THE STRUCTURING AND PERFORMANCE IMPLICATIONS OF
ENTREPRENEURIAL ACQUISITIONS

DISSERTATION

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ABSTRACT

Three essays investigate the importance of accounting for firms’ and transaction level characteristics in the study of M&A priors and outcomes. Chapters 2 and 3 bring together the entrepreneurship literature and the extant work on M&A to explain how the evolutionary patterns of acquirers can lead these firms to make different acquisition decisions, and experience different outcomes. Chapter 4 departs from the direct comparison of new and established acquirers, and focuses on the role of contingent earnouts as a contractual feature in M&A that can help bidders reduce the risk of overpaying for the firms they pursue.

In chapter 2, a sample of 409 acquisitions performed in the United States between the years 1992 and 2000 is considered. The results show that new ventures do not experience different mean M&A performance, but they face unique difficulties and opportunities in conducting acquisitions. For example, they are more likely to experience problems due to information asymmetry and adverse selection, partly due to their lower levels of M&A experience. Further, they appear to be better positioned to purchase firms with significant intangibles and growth prospects than established acquirers, likely because these targets represent better fits, which facilitates the cultural integration process following a deal.
Unlike the sample used in Chapter 2, which was a multi-industry study, Chapter 3 focuses on M&A transactions in the high-tech sector. Drawing from a sample of 445 deals occurred between 1992 and 2000, the evidence shows that equity markets tended to respond less favorably to the announcements of acquisitions by new ventures than they did to the announcements of acquisitions by established bidders. However, the former experienced better returns when they acquired private targets. Taken together, Chapters 2 and 3 demonstrate that M&A challenges shift in qualitative and systematic ways as firms evolve, and therefore that it is necessary to account for the differences between new and established firms in future M&A studies.

Chapter 4 draws from a sample of 2058 domestic M&A deals during the 1993-2000 timeframe. The question researched in this essay is whether contingent earnouts can act as contractual alternatives to governance remedies to the problems posed by asymmetric information in corporate acquisitions. The empirical evidence indicates that acquirers are more likely to rely upon earnouts to transfer risk efficiently to targets when purchasing private firms, new ventures, and targets situated in industries with dissimilar knowledge requirements. The results also show that earnouts and shared ownership can offer substitute remedies for adverse selection in corporate M&A.
Dedicated to my family and to my wife Isabel, whose presence and support have proven invaluable in completing this document and in inspiring me to be a better individual before a better academic.
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CHAPTER 1
INTRODUCTION

As a tool for corporate development, mergers and acquisitions (henceforth, M&A) have received much attention from theorists and empiricists in strategy. At the heart of the phenomenon lies the broader question of the boundaries of the firm, and when it is economically sensible to integrate production activities rather than disintegrate them. In turn, this question is of great importance to the development of strategic management, because as scholars in the field our goal is to explain the link between idiosyncratic firm characteristics and differences in performance outcomes. One of the ways firms can set themselves apart from competitors is by organizing their factors of production along the supply chain in unique ways, in order to obtain economies eventually yielding to rents.

In their ideal state, M&A provide a way for acquiring firms to combine their own resources with those of targets, in order to create a valuable, rare and hard-to-imitate set of capabilities leading to competitive advantage. However, the evidence on the value-creating potential of M&A remains mixed to date. While the above arguments suggest that if properly executed these transactions can in fact be beneficial for acquirers, there are a number of obstacles that can hinder the attainment of the synergies M&A are intended to generate. The study of these obstacles constitutes the bulk of the work on
mergers and acquisitions in finance and strategy, as developing an understanding of the
determinants of M&A outcomes can add a piece to the unsolved puzzle of the broader
question of the theory of firms’ boundaries.

1.1 Ex-Ante and Ex-Post M&A Problems

One of the theories most widely used in the finance literature to explain M&A
failure is Agency Theory. In its essence, agency theory states that economic agents – i.e.,
the managers - act as self-interested individuals and albeit their mandate is to act in the
best interest of the principal – i.e., the owner of the firm –, they may not do so unless the
latter’s interest coincides with their own (e.g., Jensen & Meckling, 1976; Fama, 1980;
Jensen, 1986). The problem is exacerbated by the existence of asymmetric information
between principals and agents, which makes it too costly for the former to consistently
and effectively monitor managers’ decisions. The finance literature has brought ample
evidence of value-destroying M&A activity imputable to agency theory (e.g., Amihud &
Lev, 1981; Roll, 1986; Stulz, 1988; Walkling & Long, 1988), showing that this problem
can lead to negative performance for acquirers due to suboptimal target selection,
valuation and deal structuring.

