Initial Public Offerings and Organizational Governance: Evidence from Joint Ventures and Acquisitions

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December 2005

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Abstract

Drawing upon information economics, we investigate firms' decisions to form joint ventures with or acquire newly-public firms. The core issue we examine is whether signals sent during IPOs have efficiency implications for organizational governance choices concerning issuing firms. Our focus is on issuers' associations with reputable investment banks and with venture capitalists, both of which engage in vetting and bonding activities for firms that go public. The results demonstrate that issuers with reputable investment banks are more likely to be acquired by, rather than collaborate with, other firms compared to issuers with less reputable underwriters. Venture capitalist backing appears to be a useful signal in 'colder' IPO markets and for potential acquirers with dissimilar knowledge bases vis-à-vis the issuing firm. We find strong evidence that issuers tend to partner with, rather than be acquired by, firms in inter-industry combinations compared to horizontal deals, which is also consistent with the theory that joint ventures mitigate the risk of adverse selection.

One of the most important judgments a firm can make concerning its collaborative strategy is whether a particular cooperative arrangement is, in fact, an efficient choice relative to alternatives such as an acquisition or organic growth. It is telling, therefore, that a recent survey found 82 percent of executives view alliances and acquisitions as accomplishing the same growth objectives, yet only 14 percent have specific criteria in place for choosing between them (Dyer, Kale, and Singh, 2004). During the last two decades, scholars in strategy and economics have begun to explicate the theoretical criteria that can guide such investment decisions by differentiating alliances and acquisitions as organizational governance forms. For instance, alliances offer some contractual supports for coordination while preserving incentive intensity (Teece, 1992), yet they are also susceptible to various exchange hazards that give rise to unified ownership (e.g., Williamson, 1991, 2002). Other theories point to the value of alliances over acquisitions under conditions of uncertainty and as transitional organizational arrangements geared for market exploration (e.g., Kogut, 1991; Mitchell and Singh, 1992).

One such theory, which serves as the point of departure for our analysis, focuses on the inefficiencies brought about by the asymmetric information held by exchange parties in M&A, which joint ventures can help relieve. More specifically, extending the concept of the 'market for lemons' from product markets (Akerlof, 1970) to intermediate markets for corporate resources raises the following problem: Often an acquirer finds it challenging to ascertain the quality of a target firm's resources, and the seller has an incentive to inflate claims of these resources' worth (e.g., Ravenscraft and Scherer, 1987). As a consequence, some acquisitions fall through, others become mired in protracted negotiations, sellers receive discounted offer prices, and buyers bear the risk of adverse selection. Joint ventures can be an attractive alternative since they can be terminated at low cost; buyers can experiment with the target's resources; and joint ventures' governance properties (e.g., shared ownership and control) induce knowledge sharing (Balakrishnan and Koza, 1993). This theory therefore complements transaction cost perspectives of organizational governance by highlighting the *ex ante* exchange hazards surrounding such deals (c.f., Gatignon and Anderson, 1988; Pisano, 1989; Oxley, 1997; Capron and Mitchell, 2005).

Nevertheless, the development of this theory in corporate strategy has been hampered by two factors. First, studies have not taken into account alternative remedies that have been shown to mitigate the risk of adverse selection in many other market contexts (e.g., Stiglitz, 2000; Garmaise and Moskowitz, 2004). Second, there have been few studies in corporate strategy that provide tests of aspects of this theory, and this work has produced mixed findings on the merits of joint ventures (e.g., Koh and Venkatraman, 1991; Balakrishnan and Koza, 1993; Hennart and Reddy, 1997; Reuer and Koza, 2000).

In this paper, we take up these two issues by investigating firms' decisions to partner with or acquire newly-public firms. This setting enables us to exploit the information that is released on an issuing firm surrounding its going-public event. The core research question that we address is whether institutional features of the IPO process convey signals that affect firms' subsequent organizational governance choices involving newly-public firms. Specifically, we develop the argument that issuers' associations with reputable investment banks and venture capitalists can convey the issuing firm's quality. We then turn to possible contingencies that might alter the signaling value of these relationships, arguing that the volume of IPO activity and distribution of knowledge in M&A markets shape the benefits of investment bank reputation and venture capitalist backing.

The present study contributes to research on external corporate development in several respects. First, on a broad level, our theory and evidence suggest that the operation of the IPO market can have efficiency implications for firms' organizational governance choices. There has been emerging research interest in IPOs by strategy and organizational scholars, but IPOs typically have been ignored, implicitly assuming that IPOs are financing choices that are independent of other corporate strategy phenomena. Second, by highlighting the value of issuing firms' signaling opportunities through associations with venture capitalists and investment banks (Gulati and Higgins, 2003), our arguments and findings broaden the remedies for adverse selection in M&A markets that might be contemplated. Finally, this paper also revisits the mixed evidence concerning the relationship between partner relatedness and organizational governance choices or outcomes. For firms' decisions to partner with or acquire newly-public target firms, our findings lend strong support to predictions from information economics.

THEORY AND HYPOTHESES

Signaling Effects of Initial Public Offerings

Recent anecdotal evidence and several academic studies reveal that initial public offerings can shape a firm's visibility and credibility. The information that is produced during the going-public event can have important ramifications for M&A or other markets in which firms find themselves (e.g., Mikelson *et al.*, 1997). For instance, descriptive findings on Italian IPOs revealed that the controlling interest in newly-public firms was acquired by an outsider 13.6 percent of the time, which was more than twice as often as for the Italian economy in general (Pagano *et al.*, 1998). As a practical example, eBay sought to purchase PayPal, a privately held concern, in order to acquire its antifraud capabilities. The two firms could not come to terms on price during their M&A negotiations, but once PayPal went public and the equity market confirmed the value PayPal claimed it was worth, eBay proceeded with the deal. Other firms such as Advertising.com, Borden Chemical, Brightmail, and Noveon were acquired when they merely filed to go public (Hibbard, 2004). These cases illustrate the broader phenomenon of firms being "picked off" surrounding their IPOs (e.g., Field and Karpoff, 2002), which suggests important potential connections between IPOs and M&A that have not previously been examined.

These initial findings also suggest that the operation of the IPO market potentially has consequences for the efficiency of other firms' external corporate development decisions and their organizational governance choices. When a firm goes public, information is released and certified on the issuer through auditing efforts, road shows, prospectuses, and so forth (Blowers *et al.*, 1999). Perhaps more importantly, equity markets work to aggregate heterogeneous information on the firm into its stock price (Hellwig, 1980), which also can be useful to reduce knowledge gaps between bidders and sellers in the M&A market and therefore facilitate transactions between otherwise informed and uninformed agents (e.g., Milgrom and Stokey, 1982). A common theme running through the IPO literature is that the going public event generally reduces information asymmetries between the firm and other agents (e.g., investors, competitors, and exchange partners more generally).

The issuing firm can also use particular features of the IPO process to signal its value to others and thereby reduce the effects of information asymmetries. In fact, a significant literature is developing in strategy and financial economics on the heterogeneity that exists across IPOs in the signals they send as well on the implications of these potential signals for firms' valuations, financing opportunities, long-term performance, and even survival (e.g., Welch, 1989; Michaely and Shaw, 1994; Ang and Brau, 2003; Gulati and Higgins, 2003; Pollock, 2004; Mudambi and Treichel, 2005). While significant progress has been made in identifying the types of signals that exist and their consequences, this work has not been connected to the research on external corporate development and organizational governance. By contrast, organizational governance research has examined joint ventures as investment devices that can reduce asymmetric information directly, but this stream of work has not considered alternative ways in which firms can mitigate the risk of adverse selection. Given the theoretical importance of signals to applications of information economics, as well as the practical relevance of IPO signals and acquisitions of newly-public firms, investigation of firms' choices to acquire or partner with newly-public firms is useful and interesting as a means of extending information economics in the organizational governance and external corporate development settings. As will be discussed below, our focus is on the signaling benefits provided by reputable investment banks as well as venture capitalists. These associations have been examined in recent studies of IPOs, and they are attractive for our purposes because they are interorganizational partnerships that represent important institutional features of the IPO process.

