationships will be formed on the basis of a single transaction, and interlock partners are not likely to be seen as “experts” in the same way professional firms are. This means that uncertainty is more likely to affect the influence of interlocks.

These differential results point to some limitations in the current state of our knowledge of interorganizational relationships and uncertainty. First, while the above explanation for the differential effects of uncertainty on different forms of relationships may appear plausible, it is necessarily speculative. Studies designed to identify the reasons for these differential effects would be useful. Second, there is some question as to whether uncertainty is necessary for interorganizational effects to occur. Neoinstitutional theories suggest that it is, that only under conditions of uncertainty will organizations imitate other organizations (DiMaggio and Powell, 1983). The results of this study suggest that it is not. Even controlling for the level of transaction uncertainty, premium practices are transferred from both interlock partners and professional firms. That uncertainty might not be necessary for interorganizational transfers to occur is consistent with theories of obligatory action (March, 1981), which say that if enough social actors are doing X, then X becomes taken for granted and others

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will undertake X without thinking. The simple number of others performing an act causes action, not uncertainty. That uncertainty is not necessary for interorganizational transfers is also consistent with some social psychology theories (Moscovici, 1976) and with strategic choice theories. Strategic choice theories imply that strategic imitation of competitors' activities occurs regardless of the level of uncertainty (Porter, 1980; Lieberman and Montgomery, 1988).

Because managers may be experiencing uncertainty that is not reflected in the transaction uncertainty variable, the results of this study cannot definitely answer the question of whether uncertainty is necessary for interorganizational transfers. There are probably few situations, however, in which absolutely no uncertainty exists. This suggests that addressing the issues of what the various sources of uncertainty are and how important they are in a given situation is important. In this study, uncertainty about the state of the target is important—it affects interorganizational relationships. Future research exploring other sources of uncertainty and their effects on interorganizational transfers would be valuable, such as uncertainty arising from the actions of competitors and the state of the economy. Additionally, while the transaction uncertainty variable used in this study is fairly concrete, the concept of uncertainty in organization theory remains amorphous (e.g., Leblebici and Salancik, 1982; Galaskiewicz, 1985) and could be improved by identifying specific sources of uncertainty and the effects of varying degrees of uncertainty on interorganizational relationships and transfers.

The results of this study add to empirical evidence directly showing the interorganizational transfer of routines, practices, and structures (Galaskiewicz and Wasserman, 1989; Davis, 1991; Mizuchi, 1992; Haunschild, 1993; Palmer, Jennings, and Zhou, 1993). Our understanding of the scope of these transfers is enhanced by adding direct empirical evidence from this study showing that professional firms also affect transfers. Researchers studying professional firms have investigated the conditions surrounding the formation and dissolution of their relationships (Levinthal and Fichman, 1988; Baker, 1990), but the role of uncertainty in the formation of these relationships has not been studied. By showing that professional firm relationships are formed under conditions of uncertainty, this study adds to our knowledge of the determinants of these relationships. Additionally, there are studies that propose that human resource professionals diffuse personnel practices (Baron, Dobbin, and Jennings, 1986; Dobbin et al., 1988; Edelman, 1990), but these studies do not directly measure the transfer of a practice from one organization to another. Thus there are no studies that directly measure the role of professional firms in the diffusion of practices. By showing that professional firms diffuse practices from one company to another, this study also adds to our knowledge about the role of professional firms and the outcomes of firms' relationships with them.

One limitation of this study is a lack of direct indicators of what is being transmitted through director interlocks and

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investment banking firm relationships. Three types of information that could be transferred are concrete how-to information about determining premiums, financial information about targets and what they are worth, and premium norms. Future studies could directly measure the flow of information and influence across different types of interorganizational relationships.

While only two forms of relationships, interlocks and relationships with professional firms, were studied here, there exist many other types of relationships that might be sources of influence on firm practices and structures, including relationships with institutional investors, partners in cooperative arrangements like joint ventures and R&D consortia, customers, and suppliers. By studying firms in their interorganizational contexts, we may learn how these relationships influence the firms involved and how uncertainty affects transfers through various types of relationships. Organizational practices and structures other than acquisition premiums are likely to be affected by these relationships. The recent proliferation of total-quality-management practices, for example, may have been affected by relationships with interlock partners, consultants, and other professional firms. Organizational researchers need to investigate the effects of these interorganizational relationships if we are to understand how and why organizations grow and change.

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