Another important theoretical framework that has offered explanatory power in the
study of M&A is Information Economics. The problem of bargaining under asymmetric
information has roots in Akerlof’s (1970) famous lemon’s example in the used
automobile market. If the prospective buyer cannot distinguish between high-value and
low-value vehicles, and the seller either cannot or does not want to reveal the true value
of the car, no exchange could ultimately take place. Similarly, in M&A if the risk of overpaying for the target assets is so high that its relationship with the expected return from the investment does not justify moving forward with the transaction, potentially profitable deals may not occur, while other, less attractive ones, may be completed (e.g., (e.g., Eckbo, Giammarino, & Heinkel, 1990; Fishman, 1989). Just as in Akerlof’s example the existence of warranties represented a partial remedy to asymmetric information, acquiring firms can implement coping strategies that will help them to reduce the overpayment risk by shifting it to the selling party. Chapter 4 deals precisely with this issue, discussing how contractual remedies such as contingent earnouts, or alternative governance solutions may be effective tools to avoid misevaluation.

Contingent earnouts (EO) are contracts whereby instead of paying for the target assets outright at the time of the acquisition, payments are deferred to a later time, contingent on the target ability to meet certain agreed upon performance goals (e.g., Kohers & Ang, 2000; Datar, Frankel, & Wolfson, 2001). While it is true that EO introduce other issues that must be accounted for by acquirers, such as the need to keep the target resources separate until the execution of the contract, it is also true that the incentive by target managers to misrepresent their value will be low. Therefore, in transactions in which the information asymmetry between the parties is bound to be greater, one would expect to observe a higher likelihood of using a contingent earnout for the acquisition. In chapter 4 I explore this question finding support for this hypothesis. Furthermore, I find that EO are preferred to stock payment as an alternative contingent payment strategy. Lastly, when investigating the relationship between EO as a
contractual solution to the problem of asymmetric information, and partial acquisitions as a governance remedy, my results bring evidence of the substitutive nature of the two. This result is important because it shows that by structuring M&A appropriately, acquirers may obtain the benefits of control without incurring some of the downsides of acquisitions. In other words, it may be possible to obtain contractually what previous literature had suggested could only be obtained by shifting governance choices with the tradeoffs thereof (e.g., Hennart, 1998).

Negative performance outcomes could also be the consequence of problems that could not be anticipated in the negotiation phases of an acquisitions and that arise after the deal has taken place. The process of integrating the target’s assets into the acquirer’s can be challenging, as it entails a twofold challenge. First, the physical and tangible resources of the seller must be efficiently incorporated into the buyer, in order to draw those benefits which make the acquisition attractive in the first place. This process can prove to be difficult, particularly if the target is an undivisionalized and relatively large firm, because the acquirer has to reconcile with and account for other undesired and unseparable assets through the course of integration (e.g., Hennart & Reddy, 1997). Chapter 2 brings evidence that the integration of large targets has a strongly negative effect on performance. The second aspect of integration that can impair M&A outcomes is that of cultural integration. The literature has shown that failure to account for the routines of target firms, or the imposition by acquirers of their own business models on the seller can severely hurt the chances of success of acquisitions (e.g., Buono & Bowditch, 1989; Datta, 1991; Haspeslagh & Jemison, 1991; Chatterjee, et al., 1992). For
example, in the case of acquisitions in the high-tech sector, Saikat and Behnam (1999) emphasize the importance of retaining key managers in the target firm as a necessary vehicle to maximize the likelihood of success in these transactions. One of the most important negative consequences of improper integration practices is precisely the departure of skilled workers on the sell-side of the deal (e.g., Schweiger & DeNisi, 1991; Cannella & Hambrick, 1993). Chapter 2 provides support for the notion that better M&A outcomes are experienced in deals in which acquirer and seller share similar characteristics and are therefore more likely to suffer less from integration difficulties.

The most important contribution of chapters 2 and 3 is that they bring together the existing work on M&A and the developing entrepreneurship literature. Specifically, both chapters account for the evolutionary pattern that firms follow in the early years of their existence, and then question whether the unique attributes characterizing new ventures can lead to different M&A outcomes for these firms. The following section discusses these two chapters in depth.

1.2 The Role of New Ventures in M&A

The literature in entrepreneurship studying the idiosyncratic aspects of new ventures has discussed several characteristics that set these firms apart from their established counterparts. These differences have not been considered in prior studies on M&A, whereas it is possible that they may affect the acquisition strategies of acquirers and targets alike. Chapters 2 and 3 research this question from the side of bidders. Specifically, they ask whether *ex-ante* and *ex-post* differences are present when new
ventures and established acquirers’ M&A performances are compared. Some of the most salient differences between these two classes of firms are to be found in new ventures’ higher risk propensity and competitive posture (e.g., Covin & Slevin, 1991; Chen & Hambrick, 1995; Stewart et al., 1998), as well as decision making biases such as responsiveness and generalization (e.g., Cooper, Dunkelberg & Woo, 1988; Smith et al., 1988; Mullins, 1996; Busenitz & Barney, 1997; Baron, 1998).