Investment bank reputation. Relations between reputable investment banks and issuing firms can address acquirers' risk of adverse selection. Issuers associated with reputable investment banks are able to signal their quality and differentiate themselves from lower quality firms via two related theoretical mechanisms. First, *bonding* is possible because investment banks have reputation capital at stake, which curbs their incentives to inflate claims on the issuing firm's quality or otherwise engage in opportunistic behavior during the IPO process (Draho, 2004). Investment banks engage in repeat business with investors, and future exchanges create a shadow of the future on behavior in the focal IPO (Axelrod, 1984). By contrast, an issuer finds it more difficult to develop or benefit from reputation capital in this context since the IPO represents a one-shot transaction, so the issuer stands to gain from temporarily borrowing the underwriter's reputation (e.g., Riley, 2001).

Second, *risk signaling* occurs due to investment banks' desire to take public those firms that present less risk to their accumulated reputation capital (Carter and Manaster, 1990). Segmentation in the market for investment banking services therefore exists in that the most reputable investment banks are unlikely to take public firms that are more speculative or expose the firm to legal liabilities (Tinic, 1988; Beatty and Welch, 1996). Reputable investment banks instead focus on equity offerings of established public firms, or they prioritize lower-risk IPOs. Evidence exists, for instance, that issuers taken public by reputable investment banks exhibit better long-term performance than issuers underwritten by less reputable investment banks (Michaely and Shaw, 1994). In sum, if the bonding hypothesis deals with changes in incentives to behave opportunistically under repeat versus one-shot transactions, the risk signaling hypothesis concerns the investment bank's vetting of firms to take public in the first place.

Both theoretical mechanisms suggest that potential partners will be less likely to joint venture with rather than acquire newly-public firms associated with reputable investment banks. Bonding serves to increase the credibility of the issuer, and risk signaling suggests that would-be acquirers can benefit from the interorganizational partnership decisions previously made by the most reputable investment banks. We therefore hypothesize:

H1: The likelihood of joint venture over acquisition of a newly-public firm will be negatively related to the reputation of the issuer's investment bank.

Venture capitalist backing. Just as firms' associations with reputable investment banks can offer signals that spill over from the IPO market to the market for corporate resources, we hypothesize that relationships with venture capitalists can shape other firms' joint venture versus acquisition decisions concerning newly-public firms. Prior research has discussed a number of ways in which venture capitalist backing can signal quality to prospective investors, and several of the arguments parallel the above logic. First of all, venture capitalists are also selective in making investments in businesses. Megginson and Weiss (1991) report that venture capitalists typically fund less than one percent of the proposals they receive. Venture capitalists are also selective in making subsequent rounds of investment, which amount to the exercise of call options they hold, as uncertainties are resolved over time (Hurry, Miller, and Bowman, 1992). Not only can the presence of a venture capitalist provide an endorsement of the firm's quality due to a selection effect, but a VC can also add directly to the quality of a firm by contributing its network of firms, assisting in the firm's formulation and implementation of strategy, and hiring key personnel that can also advance a firm's competitiveness (e.g., Brav and Gompers, 1997). These costly investments are also consistent with VCs' selectivity in making investments in new ventures and in developing these firms. Compared to investment banks, venture capitalists often have longer relations with issuers, and some venture capitalists also specialize in a limited number of industries, lending additional weight to their selection choices (e.g., Jain and Kini, 1995).

Bonding effects are also plausible since VCs engage in repeat business with other intermediaries and investors, which enables the accumulation of reputation capital a VC would like to preserve. Some researchers have suggested, however, that VCs may instead 'window-dress' a firm prior to its IPO and then cash out immediately thereafter, yet two factors work against this behavior in general: Not only do VCs rely on their reputations and often engage in new issues, but their performance is monitored by peers as well as underwriters and the broader investment community, such that outside investors are able to anticipate opportunistic behavior and discount share valuations accordingly (Jain and Kini, 1995). Thus, while there might be debate on the strength of the bonding hypothesis in different investment contexts, the arguments above suggest that the information content embedded in venture capitalist backing potentially offers a signal of firm quality. If such VC backing is present, a potential acquirer may see less need to turn to a joint venture to manage the risk of adverse selection and reduce information asymmetries, while in the absence of endorsements and prior screening by VCs a firm is more likely to find a joint venture attractive over an acquisition.

H2: The likelihood of joint venture over acquisition of a newly-public firm will be lower for an issuer with venture capitalist backing than other issuers.

IPO and M&A Market Contingencies

Recent research argues that the value attached to signals from interorganizational partnerships hinges upon the market environment of IPO transactions (Gulati and Higgins, 2003). This can be because the cost of engaging in the signaling activity adjusts as market environments change over time or because the value of the signal varies across different recipients. Given that the present study examines both IPOs and subsequent M&A transactions, features of both markets are likely to influence the importance of investment bank reputation and venture capitalist backing. In the context of the IPO market, one of the more salient environmental contingencies affecting the impact of signals is the level of activity in the broader IPO market. In the M&A market context, the value of signals will vary across bidders as a function of their knowledge bases vis-à-vis the target firm's, so we also wish to capture this source of heterogeneity in examining the signaling value of investment bank reputation and VC backing.

IPO market activity. One of the notable features of IPO markets that has been studied extensively in financial economics is the presence of 'hot' and 'cold' IPO markets, or positive autocorrelation in the volume of IPO activity (Jenkinson and Ljungqvist, 2001). This research has examined whether these cycles of activity are consistent with stock market efficiency, what benefits and costs of going public might vary over time to explain these aggregate trends, and whether firms can time the exercise of their option to go public based on information that is conveyed by other issuers or by equity investors' excessive optimism.

The volume of activity in IPO markets potentially alters the value of signals sent by investment bank reputation and venture capitalist backing in several ways. First, during hot markets, it is considerably easier for firms to go public compared to when IPO markets are cold, which potentially undermines the risk signaling effect. During earlier years, there appears to have been little difference in the characteristics of firms that went public during hot and cold cycles (Helwege and Liang, 2004), but this seems to have changed. For example, it was not uncommon for reputable investment banks to take public firms with negative earnings during the late 1990s (i.e., 79 percent of such IPOs), but it in earlier decades it was rare for investment banks to underwrite firms without at least four years of positive earnings (Ritter and Welch, 2002).

Second, the endorsement effects of investment bank reputation and venture capitalist backing might change across IPO market contexts based on these institutions' incentives as well as their capabilities to manage higher deal volumes. Lowry (2002), for instance, finds that underwriters take many firms public following periods of high underpricing, suggesting that hot-market IPOs may be driven in part by a desire to obtain higher-than-expected public valuations. Others argue that venture capitalists exhibit overconfidence and information overload in taking firms public in such IPO markets, which can bias their judgments about individual firms (e.g., Gulati and Higgins, 2003). The fact that there is simply more 'noise' in the system in hot markets compared to cold markets also suggests that potential bidders are less apt to attend to the detailed information conveyed by particular issuers and their interorganizational partnerships. Thus, as IPO volumes rise in hot markets, signals on particular firms may be less likely to received by an individual exchange partner, separating equilibria may be less likely to exist as it is easier to go public, and other motives that drive IPOs potentially work against the bonding and risk signaling effects noted earlier. These lines of argument indicate that the impact of investment bank reputation and VC backing is likely to be most pronounced when IPO volumes are lower.

H3a: The signaling effect of investment bank reputation will be inversely related to IPO activity.