Chapters 2 and 3 bring evidence of the different outcomes experienced by new ventures vis-à-vis established acquirers. Chapter 2 uses a long-term, accounting performance measure such as industry-adjusted ROA, and it shows that while these two firms do not face significant differences in mean returns, they do respond differently to the challenges posed by information asymmetry and cultural integration. More precisely, new ventures suffer more from valuation hurdles, due to their cognitive biases and comparative lack of experiences with M&A. However, they appear to be better positioned than established acquirers to endure the cultural integration process, due to their informal communication channels and lower bureaucratization levels.

Chapter 3 uses a market-based measure of performance, by adopting the standard event-study methodology typically used in the literature. Furthermore, this chapter analyzes a sample of acquisitions of high-tech target firms, since these transactions have been dominant in the time-period considered, and startup activity in high-tech industries reached record levels during that time. The results of this analysis show that newly formed acquirers obtain lower mean cumulative abnormal returns than established bidders. However, when I explore the direct effects of these performance differences I
find that while new acquirers suffered more when they announced acquisitions of new targets, perhaps due the presence of the heuristics mentioned above, this category of buyers received better returns over the event window when they acquired privately-held targets. I attribute this result to the higher likelihood of successful integration anticipated by the markets, as well as to the lower search costs intrinsic in the acquisitions of privately-held targets.

In summary, the importance of the results lies in the fact that they emphasize the need to account for the differences between new ventures and established firms in future M&A studies. Given the extant literature that shows structural and behavioral separation between the two, and given the strong results presented here, it is possible that past work that failed to consider these difference may provide an incomplete picture of the M&A phenomenon.
A substantial body of literature has emphasized the different characteristics of new ventures and established firms and the many potential causes and implications of these differences. For example, some scholars have examined this broad issue through an economic lens, considering industry structural conditions such as concentration, capital intensity, and entry barriers (e.g., Acs & Audretsch, 1987, 1990). Other research has explored behavioral foundations such as risk-taking actions, competitive postures, and structural and cultural characteristics and how these features influence organizational survival (e.g., Covin & Slevin, 1991; Shane, 1994). In general, the literature has established that new ventures are apt to pursue competitive advantages in different ways than their established competitors, due in part to their different resources and strategies.

However, relatively little attention has been paid to the implications of these differences for new ventures’ emerging corporate strategies (c.f., Zahra, Ireland, & Hitt, 2000). Recent research has focused on the internationalization strategies of start-ups (e.g., McDougall, Shane, & Oviatt, 1994; McDougall & Oviatt, 1996; Zacharakis, 1997) and on alliances as components of new ventures’ broader corporate strategies (e.g,
Weaver & Dickson, 1998; Deeds & Hill, 1999). By comparison, however, little research effort has been devoted to M&A as a specific mode of expansion by these firms. This lack of research attention stands in contrast to the significant activity of new ventures in this realm in recent years and the important strategic choices new ventures must make when expanding through external growth in the face of resource constraints. Given the inherent differences between new ventures and established firms, it is plausible that new ventures might engage in M&A with different motives or transactional attributes. Likewise, new ventures might experience rather different performance outcomes compared with the established firms that have tended to be the focus of prior research. In broad terms, these sources of variance across new ventures and established firms provide interesting opportunities to explore the generalizability of previous M&A findings and also to probe the boundary conditions of theories applicable to mergers and acquisitions.

In this paper, we therefore wish to bring together the extensive literature on M&A activity (for a recent review, see Andrade, Mitchell, & Stafford, 2001) and prior research on the strategies pursued by new ventures. Specifically, we compare the performance implications of M&A as experienced by new ventures and established acquirers, and we focus in particular on two important sources of potential differences in acquisition performance: (1) valuation problems and the risk of adverse selection stemming from information asymmetries, (2) post-merger integration problems arising from structural integration challenges and cultural incompatibilities between acquirers and sellers with different characteristics. Thus, we seek to examine not only the potential differences in
acquisition performance for new ventures and established firms, but we also wish to investigate the specific sources of these differences in the M&A setting.