H3b: The signaling effect of venture capitalist backing will be inversely related to IPO activity.

M&A market participants. Just as the IPO market environment potentially shapes the signaling value of issuers' relations with investment banks and venture capitalists, features of the M&A market can also influence the benefits of these signals. The previous hypotheses implicitly assume that signals sent on the newly-public firm will be valuable to all suitors, yet it should be emphasized that the benefits of these signals can vary greatly across potential acquirers. Alternatively stated, the efficiency implications of firms' organizational governance decisions will not only reflect the presence or absence of signals for the issuing firm, but also the characteristics of the buyer-seller dyad since these characteristics themselves affect the value of these signals for a particular exchange partner.

Prior research applying information economics to the corporate strategy context would suggest that differences in the knowledge bases of transacting parties represent an important dyadic contingency influencing the benefits that signals can offer decision-makers (e.g., Balakrishnan and Koza, 1993). At one extreme, in intra-industry deals, firms seeking to combine resources with the newly-public firm are more likely to be familiar with such firms' resources, buyers and suppliers, and management capabilities (e.g., Montgomery and Hariharan, 1991). The fact that the partner is better able to judge the quality of the newly-public firm's resources implies that risk signaling and bonding are less valuable since information gaps are lower. By contrast, in inter-industry deals, or transactions in which the knowledge bases of the parties diverge greatly, the partner firm will be in a worse position to evaluate the issuer's resources and claims (e.g., Balakrishnan and Koza, 1993).

H4a: The signaling effect of investment bank reputation will be greater for partners with knowledge bases dissimilar to the issuing firm's.

H4b: The signaling effect of venture capitalist backing will be greater for partners with knowledge bases dissimilar to the issuing firm's.

METHODS

Sample

The base data for our study were drawn from the Security Data Corporation (SDC) database maintained by Thomson Financial. This database provides comprehensive firm- and transaction-level details on firms' external corporate growth initiatives and financing activities. Separate modules exist, for example, on venture capital, the issuance of various securities, mergers and acquisitions, alliances, corporate governance, and so forth. The SDC database canvasses public information, including SEC filings, wire sources, news publications, trade sources, etc. to obtain data on individual transactions by firms. This database has been used in many prior studies of acquisitions and equity issuance, and more recently this database has begun to track information on various forms of strategic alliances.

We first examined all initial public offerings of common shares by US firms during the 1986-2001 time frame. We excluded transactions involving real-estate investment trusts, investment funds, equity carveouts involving units of diversified firms, LBOs, and offerings by firms operating in the financial services sector. We then merged this information with data on acquisitions and alliances contained in separate modules of the SDC database. Other studies that have tracked newly-public firms and their propensity to be acquired have used time windows as long as ten years (e.g., Mikkelson, Partch, and Shah, 1997), but a tradeoff exists between using a long time window to be more inclusive, but for which information produced at the time of the IPO might not be relevant, and using a short window that is more conservative yet restricts the sample. In order to balance these considerations and to be consistent with recent work on post-IPO acquisitions (e.g., Field and Karpoff, 2002), we initially sampled JVs by, and acquisitions involving the issuer up to five years after its IPO. As will be discussed below, we took several steps to consider this timing issue further, including estimating models using alternative time cutoff values, controlling for the time elapsed between the IPO and the other transactions, and testing for whether the effects of the explanatory variables vary over time.

A number of additional sampling screens were implemented for the alliance and acquisition transactions. In both cases the partner, or non-focal firm, had to be a US firm and an operating company as opposed to an investor group. Given that issuing firms might be partnered with prior to or after being acquired, we examined the first joint venture or acquisition transaction involving the newly-public company as a target. In order to address further the heterogeneity of acquisitions and partners' motives, we excluded deals that were minority investments or that involved the acquirer purchasing additional equity in a firm in which it already maintained an ownership position. Parallel steps were taken for the alliance transactions. Given that the literature upon which this study builds is concerned with joint ventures rather than the many forms of non-equity collaborative agreements in which firms might be engaged, our sample also focused on equity joint ventures and did not include various non-equity alliances such as licensing agreements, research collaborations, supply contracts, and so forth that have different theoretical characteristics. We also limited our attention to two-partner joint ventures, in order to enhance the comparability of the transactions and as a practical means of calculating the variables across joint venture and acquisition partners in a consistent fashion. As will be described below, after the IPO data were merged with the joint venture and acquisition data, we then merged this data with accounting and financial information provided by Compustat. After accounting for missing data, the base sample consisted of 345 transactions, 54 of which were joint ventures (i.e., 16 %) and 291 were acquisitions (i.e., 84 %).

We examined the distributions of the sample across sectors as well as time. The sector with the greatest number of deals was services, with 44.9 percent, followed by manufacturing, with 37.4 percent. In neither sector, however, was the incidence of joint ventures over acquisitions generally higher or lower than other sectors (i.e., $\chi^2 = 1.60$ (n.s.) and $\chi^2 = 2.17$ (n.s.), respectively). We also noted that the sample of firms followed a different distribution over time from the sample of all IPOs ($\chi^2 = 163.4$, $p<0.001$), with a greater number of observations in the more recent years of the time-window (e.g., Ibbotson, Sindelar, and Ritter, 1994), which reflects in part improvements in the joint venture and acquisition data over time. Detailed descriptive statistics for the sample appear in the results section below.

Measures and Data

Joint venture. The dependent variable for the analysis is a dichotomous measure indicating whether the parties used a joint venture versus an acquisition as a governance structure. Thus, *Joint venture* equals one for joint ventures with newly-public firms, and zero for acquisitions of newly-public firms. As noted above, other investments or contractual relationships such as non-equity alliances, toehold investments, acquisition of additional equity in partial acquisitions, etc. were not included. The governance structure for each transaction was obtained from the SDC database. Given that the dependent variable is dichotomous, we used logit models to examine the determinants of firms' joint venture versus acquisition decisions.

Explanatory variables. Our first theoretical variable is the reputation of the lead investment bank that took the target firm public. We measured *Investment bank reputation* using the index initially developed by Carter and Manaster (1990). This measure is constructed based upon the positions that investment banks occupy in tombstone announcements listing members of the underwriting syndicate and it has been used widely in finance as well as organizational and strategic management research (e.g., Podolny, 1994; Gulati and Higgins, 2003). For banks that always appear in the highest bracket, a ranking of nine is assigned, and investment banks receive lower rankings based on their position in successive tombstone announcements. We used the data on investment bank reputation from Loughran and Ritter (2004) as it utilizes expert knowledge for exceptional cases, covers a long period of time, and updates prior data sources to address the most recent transactions.

The second theoretical variable is whether or not the issuing firm was associated with a venture capitalist at the time of the IPO. *Venture capitalist backing* equals 1 if the issuer was venture capitalist backed, and zero otherwise. Data for this variable were obtained from the new issues module of the SDC database. We examined the incidence of venture capital backing across time in order to compare our sample with other research on IPOs and venture capital activity that do not sample on subsequent corporate development activity. For example, the percentage of the sampled IPOs that were venture-backed was 40% in the 1985-1989 period, 48.3% in 1990-1994, and 54.0 percent in 1995-1997, which compares with 9%, 28%, and 31%, respectively, in Gompers and Lerner (1999). The higher representation of VC-backed IPOs in our sample potentially reflects the impact that association with venture capitalists and its correlates (e.g., interfirm networks, underpricing, etc.) has on attracting both joint venture partners and bidders in the M&A market.

In order to examine the potential contingent effects of investment bank reputation and venture capitalist backing as well as to control for the effects of the IPO market environment and differences in exchange parties' knowledge bases, measures for *IPO activity* and *Knowledge distance* were incorporated in the model as interaction terms as well as factors that might directly influence firms' organizational governance choices. *IPO activity* was proxied as the volume of IPO deals in the year in which the firm went public. Data for this variable were obtained from Ibbotson, Sindelar, and Ritter (1994). The authors have updated this data to the present time and have made it publicly available. The average number of IPOs during the 1986-2001 time period is 475, or slightly under two IPOs per trading day each year (i.e., 475/253 = 1.88). During this time period, the maximum number of IPOs was 953 in 1986, or roughly twice the average value, and the minimum number was 84, in 2001.

The knowledge distance construct that we used was first introduced in corporate strategy research by Farjoun (1994) and has been subsequently utilized by other scholars in the M&A literature (e.g., Chang, 1996) to address limitations in using dummy variables based on SIC codes to examine product-market diversification or the relationship between exchange partners conducting M&A. This variable measures the Euclidian distance between partner's industries based on their knowledge requirements, as proxied by their respective employment distributions. Data for the calculation of this variable are provided from the Occupation Employment Survey from the Bureau of Labor Statistics, which offers information on the distribution of employment across 823 occupational categories within industries at the 3-digit SIC level (e.g., Coff, 1999). Because dummy variables constructed from firms' SIC codes have frequently been used in prior research to examine adverse selection in firms' external corporate development activities, we also used this information as a robustness check to distinguish inter-industry and intra-industry transactions, and the same interpretations as those presented below were obtained.

Control variables. We incorporated a series of controls for attributes of the target and partner firms that might be related to the explanatory variables discussed above as well as to the governance structure for the focal transaction. At the target firm level, we first controlled for the issuing firm's growth opportunities since joint ventures are suited for sequential investment (Kogut, 1991), and venture capitalists' investments are similarly structured (e.g., Draho, 2004). We measured the issuing firm's growth opportunities as its *Tobin's Q*, following the approach suggested by Chung and Pruitt (1994). Data for this measure were obtained from the Compustat data files. We next controlled for the target firm's underpricing, or its first day stock returns, as underpricing can reflect uncertainty about the firm and captures some of the different objectives held by issuing firms, venture capitalists, and investment bankers (e.g., Loughran and Ritter, 2004). *Target underpricing* was measured as the percentage change between the price at the close of trading on the first day and the IPO's offer price. Data for this measure were assembled from the SDC database. Finally, at the target firm level, we controlled for the size of the issuer as smaller targets are more efficient to integrate (Hennart and Reddy, 1997), yet they find it more difficult to attract the services of the most reputable investment banks (Chemmanur and Fulghieri, 1994).

Target size was measured as the issuing firm's total assets in millions of dollars. In order to remedy significant positive skewness that was evident for the pre-transformed measure, we took the natural log of total assets for use in the specifications. Data for this variable were obtained from Compustat.

At the level of the partner firm, we incorporated controls for the partner firm's acquisition and alliance experience. Partner firms that have significant acquisition experience are more likely to have developed acquisition management capabilities (e.g., Pennings, Barkema, and Douma, 1994) or possess other characteristics that might lead them to choose an acquisition over a joint venture. For similar reasons, we incorporated a control for the partner firm's experience with alliances. Specifically, we used the SDC database to track a firm's investments in alliances and acquisitions, and we then counted the numbers of alliances (i.e., *Alliance experience*) and acquisitions (i.e., *Acquisition experience*) that the firm had during the five years preceding the focal transaction. Both measures exhibited significant positive skewness, and because firms can have zero acquisition or alliance experience, we transformed the count measures by taking the log of one plus the number of prior alliances or acquisitions, respectively.

Finally, in attempt to address industry-level heterogeneity and the broader market environment of firms going public, we included a set of controls to reflect the timing of the IPO, the timing of the joint venture or acquisition, and the industry in which the deal occurred. *IPO clock* was measured as the number of days between the offering date of the IPO and the announcement date of the joint venture or acquisition. We also included a dummy variable to distinguish high tech and other target firms (i.e., *High-tech target* equals 1 or 0, respectively). We identified 45, 4-digit SIC codes making up high-tech industries using data provided by AeA, the nation's largest high-tech trade association. We also incorporated a series of indicator variables for the sectors in which the issuing firms reside.

RESULTS

Table 1 presents descriptive statistics for the sample as well as a correlation matrix. Sixteen percent of the observations were joint ventures, and eighty-four percent of the transactions were acquisitions. Forty-four percent of the targets operated in high-tech industries, and the high-tech targets were the ones that experienced the greatest IPO underpricing, were more likely to receive VC backing, and were more likely to attract partners from the same industry (all $p<0.001$). The average size of targets was \$310 million in total assets, and the average initial return for these firms was 32 percent. Larger targets tended to be associated with more reputable investment banks, which may reflect market segmentation in the services of investment banks (e.g., Chemmanur and Fulghieri, 1994) ($p<0.001$). On the buy side, partners engaged in two acquisitions and eleven alliances on average in the five years prior to the focal transaction. Roughly half of the transactions involved partners with different primary business' at the 2-digit SIC level (i.e., 46 percent), but this pattern differed markedly across joint ventures and acquisitions ($\chi^2=22.5$, $p<0.0001$). Specifically, 75 percent of the joint ventures involved parents from different primary businesses, while this percentage was roughly 41 percent for acquisitions. Finally, 76 percent of the lead underwriters had a reputation score of 8 or 9 on a nine-point scale, and 59 percent of the targets were backed by a venture capitalist at the time of the IPO. Firms associated with reputable investment bankers also tended to be backed by venture capitalists ($p<0.001$) and underprice more (Loughran and Ritter, 2004). Interestingly, while larger firms were more likely to be associated with reputable investment banks ($p<0.001$), they were less likely to be backed by venture capitalists ($p<0.01$). This relationship, and the fact that larger targets can be more cumbersome to acquire, might partially account for the fact that VC backing is negatively correlated with the choice of a JV over M&A ($p<0.001$), and the correlation for investment bank reputation is insignificant. The correlations among some of the variables in this table as well as the use of a series of interaction terms led us to standardize continuous variables prior to the formation of multiplicative terms in the logit models.

Insert Table 1 about here

Table 2 offers descriptive results on the incidence of joint ventures and acquisitions for the full sample as well as across target firm size categories based on the contingencies of investment bank reputation and VC backing. Several data patterns are interesting to note. First, for the size quintile representing the largest firms (i.e., column V) , the incidence of joint ventures over acquisitions rises to 26 percent, while the usage of joint ventures is lower for targets of smaller sizes (i.e., 10-17 percent).

Second, the incidence of reputable investment banks (defined here as those with reputation scores equaling 8 or 9 on a nine-point scale) and VC backing similarly changes across target size categories. For example, the smallest issuers (i.e., column I) employ reputable investment banks 45 percent of the time, and this figure rises to over 90 percent for the firms in the top two size quintiles. By contrast, of the smallest issuers, roughly 61 percent of these firms were backed by venture capitalists, and this figure falls to 46 percent for the largest firms in the sample. Third, the incidence of joint ventures over acquisitions varies according to whether or not a reputable investment bank took the target firm public. The values in rows four and five for the largest two sizes quintiles are difficult to interpret and compare since there so few firms lacking a reputable investment bank (i.e., n=5 and n=6, respectively, for columns IV and V). However, in columns II and III, it appears that the incidence of joint ventures over acquisitions is between 3-4 times as high when a reputable investment bank is absent compared to the case when the firm is taken public by a reputable I-bank, though this difference narrows for the smallest firms. Finally, backing by VCs likewise reduces the incidence of joint ventures over acquisitions, as can be seen by comparing the values in row 6 with those in row 7. Overall, firms partner with VC-backed firms 9.8 percent of the time, compared to 24.1 percent for non-VC backed firms (χ^2=12.93, $p<0.001$). For the largest firms without VC backing, the incidence of JVs rises from a sample average of 16 percent to over 35 percent.