The remainder of the paper proceeds as follows: In the next section, we develop three hypotheses on how the drivers of M&A performance may differ for new ventures and established bidders. The following section offers details on the research design and is followed by a section containing the empirical findings. Based on a sample of over four hundred acquisitions, we find that M&A performance tends to be neither higher nor lower on average for entrepreneurial firms. Regarding the theoretical mechanisms underlying M&A performance, the findings suggest several interesting differences across these two types of acquirers. First, new ventures are more likely to experience performance penalties due to asymmetric information, and we show that this effect is partially due to their lack of experience relative to established acquirers. Second, structural integration problems are evident for both new ventures and established firms acquiring relatively large targets. Finally, one of the key advantages new ventures enjoy over established acquirers is their ability to purchase firms with significant intangibles and growth prospects since new ventures do not bring the bureaucratic structures and rigid decision-making procedures that more established bidders often impose on targets. The paper concludes with a discussion of some of the implications of this set of findings for research on corporate strategies by new ventures as well as for work in the M&A area in general.
2.2 Theory and Hypotheses

The number and dollar value of M&A deals have clearly seen a dramatic increase during the last decade or so (e.g., Andrade, Mitchell, & Stafford, 2001). For example, according to Mergerstat Review (2000), the total number of deals completed in 1999 was nearly five times the total number in 1990, and in dollar terms the value of M&A transactions was over thirteen times as great. Despite this impressive growth, there has been consistent evidence of widespread failure in mergers and acquisitions. Kaplan and Weisbach (1992) document that almost 44 percent of large acquisitions completed in the 1970s and early 1980s were subsequently divested, and a more recent BusinessWeek article suggests that 61 percent of buyers destroy their own shareholders’ wealth, with acquirers’ one-year equity returns averaging 25 percentage points less than their peers’ (Henry & Jespersen, 2002).

A substantial body of academic research has attempted to sort out these failures from more successful deals. This work has drawn on an impressive breadth of theoretical perspectives over the years. For instance, some articles relying on agency theory argue that the root cause of M&A failure can be found in misaligned incentives in the acquiring firm (e.g., Amihud & Lev, 1981; Jensen, 1986). Related research has suggested that hubris, or managerial overconfidence in the ability to extract value from acquisitions, can also lead to M&A failure (e.g., Roll, 1986). Other empirical research in finance and strategy draws upon many different explanations of acquisition performance, including market power effects (e.g., Eckbo, 1983), operational and financial synergies (e.g., Seth,
1990), experiential learning and cognitive biases (e.g., Halebian & Finkelstein, 1999), and so forth.

In this paper, we examine the acquisition performance of new ventures and established firms by focusing on the ex ante and ex post inefficiencies in M&A markets due to adverse selection and post-merger integration challenges, respectively. The risk of adverse selection arises from information asymmetries across bidders and targets and the resulting incentives for targets to misrepresent their value, making it difficult for bidders to screen targets efficiently. Ex post inefficiencies due to post-merger integration problems can arise when acquirers purchase relatively large targets or attempt to integrate targets with different resources and strategic objectives. Both perspectives emphasize transaction costs in M&A markets and have been the focus of recent research examining firms’ governance structure decisions, deal tactics, and acquisition performance. Below we develop the argument that, owing to the unique characteristics of new ventures and established firms (e.g., their risk-taking propensities, M&A experience levels, organizational cultures, etc), the consequences of adverse selection and post-merger integration challenges are likely to differ across these two sets of firms. It therefore can be problematic to either pool together these two types of acquirers in empirical studies or to generalize findings from samples of established acquirers to new ventures or vice-versa.
2.2.1 Adverse Selection

Since knowledge is often difficult to unbundle from other resources (Nonaka, 1994), acquisitions can represent a useful vehicle for gaining expertise and other resources that would be costly to replicate or assemble through other means (e.g., Kogut & Zander, 1992). However, the dissimilarities in acquirers’ and targets’ knowledge bases can also lead to serious problems arising from asymmetric information that can in turn partially explain the lower-than-expected acquisition performance for some deals.

The core prediction of information economics derives from an extension of the concepts of adverse selection and the market for lemons in product markets (Akerlof, 1970) to the M&A market. This theory suggests that when target firms have private information on their attributes and values, and they cannot credibly convey this value to acquirers in an efficient manner, the latter face the risk of purchasing a “lemon.” Moreover, the incentive for a target firm to misrepresent its value increases when the acquiring firm for its part cannot evaluate the target’s resources in a cost-effective way. These characteristics of the M&A market become manifest as the bidder and target firm have more and more disparate knowledge bases, and the result is an increase in the ex ante transaction costs of doing a particular deal as well as in the risk of selecting an inappropriate target.

Prior research in other fields has examined some of the effects of information asymmetry problems in M&A markets. For example, previous studies in finance have explored alternative ways of structuring M&A deals, and these tactics to reduce adverse selection problems themselves have shortcomings (e.g., Hansen, 1987; Fishman, 1989).
For instance, the acquirer could purchase the target with stock to shift a portion of the overpayment risk to the target, but this structure has the drawback of signaling to the equity market that the acquiring firm itself is overvalued. Recent research that has attempted to tie information asymmetry problems to M&A performance suggests that information asymmetry can lead to worse acquisition performance (e.g., Kohers & Ang, 2000).