Insert Table 2 about here

Table 3 presents the multivariate results from the logit models used to test the first two hypotheses on the roles of investment bank reputation and VC backing. In columns I and II, results are offered for the full sample. Column I contains the control variables alone, and column II represents the specification that includes the two theoretical covariates. Both models are significant at the 0.001 level, and a likelihood ratio test indicates that the two theoretical variables are jointly significant ($p<0.01$). Consistent with predictions, the reputation of the issuer's lead underwriter and venture capitalist backing both appear to decrease the likelihood of joint ventures over acquisitions (both $p<0.05$).

Insert Table 3 about here

As mentioned earlier, the sample is comprised of joint ventures and acquisitions occurring up to five years after a target firm's IPO. We noted that selecting a cutoff value for this time window involves a tradeoff between enhancing the sample size by lengthening the timeframe versus incorporating corporate investment decisions after the effects of the going-public transaction are apt to be at work. In order to address this issue of the time lag between the acquisition or joint venture transaction and the firms' IPO offering date, three additional steps were taken. First, we introduced a control, IPO clock, to account for the time elapsed between the two events. This variable took on a negative sign in some of the specifications, indicating that, holding all else constant, joint ventures are more likely to occur quickly after the IPO and acquisitions are more likely to occur later. While definitive conclusions cannot be made on this variable, its sign is consistent with the decline in newly-public firms' growth opportunities or operational performance after the going-public event (e.g., Mikkelson, Parth, and Shah, 1997), as well as the organizational disruption that IPOs and acquisitions can entail (Blowers *et al.*, 1999).

Second, we conducted subsample analyses based on the time elapsed from the IPO offering date to the acquisition or joint venture transaction. In columns III and IV, the same specifications as those appearing in columns I and II are presented, but for transactions occurring less than four years following the going-public event. Similarly, columns V and VI present results for a time window incorporating transactions less than three years after the IPO. Results from these four additional models indicate that the interpretations presented above are robust to the particular time cutoff employed. We also restricted the sample further using an age cutoff of two years. For this subsample, the investment bank reputation variable continued to be negative and significant ($p<0.05$), but the VC backing variable was insignificant, perhaps due to the loss in power as the sample size was reduced by one hundred observations.

Third, to determine if the effects of our theoretical covariates vary according to the time span between the IPO and the acquisition or joint venture transaction, we interacted the IPO clock variable with the investment bank reputation and venture capitalist backing variables, but both of these interaction terms were insignificant, indicating that the influence of these variables is not contingent upon the time since the going public event, within these alternative time frames.

Tests for the remaining hypotheses on the contingencies shaping the influence of investment bank reputation and venture capitalist backing appear in Table 4. Column I contains the control variables, column II augments this model with the direct effects of the theoretical variables, column III incorporates interaction terms between these variables and the variable for IPO activity in the year of the target firm's going-public event, column IV incorporates interaction terms between the theoretical covariates and the knowledge distance variable, and column V includes all of the interaction variables simultaneously.

Insert Table 4 about here

The results in column III indicate that the effects of VC backing are contingent upon IPO activity ($p<0.01$), but we see that the influence of investment bank reputation does not vary across hot and cold IPO markets. The more IPO activity that surrounds the target firm's initial public offering, the less impact venture capital backing has on the use of an M&A versus a joint venture. In contrast to H2, the large positive coefficient on the interaction term relative to the negative direct effect also reveals that VC backing does not have a overall negative impact on the choice of joint venture over acquisition. Venture capitalist backing has a negative impact on this choice, provided that the level of IPO activity is no larger than one standard deviation above the mean value. Evidently, when IPO volume is heavier, VCs' bonding and risk signaling effects disappear, perhaps due to factors such as information overload, overconfidence, or incentives to cash out during windows of opportunity.

Similar contingent effects of venture capitalist backing and investment bank reputation extend to comparisons across intra-industry and inter-industry acquisition or joint venture transactions (see columns IV and V). For instance, contrary to H4a, the negative influence of investment bank reputation on the decision to joint venture with versus acquire the target firm ($p<0.05$) is invariant to whether the partner operates in the target's core business or is diversifying from an industry with very different knowledge requirements. By contrast, and lending support for H4b, the negative effect of VC backing on the partner's decision to joint venture versus acquire becomes even stronger for industry outsiders compared to corporate investors operating in the target's core business. It is plausible that the absolute and contingent effects of investment bank reputation and VC backing might stem from the particular knowledge possessed by these institutions vis-à-vis the issuer versus overall bonding effects. Investment banks can engage in bonding as well as signal targets' risk attributes by their selection criteria, which appear to be no more or less valuable to industry insiders or outsiders. By contrast, VCs' longer association with the target and greater knowledge of the industry are apt to offer signals that are particularly valuable to partners from industries with different knowledge requirements.

Finally, the control variables deserve some comment. First, while sector fixed effects are jointly significant ($p<0.001$) as suggested earlier, the operation of targets in high-tech versus other industries does not influence whether the transaction is governed as a joint venture versus an acquisition. Second, the acquisition experience of the partner firms is, as expected, negatively related to their choice of joint ventures over acquisitions ($p<0.001$). This finding might reflect the development of acquisition capabilities (e.g., Pennings, Barkema, and Douma, 1994) or larger firm's abilities to structurally accommodate targets. The positive coefficient for target size is also consistent with the latter interpretation ($p<0.001$). Accounting data on the buy side tend to be more sparse, due in part to the presence of privately-held acquirers. However, to pursue this explanation further, we incorporated a measure of the target's size divided by the partner's size (in total assets) for a subsample of observations for which firm size is known on both sides of the transaction (e.g., Datta, 1991). This variable took on a positive sign ($p<0.01$), indicating that the larger the target is relative to the partner, the greater the likelihood that the partner proceeds with a joint venture rather than bearing the difficulties of acquiring a large firm (Hennart and Reddy, 1997). Third, Tobin's Q also has a positive coefficient ($p<0.001$), which is consistent with the view that joint ventures are organizational arrangements designed to exploit growth options (Kogut, 1991). Finally, the knowledge distance variable is positive and highly significant as well in all ten specifications ($p<0.001$), indicating that firms are more likely to choose JVs over acquisitions when transacting resources with firms in industries with dissimilar knowledge requirements.

DISCUSSION

The present study demonstrates that signals produced during the IPO process can have efficiency implications for firms' organizational governance choices concerning newly-public companies. When investigating potential signals that might be valuable to firms seeking to acquire or partner with newly-public firms, we focused on two types of financial intermediaries that represent important institutional features of the IPO process. Investment banks and venture capitalists not only engage in screening activities themselves, but they are involved in repeat business, have the potential to develop reputational capital, and thereby bond themselves to the firms they help take public. We also suggested that the signaling value of these relations might be contingent upon features of the IPO market as well as the market for corporate partners. During hot IPO markets, for instance, it is easier for many firms to go public, and separating equilibria are less likely to exist than in colder markets for new issues. It is also likely that partners residing in the issuing firm's industry are in a better position to judge its resources and management capabilities compared to firms operating in industries with dissimilar knowledge requirements. The present study's evidence suggests that the effects of VC backing appear more sensitive to these considerations than are the effects of relations with reputable investment banks, which do not appear to vary across hold and cold markets or across intra- and inter-industry deals.

This study extends prior research on firms' external corporate development activities and IPOs in several ways. First, at the broadest level, our findings present new evidence indicating the relevance of information spillovers across IPO and M&A markets, based on the idea that the operation of one can shape the efficiency of the other due to the information produced. Our study therefore provides one of the first steps in understanding the broader phenomenon of how IPOs might figure into M&A processes (e.g., Field and Karpoff, 2002) and produce information spillovers across markets for financial and real assets. Our results suggest that part of the value of going public consists in associations with institutions that can signal a firm's value to would-be acquirers.