The entrepreneurship literature has underscored some of the unique attributes of young firms, and these characteristics suggest that new ventures may face greater risks of adverse selection than their more established counterparts for several reasons. First, new ventures are more competitively aggressive and prone to take risks (e.g., Covin & Slevin, 1991; Chen & Hambrick, 1995; Stewart et. al, 1998). This suggests that such firms may be more eager to enter into deals subject to asymmetric information without appropriate deliberation or without developing sufficient remedies. Second, to the extent that new ventures are more likely to overestimate the attractiveness of opportunities (Cooper, Dunkelberg, & Woo, 1988) and their chances of success (Busenitz & Barney, 1997), they may be more apt to experience problems associated with asymmetric information and the risk of purchasing a lemon. As a third illustration, new ventures are likely to have less M&A experience than established firms. Some research in the M&A area suggests that experience, whether acquired directly or through a firm’s network of exchange partners (e.g., Beckman & Haunschild, 2002), may help improve acquisition performance along a number of dimensions (e.g., Vermeulen & Barkema, 2001). Not only are new ventures more likely to be less experienced, they are less apt to benefit from this experience since
they tend to make generalization errors and have similar cognitive biases as noted in many studies (e.g., Smith et al., 1988; Mullins, 1996; Baron, 1998).

**Hypothesis 1:** The greater the dissimilarity in bidders’ and targets’ knowledge bases, the worse new ventures will perform relative to established acquirers.

2.2.2 Post-Merger Integration

In addition to the ex ante transaction costs in M&A markets discussed above, the performance of an acquisition may also be negatively affected by ex post transaction costs stemming from the integration of the target’s assets. Research on these challenges has identified several deal attributes such as relative size, resource indivisibilities, and differences in corporate structure and management culture as some of the sources of post-merger integration (PMI) problems. For example, this body of work has suggested that post-merger integration costs are larger when the targets pursued by acquirers are relatively large (e.g., Hennart & Reddy, 1997) and when the corporate cultures and managerial styles of the acquiring firm and the target firm differ substantially (e.g., Datta, 1991; Chatterjee et al., 1992).

Although the respective arguments concerning how ex ante and ex post transaction costs arise from adverse selection and post-merger integration challenges are logically separable, in practice the sources of these two types of transaction costs tend to be highly related in M&A deals and tend to be difficult to disentangle empirically. For example, the attributes of target firms that make them costly to integrate (e.g., due to the embeddedness of desired resources) also tend to give rise to private information that is
difficult to convey in a credible fashion, so ex ante transaction costs for such targets will also tend to be higher. Moreover, while some of the ex post transaction costs observed in M&A deals will be due to unexpected events, problems, or changes in acquirers or targets during the implementation of structural integration, others might have been anticipated with more extensive due diligence. As a result, some PMI difficulties can also stem from problems due to information asymmetries, and firms can bear ex ante transaction costs to reduce ex post transaction costs in acquisitions.

Just as we expect new ventures to experience greater challenges than established firms in acquiring targets under conditions of asymmetric information, we expect new ventures to experience difficulties managing structural integration for several reasons. First, prior comparisons of these two classes of firms have noted that established firms generally have better administrative and supporting abilities, experience, financial means, and breadth of skills (e.g., Niederkofer, 1991). These administrative skills, experience, and slack resources may prove valuable when the acquirer seeks to bring the firms together and realize the intended synergies through structural integration.

Second, assessments of the potential synergies available through the M&A deal necessitate judgments by the acquiring firm regarding sources of latent synergies and potential integration obstacles. Paralleling the discussion in the development of our previous hypothesis, new ventures are less likely to exercise caution in such estimations due to their overconfidence and the generalization biases often exhibited in their decision-making processes (e.g., Busenitz & Barney, 1997). As a consequence, post-merger integration problems which might have been anticipated in the due diligence stage
of a deal will be more likely to be present in integration processes for new ventures’ acquisitions.

Third, the implementation of the structural integration of the two firms requires a well laid-out timetable built upon realistic objectives and rehearsed experiences (e.g., Mullins, 1996). However, new ventures may experience planning fallacies (Baron, 1998), or the propensity to underestimate the time required to complete a project and therefore set unrealistic goals. These three considerations as well as the tendency of new ventures to lack resources and experience and to be prone to cognitive biases suggests the following hypothesis:

**Hypothesis 2:** The greater the size of the target firm relative to the acquirer, the worse new ventures will perform relative to established acquirers.

Post-merger integration problems have not only been attributed to the difficulties surrounding the integration of firms of different sizes, but also to the challenges arising from the combination of organizations with different resources, management systems, cultures, and so forth. For example, a sizable stream of literature has supported the view that negative acquisition performance may stem from incompatibilities in management styles and reward systems (e.g., Buono & Bowditch, 1989; Haspeslagh & Jemison, 1991; Chatterjee, et al., 1992). When these differences become considerable between the transacting parties, the acquirer may fail to obtain sufficient cooperation from the target firm to effectively manage the integration process and achieve the basic goals of the acquisition (Datta, 1991).
Such integration problems tend to be particularly severe when acquirers impose their own management style on the target firm, and when acquirers seek to purchase a firm whose value is tied in large measure to intangible assets and growth opportunities. In these acquisitions, the negative impact of the imposition of the acquirer’s management systems and culture may be magnified because the target firm’s employees at once represent a considerable portion of the value of the deal, and they have to adjust their behaviors to new control and reward systems (e.g., Lorsch & Allen, 1973). Acquisitions of such firms may therefore disrupt the routines underlying the target firm’s capabilities that are being acquired in the first place (e.g., Nelson & Winter, 1982; Ranft, 1997) and lead to the departure of key managers (e.g., Schweiger & DeNisi, 1991; Cannella & Hambrick, 1993).

We suspect that these integration obstacles will be more prevalent for established firms acquiring targets with most of their values tied to intangible assets and growth opportunities. Such acquirers tend to have tested administrative blueprints and routines and may be less willing to accommodate the seller’s own practices and innovative activity (Hitt, Hoskisson, & Ireland, 1989; Hitt, Ireland, & Harrison, 1991). This behavior stands in contrast with research noting the need to create new communication channels in order to manage post-merger integration effectively (e.g., Ranft, 1997). Research also emphasizes that firms face significant difficulties learning from target firms rather than imposing their own cultures and resources on those firms (e.g., Haspeslagh & Jemison, 1991).
New ventures, by contrast, may be better suited for the acquisition of targets with significant intangible assets and growth opportunities. In these young acquirers, for example, many of the elements comprising the organization’s corporate culture may be in state of development and may therefore be more easily combined with the seller’s culture. Moreover, new ventures and targets with significant intangibles and growth opportunities will tend to share a number of similar characteristics. As one illustration, recent work in M&A has identified innovativeness, risk-taking propensities, decision making styles, and performance and reward orientations as dimensions of corporate culture (Chatterjee, et al., 1992). Some of these dimensions have also been used in descriptions of new ventures. For example, new ventures have been associated with a propensity to risk, growth ambitions, open communication channels, and loose informal control systems (e.g., Covin & Slevin, 1991; Chen & Hambrick, 1995; Stewart et. al, 1998). Taken together, these arguments suggest that new ventures may be better suited than established firms in acquiring firms with significant intangibles and growth opportunities.

**Hypothesis 3:** The greater the target firm’s intangibles and growth prospects, the better new ventures will perform relative to established acquirers.

### 2.3 Methods

#### 2.3.1 Model Specification

The basic structure of the multivariate statistical models is as follows:
(1) Acquisition Performance = \beta_0 + \beta_1 \text{ New Venture} + \beta_2 \text{ Knowledge Distance} + \beta_3 \text{ Relative Size} + \beta_4 \text{ Target Q} + \beta_5 \text{ Acquirer Size} + \beta_6 \text{ Acquirer Leverage} + \beta_7 \text{ Acquisition Experience} + \beta_8 \text{ Target Performance} + \beta \text{ Target Industry} + \text{Fixed Effects} + \epsilon.

While our focus centers on the relationship between the firm’s post-acquisition performance and the variables reflecting the level of information asymmetry and post-merger integration problems for new ventures and established firms, we implemented a number of controls to account for other potential firm- and industry-level drivers of acquisition performance. To address performance effects that may arise merely due to the size of the acquirer, we implemented a control for the firm’s asset size. Firm size has been found to have positive effects on performance, due to its relation to a firm’s market share, competitive position, and resources (e.g., Hansen, 1992; Van Dijk, Den Hertog, Menkveld & Thurik, 1997). However, other literature has brought evidence of some negative consequences associated with size, indicating that larger firms may exhibit higher degrees of institutional insulation and bureaucratization, which may in turn reduce their responsiveness to changing industry conditions (e.g., Haveman, 1993). We also controlled for the firm’s capital structure as it may influence its slack resources and motives to expand through acquisition (Jensen, 1986). We further included the bidder’s acquisition experience because experienced acquirers may choose better targets, structure their deals differently, or be in a better position to manage PMI processes through the development of routines (Nelson & Winter, 1982; Bruton, Oviatt & White, 1994; Vermeulen & Barkema, 2001). At the target level, we controlled for the performance of the acquired firm since prior work emphasizes that bidders more effectively implement
their own strategies and systems than learn from those of higher-performing targets (e.g., Haspeslagh & Jemison, 1991). As a further control of target influences on the focal firm’s performance, we introduced fixed effects for target firm industries. The operationalizations of all of these variables are set forth in the next subsection.