Second, our results suggest that IPOs can be seen as part of an extended process of corporate development. The earliest research on strategic alliances (or M&A) considered their benefits and costs in isolation without regard to alternative organizational arrangements which might accomplish similar purposes. In the late 1980s and 1990s, alliance research framed the decision to partner in explicitly comparative terms, with many studies on the efficiency implications of decision to partner versus engage in internal development or acquisitions in a variety of strategic contexts (e.g., Gatignon and Anderson, 1988; Teece, 1992; Balakrishnan and Koza, 1993; Hennart and Reddy, 1997). However, this literature has not given attention to entrepreneurial targets and the potential roles played by IPOs for firms' corporate development processes. Often IPOs are depicted as a purely financing choice or as an end-state for entrepreneurial firms rather than as a strategic choice that can have implications for the future evolution of firms. In recent years, there has been growing research interest in IPOs by strategy and organizational scholars (e.g., Certo *et al.*, 2003; Stuart and Sorensen, 2003; Pollock, 2004), and this work has produced important insights on the roles of IPOs for new business formation and post-IPO survival. Our belief is that there are interesting opportunities to connect this stream of work to the strategy and economics research on firms' corporate development activities.

Our research also extends the stream of work on strategic alliances in several ways. Most research that examines the efficiency implications of strategic alliances relative to alternatives such as internal development or acquisitions has examined *ex post* exchange hazards such as hold-up, moral hazard, or the inefficiencies arising from structural integration and asset divestment. We believe there is value in attending to other forms of transaction costs identified by information economics, such as the inefficiencies associated with deliberating over the value of assets subject to private information or the inefficiencies associated with searching for exchange partners in the first place. Research that draws upon information economics and applies it to the alliance context has examined the role that asymmetric information play in firms' governance decisions for their external growth initiatives (e.g., Balakrishnan and Koza, 1993), and our study extends this work by examining the impact of various signals that can mitigate adverse selection and thereby allow firms to go forward with an acquisition rather than a joint venture at the margin. There might be other ways in which private firms can signal value to potential bidders, and research that considers other remedies to the risk of adverse selection would be valuable.

For instance, it is possible that interorganizational networks or trust might alter information flows or have an impact on the credibility of a target's claims in such a way that other methods of information production, or asocial remedies to this problem, are unnecessary (e.g., Beckman and Haunschild, 2002). Our study has also only begun to explore some of the contingencies shaping the value of signals and the potential interplay of social and asocial solutions. Additional research is needed that simultaneously compares various social and asocial means of addressing the problem of adverse selection in different markets and that tests particular contexts in which their efficiency differs.

In the alliance literature, there is very mixed evidence on firms' choices to partner or acquire for intra- and inter-industry transactions and the implications of these choices (e.g., Koh and Venkatraman, 1991; Balakrishnan and Koza, 1993; Hennart and Reddy, 1997; Reuer and Koza, 2000). We have offered a test of this relationship in the context of newly-public targets, and the evidence lends strong support to the prediction from information economics that firms are more likely to choose joint ventures over acquisitions in inter-industry transactions compared to horizontal deals. Studies that explicitly focus upon newly-public firms or adopt a sell-side perspective would be valuable in order to investigate organizational governance choices by, or for, entrepreneurial firms (e.g., Graebner and Eisenhardt, 2004) since much of this research on alliances and other arrangements grows out of the literature on the product- or geographic-market expansion patterns by diversified, multinational firms.

Apart from the avenues for research previously mentioned, the present study is also subject to a number of specific limitations that extensions could address. First, a number of generalizability issues deserve consideration. For example, we have focused exclusively on initial public offerings and have not considered equity carveouts, which involve the issuance of equity by divisions of established, public firms. Many of these carved-out units are acquired, spun off, or repurchased after going public (e.g., Vijh, 2002), so questions arise whether similar information spillovers and consequences exist for such deals or whether the data patterns for this phenomena are better explained by other considerations such as the operation of internal capital markets. It is also worth emphasizing that our study is limited to two-partner joint ventures and purely domestic deals, so extensions could examine whether the findings apply to other forms of alliances, collaborations involving more partners, or to cross-border deals. Given that our sample is comprised of US issuers only, it would also be worthwhile to examine the organizational governance choices involving newly-public firms in other countries.

Second, in drawing comparisons across joint ventures with acquisitions, our focus has been on full acquisitions, so there are sources of heterogeneity in acquisitions that might be examined in detail to investigate adverse selection in M&A and potential remedies other than joint ventures. For instance, while joint ventures are effective in directly reducing information asymmetries, firms can implement other alternatives in M&A to cope with the effects of asymmetric information by sharing overpayment risk with the bidder. Examples include using a partial acquisition, paying with stock rather than cash, or devising a contingent contract that ties payments to the target's *ex post* performance. Empirical applications of information economics often focus upon a single remedy to adverse selection rather than enumerating the full gamut of solutions, yet the challenge for decision-makers is precisely to choose among a set of remedies that may have different limitations or second-order consequences for firms.

Finally, we have sampled firms after they went public, and it would also be interesting to examine the organizational governance decisions involving private firms or to track such firms over time to investigate the sequencing of alliances, M&A, IPOs, etc. in a longitudinal fashion We believe that research in directions such as these might prove useful in understanding the role of IPOs in corporate strategy and the value of using concepts from information economics to complement our current understanding of the factors influencing the efficiency of alliances and other organizational arrangements.

REFERENCES

Akerlof, G. A. 1970. The market for 'lemons': Qualitative uncertainty and the market mechanism. ***Quarterly Journal of Economics***, 84: 488-500.

Ang, J. S., & Brau, J. C. 2003. Concealing and confounding adverse signals: Insider wealth-maximizing behavior in the IPO process. ***Journal of Financial Economics***, 67: 149-172.

Axelrod, R. 1984. ***The evolution of cooperation***. New York, NY: Basic Books.

Balakrishnan, S., & Koza, M. P. 1993. Information asymmetry, adverse selection, and joint ventures. ***Journal of Economic Behavior and Organization***, 20: 99-117.

Beatty, R. P., & Welch, I. 1996. Issuer expenses and legal liability in initial public offerings. ***Journal of Law and Economics***, 39: 545-602.

Beckman, C. M., & Haunschild, P. R. 2002. Network learning: The effects of partners' heterogeneity of experience on corporate acquisitions. ***Administrative Science Quarterly***, 47: 92-124.

Blowers, S. C., Griffith, P. H., & Milan, T. L. 1999. ***The Ernst and Young LLP guide to the IPO value journey***. New York, NY: John Wiley.

Brav, A., & Gompers, P. A. 1997. Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies. ***Journal of Finance***, 52: 1791-1821.

Capron, L., & Mitchell, W. 2005. When are alliances and acquisitions effective mechanisms for acquiring new resources? Unpublished working paper.

Carter, R., & Manaster, S. 1990. Initial public offerings and underwriter reputation. ***Journal of Finance***, 45: 1045-1067.

Certo, T. S., Daily, C. M., Cannella, A. A., Jr., & Dalton, D. R. 2003. Giving money to get money: How CEO stock options and CEO equity enhance IPO valuations. ***Academy of Management Journal***, 49: 643-653.

Chang, S. J. 1996. An evolutionary perspective on diversification and corporate restructuring: Entry, exit, and economic performance during 1981-89. ***Strategic Management Journal***, 17: 587-611.

Chemmanur, T., & Fulghieri, P. 1994. Investment bank reputation, information production, and financial intermediation. ***Journal of Finance***, 49: 57-79.

Chung, K., & Pruitt, S. 1994. A simple approximation of Tobin's q. ***Financial Management***, 23: 70-74.

Coff, R. W. 1999. How buyers cope with uncertainty when acquiring firms in knowledge-intensive industries: Caveat emptor. ***Organization Science***, 10: 144-161.

Datta, D. K. 1991. Organizational fit and acquisition performance: Effects of post-acquisition integration. ***Strategic Management Journal***, 12: 281-297.

Draho, J. 2004. ***The IPO decision: Why and how companies go public***. Cheltenham, UK: Edward Elgar.

Dyer, J. H., Kale, P., & Singh, H. 2004. When to ally and when to acquire. ***Harvard Business Review***, 82: 109-115.

Farjoun, M. 1994. Beyond industry boundaries: Human expertise, diversification and resource-related industry groups. ***Organization Science***, 5: 185-199.

Field, L. C., & Karpoff, J. M. 2002. Takeover defenses of IPO firms. ***Journal of Finance***, 57: 1857-1889.

Garmaise, M. J., & Moskowitz, T. J. 2004. Confronting information asymmetries: Evidence from real estate markets. ***Review of Financial Studies***, 17: 405-437.

Gatignon, H., & Anderson, E. 1988. The multinational corporation's degree of control over foreign subsidiaries: An empirical test of a transaction cost explanation. ***Journal of Law, Economics, and Organization***, 4: 305-336.

Gompers, P., & Lerner, J. 1999. ***The venture capital cycle***. Cambridge, MA: MIT Press.

Graebner, M. E., & Eisenhardt, K. M. 2004. The seller's side of the story: Acquisition as courtship and governance as syndicate in entrepreneurial firms. ***Administrative Science Quarterly***, 49: 366-403.

Gulati, R., & Higgins, M. C. 2003. Which ties matter when? The contingent effects of interorganizational partnerships on IPO success. ***Strategic Management Journal***, 24: 127-144.

Hellwig, M. F. 1980. On the aggregation of information in competitive markets. ***Journal of Economic Theory***, 22: 477-498.

Helwege, J., & Liang, N. 2004. Initial public offerings in hot and cold markets. ***Journal of Financial and Quantitative Analysis***, 39: 541-569.

Hennart, J.-F., & Reddy, S. 1997. The choice between mergers/acquisitions and joint ventures: The case of Japanese investors in the United States. ***Strategic Management Journal***, 18: 1-12.

Hibbard, J. 2004. How to drive suitors wild. ***BusinessWeek***, (August 2): 74.

Hurry, D., Miller, A. T., & Bowman, E. H. 1992. Calls on high-technology: Japanese exploration of venture capital investments in the United States. ***Strategic Management Journal***, 13: 85-101.

Ibbotson, R., Sindelar, J., & Ritter, J. 1994. The market's problem with the pricing of initial public offerings. ***Journal of Applied Corporate Finance***, 7: 66-74.

Jain, B. A., & Kini, O. 1995. Venture capitalist participation and the post-issue operating performance of IPO firms. ***Managerial and Decision Economics***, 16: 593-606.

Jenkinson, T., & Ljungqvist, A. 2001. ***Going public: The theory and evidence on how companies raise equity finance*** (2nd Edition). Oxford, UK: Oxford University Press.

Kogut, B. 1991. Joint ventures and the option to acquire and expand. ***Management Science***, 37: 19-33.

Koh, J., & Venkatraman, N. 1991. Joint venture formations and stock market reactions: An assessment of the information technology sector. ***Academy of Management Journal***, 34: 869-892.

Loughran, T., & Ritter, J. 2004. Why has underpricing changed over time? ***Financial Management***, 33: 5-37.

Lowry, M. 2002. Why does IPO volume fluctuate so much? ***Journal of Financial Economics***, 67: 3-40.

Megginson, W., & Weiss, K. 1991. Venture capitalist certification in initial public offerings. ***Journal of Finance***, 46: 879-903.

Michaely, R., & Shaw, W. H. 1994. The pricing of initial public offerings: Tests of adverse selection and signaling theories. ***Review of Financial Studies***, 7: 279-319.

Mikkelson, W. H., Partch, M. M., & Shah, K. 1997. Ownership and operating performance of companies that go public. ***Journal of Financial Economics***, 44: 281-307.

Milgrom, P., & Stokey, N. 1982. Information, trade and common knowledge. ***Journal of Economic Theory***, 26: 17-27.

Mitchell, W., & Singh, K. 1992. Incumbents' use of pre-entry alliances before expansion into new technical subfields of an industry. ***Journal of Economic Behavior and Organization***, 18: 347-372.

Montgomery, C. A., & Hariharan, S. 1991. Diversified expansion by large established firms. ***Journal of Economic Behavior and Organization***, 15: 71-89.

Mudambi, R., & Treichel, M. Z. 2005. Cash crisis in newly public Internet-based firms: An empirical analysis. ***Journal of Business Venturing***, 20: 543-571,

Oxley, J. E., 1997. Appropriability hazards and governance in strategic alliances: A transaction cost approach. ***Journal of Law, Economics, and Organization***, 13: 387-409.

Pagano, M., Panetta, F., & Zingales, L. 1998. Why do companies go public? An empirical analysis. ***Journal of Finance***, 53: 27-64.

Pennings, J. M., Barkema, H., & Douma, S. 1994. Organization learning and diversification. ***Academy of Management Journal***, 37: 608-640.

Pisano, G. P. 1989. Using equity participation to support exchange: Evidence from the biotechnology industry. ***Journal of Law, Economics, and Organization***, 5: 109-126.

Podolny, J. M. 1994. Market uncertainty and the social character of economic exchange. ***Administrative Science Quarterly***, 39: 458-483.

Pollock, T. 2004. The benefits and costs of underwriters' social capital in the US initial public offerings market. ***Strategic Organization***, 2: 357-388.

Ravenscraft, D. J., & Scherer, F. M. 1987. ***Mergers, sell-offs, and economic efficiency***. Washington, D.C.: Brookings Institution.

Reuer, J. J., & Koza, M. P. 2000. Asymmetric information and joint venture performance: Theory and evidence for domestic and international joint ventures. ***Strategic Management Journal***, 21: 81-88.

Riley, J. C. 2001. Silver signals: Twenty-five years of screening and signaling. ***Journal of Economic Literature***, 39: 432-478.

Ritter, J. R., & Welch, I. 2002. A review of IPO activity, pricing, and allocations. ***Journal of Finance***, 57: 1795-1828.

Spence, A. M. 1974. ***Market signaling: Informational transfer in hiring and related screening processes***. Cambridge, MA: Harvard University Press.

Stiglitz, J. E. 2000. The contributions of the economics of information to twentieth century economics. ***Quarterly Journal of Economics***, 115:1441-1478.

Stuart, T. E., & Sorenson, O. 2003. Liquidity events and the geographic distribution of entrepreneurial activity. ***Administrative Science Quarterly***, 48: 175-201.

Teece, D. J. 1992. Competition, cooperation, and innovation: Organizational arrangements for regimes of rapid technological progress. ***Journal of Economic Behavior and Organization***, 18: 1-25.

Tinic, S. 1988. Anatomy of initial public offerings of common stock. ***Journal of Finance***, 43: 789-822.

Vijh, A. 2002. The positive announcement period returns of equity carve-outs: Asymmetric information or divestiture gains. ***Journal of Business***, 75: 153-190.

Welch, I., 1989. Seasoned offerings, imitation costs, and the underpricing of initial public offerings. ***Journal of Finance***, 44: 421-449.

Williamson, O. E. 1991. Comparative economic organization: The analysis of discrete structural alternatives. ***Administrative Science Quarterly***, 36: 269-296.

Williamson, O. E. 2002. The theory of the firm as governance structure: From choice to contract. ***Journal of Economic Perspectives***, 16: 171-195.