### 2.3.2 Measures and Data

**Acquisition Performance.** To compute the performance implications of an acquisition, we followed prior literature (e.g., Rhoades, 1994) and calculated an industry-adjusted measure of a firm’s change in return on assets (ROA), using the year preceding the deal and the third year following the acquisition. Specifically, the dependent variable was computed as follows:

\[
(2) \text{Acquisition Performance} = ( \text{ROA}_{i,t+3} - \text{ROA}_{i,t-1} ) - ( \text{ROA}_{\text{Ind},t+3} - \text{ROA}_{\text{Ind},t-1} ),
\]

where \( \text{ROA}_{i,t} \) represents the proportion of net income to total assets of firm \( i \) in year \( t \), and \( \text{ROA}_{\text{Ind},t} \) is the industry average return on assets in year \( t \) at the 2-digit SIC level.

**Explanatory Variables.** The proxy used to distinguish new ventures and established firms at the time of the acquisition was the firm’s age since its year of incorporation. Some debate exists concerning when a firm should be seen as a new venture, with cutoff values used as high as eight or twelve years (e.g., Covin, Slevin & Covin, 1990; Zahra, 1996). However, we sought to be more conservative and followed recent M&A work, which utilized a shorter, six-year cutoff (e.g., Zahra, Ireland & Hitt, 2000). When we used longer time horizons for the new venture status variable, similar results were obtained to those presented below. Data for this variable were obtained from
the Business & Company Resource Center, which is an integrated business resource administered by the Thomson Corporation Company outlining company profiles, histories and chronologies.

The next theoretical variable in the model is Knowledge Distance. The measure we adopted was first introduced by Farjoun (1994) and then utilized by other scholars in the M&A literature (e.g. Chang, 1996). This measure proxies the knowledge requirements of industries based on the distribution of employment across occupational categories. Specifically,

\[
(3) \text{Knowledge Distance} = \left[ \sum_{k=1}^{224} (E_{Ak} - E_{Tk})^2 \right]^{0.5}
\]

where \(E_{Ak}\) and \(E_{Tk}\) are the proportions of the workers in occupation \(k\) in the acquirer’s and the target’s industries, respectively. Data for the computation of this variable were derived from the Occupation Employment Survey, which provides the occupational distribution of US firms across over two hundred occupational categories within industries at the 3-digit SIC level. This survey is conducted annually by the Bureau of Labor Statistics.

Relative Size is the third theoretical variable in our model. This variable serves as a proxy for structural integration problems (Kuehn, 1975) since low values imply easier integration due to the relatively small size of targets, while higher values indicate the need to integrate two entities of more comparable size, with the corresponding challenges this process entails. The measure was calculated as the ratio of the target’s total assets to the acquirer’s total assets. Data for this measure were obtained from Compustat.
The last theoretical variable in our model is Target Q, which serves as a proxy for the target’s intangible assets and growth opportunities (Lang, Stulz & Walkling, 1989). The theoretical arguments above suggest that established firms will tend to experience greater difficulty integrating such firms than entrepreneurial bidders. Following Chung and Pruitt (1994), we approximated Tobin’s Q as the market-to-book ratio since this measure explains over 96 percent of the variance in a more sophisticated Tobin’s Q ratio that would require arbitrary assumptions about depreciation and inflation rates for the calculation of assets’ replacement values. The market value numerator is the year-end market value of common stock plus the book value of preferred stock and debt. The book value denominator is year-end total assets. Data for this measure were obtained from the Compustat data files.

**Control Variables.** Acquirer size was operationalized as the log of the acquirer’s total assets at the end of the year prior to the acquisition. The logarithmic transformation was used to remedy significant skewness for this variable. Acquirer leverage was computed as the ratio of the firm’s total liabilities to total assets, again at the end of the year before the transaction. The data to compute these two variables were obtained from the Compustat database. The third firm-level control is the acquirer’s experience with acquisitions, defined as the logarithm of one plus the number of transactions the firm carried out up to ten years preceding the focal transaction. We used the SDC database to assemble the acquiring firms’ deal histories to calculate this variable. Finally, we controlled for the performance of the target firm by including its return on assets (ROA).
at the end of the year prior to the acquisition. For this variable, data were collected from Compustat.