TABLE 1
Descriptive Statistics and Correlation Matrix[a]

Variable	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Joint venture	0.16	0.36											
2. IPO clock (days)	855.23	430.96	-0.12*										
3. High-tech target	0.44	0.50	-0.13*	-0.11*									
4. IPO activity	567.88	171.47	0.10†	0.10	-0.06								
5. Acquisition experience	0.74	0.80	-0.24***	0.01	0.02	-0.04							
6. Alliance experience	1.22	1.31	-0.04	0.01	0.16**	-0.02	0.40***						
7. Target size	4.59	1.37	0.13*	0.13*	-0.04	-0.06	0.08	-0.06					
8. Target underpricing	0.32	0.61	-0.06	-0.10†	0.23***	-0.16**	0.16**	0.21***	0.12*				
9. Target Tobin's Q	3.27	5.25	0.08	-0.19***	0.21***	0.00	0.13*	0.27***	-0.03	0.34***			
10. Knowledge distance	0.36	0.35	0.29***	-0.03	-0.25***	0.03	0.06	-0.01	-0.01	-0.02	-0.00		
11. Investment bank reputation	7.79	1.71	-0.08	-0.03	0.13*	-0.07	0.12*	0.03	0.44***	0.18***	0.07	-0.07	
12. Venture capitalist backing	0.59	0.49	-0.19***	0.01	0.26***	-0.08	0.12*	0.28***	-0.17**	0.17**	0.18***	-0.05	0.21***

[a] N=345. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 2
Incidence of Joint Ventures and Acquisitions

	Full Sample (N=345)	Target Firm Size Quintiles (Total Assets $ mm.) (N=69 in each column) I ($0 – 33)	II ($33 – 65)	III ($65 – 130)	IV ($130 – 305)	V ($305 – 18,350)
Joint venture vs. acquisition (%)	15.65	17.39	11.59	10.14	13.04	26.09
Reputable investment bank (IB) (%)	75.94	44.93	73.91	76.81	92.75	91.30
Venture capitalist (VC) backing (%)	59.13	60.87	75.36	63.77	49.28	46.38
Joint venture (%) | reputable IB	14.50	16.13	7.84	5.66	14.06	26.98
Joint venture (%) | reputable IB absent	19.28	18.42	22.22	25.00	0	16.67
Joint venture (%) | VC backing	9.80	11.90	9.62	6.82	5.88	15.63
Joint venture (%) | VC backing absent	24.11	25.93	17.65	16.00	20.00	35.14

TABLE 3
Logit Estimation Results[b]

Independent Variables	≤ 5 yrs. I	≤ 5 yrs. II	≤ 4 yrs. III	≤ 4 yrs. IV	≤ 3 yrs. V	≤ 3 yrs. VI
Intercept	-1.97* (0.85)	-2.64* (1.07)	-2.21* (0.93)	-3.18** (1.18)	-2.84** (1.06)	-4.13** (1.34)
Sector fixed effects[c]	32.43***	36.01***	28.46***	31.75***	24.11***	29.20***
IPO clock	-0.00** (0.00)	-0.01** (0.00)	-0.00* (0.00)	-0.00† (0.00)	0.00 (0.00)	0.00 (0.00)
High-tech target	0.26 (0.59)	0.66 (0.64)	0.18 (0.59)	0.65 (0.65)	0.16 (0.62)	0.78 (0.70)
IPO activity	0.50* (0.21)	0.47* (0.22)	0.46* (0.22)	0.42† (0.23)	0.22 (0.21)	0.16 (0.23)
Acquisition experience	-2.24*** (0.44)	-2.58*** (0.50)	-2.01*** (0.43)	-2.30*** (0.50)	-2.41*** (0.51)	-2.84*** (0.61)
Alliance experience	0.21 (0.19)	0.41† (0.21)	0.14 (0.18)	0.28 (0.21)	0.37† (0.21)	0.54* (0.23)
Target size	0.65*** (0.17)	0.84*** (0.21)	0.55*** (0.16)	0.78*** (0.22)	0.35* (0.16)	0.67** (0.22)
Target underpricing	-0.42 (0.52)	-0.29 (0.52)	-0.31 (0.51)	-0.19 (0.51)	-0.12 (0.49)	0.04 (0.49)
Target Tobin's Q	0.12** (0.04)	0.14*** (0.04)	0.12** (0.04)	0.14*** (0.04)	0.12** (0.04)	0.14** (0.04)
Knowledge distance	1.48*** (0.27)	1.58*** (0.29)	1.41*** (0.28)	1.51*** (0.29)	1.37*** (0.29)	1.56*** (0.33)
Investment bank reputation		-0.50* (0.23)		-0.57* (0.24)		-0.72** (0.26)
Venture capitalist backing		-0.97* (0.48)		-0.86† (0.51)		-0.88† (0.53)
χ^2	124.58***	137.53***	106.23***	118.66***	90.34***	105.66***
$-2[L(\beta_{Reduced})-L(\beta_{Full})] \sim \chi^2$	---	12.94**	---	12.44**	---	15.31***
N	345	345	299	299	246	246

[b] Standard errors appear in parentheses. Positive coefficients indicate that higher values of a variable increase the likelihood of joint ventures over acquisitions. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[c] Likelihood ratio test statistics (χ^2) for the null hypothesis of equal sector effects.

TABLE 4
Interaction Effects of IPO and M&A Market Contingencies[d]

Independent Variables	I	II	III	IV	V
Intercept	-1.97* (0.85)	-2.64* (1.07)	-2.35* (1.04)	-2.17* (0.98)	-2.27* (1.02)
Sector fixed effects[e]	32.43***	36.01***	30.51***	33.13***	34.37***
IPO clock	-0.00** (0.00)	-0.01** (0.00)	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)
High-tech target	0.26 (0.59)	0.66 (0.64)	0.37 (0.61)	0.46 (0.61)	0.39 (0.63)
IPO activity	0.50* (0.21)	0.47* (0.22)	-0.16 (0.27)	0.30 (0.20)	-0.09 (0.28)
Acquisition experience	-2.24*** (0.44)	-2.58*** (0.50)	-2.47*** (0.48)	-2.59*** (0.48)	-2.67*** (0.49)
Alliance experience	0.21 (0.19)	0.41† (0.21)	0.31 (0.21)	0.42* (0.20)	0.46* (0.21)
Target size	0.65*** (0.17)	0.84*** (0.21)	0.73*** (0.20)	0.72*** (0.19)	0.75*** (0.20)
Target underpricing	-0.42 (0.52)	-0.29 (0.52)	-0.19 (0.51)	-0.48 (0.51)	-0.34 (0.50)
Target Tobin's Q	0.12** (0.04)	0.14*** (0.04)	0.15*** (0.04)	0.14*** (0.04)	0.14*** (0.04)
Knowledge distance	1.48*** (0.27)	1.58*** (0.29)	1.56*** (0.28)	1.87*** (0.39)	1.94*** (0.41)
Investment bank (IB) reputation		-0.50* (0.23)	-0.48* (0.23)	-0.53* (0.22)	-0.56* (0.23)
Venture capitalist (VC) backing		-0.97* (0.48)	-1.09* (0.47)	-0.38 (0.47)	-0.59 (0.50)
IB reputation * IPO activity			-0.10 (0.21)		-0.07 (0.22)
VC backing * IPO activity			1.07** (0.44)		0.92* (0.43)
IB reputation * Knowledge distance				0.10 (0.19)	0.10 (0.20)
VC backing * Knowledge distance				-1.01* (0.46)	-0.92† (0.49)
χ^2	124.58***	137.53***	137.21***	134.30***	140.50***
$-2[L(\beta_{II})-L(\beta_{Full})] \sim \chi^2$	---	---	6.34*	4.98†	8.87*

[d] N=345. Standard errors appear in parentheses. Positive coefficients indicate that higher values of a variable increase the likelihood of joint ventures over acquisitions. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[e] Likelihood ratio test statistics (χ^2) for the null hypothesis of equal sector effects.