2.3.3 Sample.

The sample was drawn from the Security Data Corporation (SDC) database, and it includes all acquisitions of domestic firms by US bidders between the years 1992 and 2000. Since our dependent variable spans from one year prior to a deal to three years after, our final sample includes acquisitions occurring in the 1993-1997 timeframe. The number of deals consistently increased during this time interval, with 1997 providing about 33 percent of the observations in our sample, and 1993 a mere 7.5 percent. In order to assess the representativeness of our sample, we compared our data to the overall merger activity in the United States. After running a Pearson Chi-square test, we found that our figures were statistically comparable to the total volume of US M&A transactions ($\chi^2 = 0.14, \text{n.s.}$). From the acquirer’s side, the manufacturing (i.e., SIC 20-39) and finance, insurance and real estate (i.e., SIC 60-67) sectors accounted for almost 60 percent of the total number of deals – 30.8 and 27.9 percent, respectively – followed by services (i.e., SIC 70-89), with 18.8 percent of the total. The target firms followed a similar distribution, with the three broad sectors above accounting for 78.4 percent of the sample. An analysis of the relative asset size of the target to the acquirer revealed that in 80 percent of the deals the former was half the size of the latter or smaller, while in less than 13 percent of the transactions the target’s size was larger than the acquirer’s. While new ventures were smaller in size than established bidders (p<0.01), as would be expected, a two sample t-test indicated that there was no significant difference in relative
size across new ventures and established bidders (i.e., $t = 0.13$, n.s.). After accounting for missing accounting data from Compustat as well as missing data from other sources with which our data was merged, the final sample comprised 409 deals. Descriptive statistics appear in the results section below.

2.4 Results

Table 1 presents sample statistics and a correlation matrix. The average acquisition performance was close to zero during the 1993-1997 time frame, and about 5 percent of our sample was comprised of new ventures. The average firm had less than 2 acquisitions in the ten years prior to entering our sample, and this measured ranged from 0 (i.e., 13% of the sample) to 40 transactions. The mean debt-to-assets ratio was 0.62, while firm size averaged roughly $1.4 billion in assets.

The table reveals several noteworthy bivariate relationships among the variables. There is modest evidence that larger acquirers experienced better acquisition performance ($p<0.10$), a finding that might be partially attributable to the fact that larger firms tend to have more M&A experience and select better performing targets (both $p<0.001$). Experienced acquirers tend to pursue targets that are relatively smaller ($p<0.001$) and have fewer intangibles and growth prospects ($p<0.05$), perhaps because such acquirers tend to be larger and highly leveraged (both $p<0.001$). Finally, there is some evidence that targets with significant intangibles tend to be smaller relative to the bidder and farther from the acquirer’s knowledge base (both $p<0.10$).
In order to understand the effects of new venture status on the other explanatory variables in our model, we compared their mean values across new ventures and established firms. Two-sample t-tests revealed that there were no significant differences between the two classes of firms with respect to relative size (i.e., $t = 0.60$, n.s.), knowledge distance (i.e., $t = 0.28$, n.s.), target Q (i.e., $t = 1.23$, n.s.), target prior-year performance (i.e., $t = 1.19$, n.s.), and acquirer leverage (i.e., $t = 1.49$, $p<0.13$). However, there was evidence that acquisition experience differed between established and entrepreneurial firms ($p<0.05$), with established firms having more acquisition experience than entrepreneurial firms. For this reason, in a supplemental analysis presented below, we examine whether the differences across the theoretical mechanisms explaining M&A performance can be accounted for in part by new ventures’ more limited M&A experience.

The overall significant correlations among the explanatory variables indicate the importance of using multivariate methods to isolate the partial effects of the variables of interest on firm’s post acquisition performance, and they also raise the possibility of multicollinearity problems. To examine whether or not multicollinearity posed a problem for model estimation, we calculated variance inflation factors (VIFs), yet in no case did the VIFs exceed four, far short of the typical cutoff value of ten (Neter, Wasserman, & Kutner, 1985). However, in supplemental models appearing in Table 3, the maximum VIF reached 9.7, so variables were standardized prior to forming interaction terms, and this remedy reduced the maximum VIF to 2.6 (Cronbach, 1987).
Table 2 presents the results of the regression analyses for acquisition performance, with our explanatory variables interacted with the new venture status variable. Column I provides estimates for the control variables in the model, Column II shows estimates for the direct effects, and Column III offers the results for the full model including interaction terms, respectively. All three models in Table 2 are highly significant on an overall basis (p<0.001), and the improvements in model fit indicated by the hierarchical F-tests underscore the relevance of the theoretical variables and their differing functions across new ventures and established acquirers. There is little evidence, however, that new ventures per se do worse when conducting M&A.

Because prior literature has addressed how various ex-ante valuation and ex-post integration processes affect M&A performance, we sought to test whether the new venture status measure interacts with these theoretical variables in explaining M&A performance outcomes. While firms acquiring targets with different knowledge requirements do worse in general (i.e., p<0.001 in Column III), the interaction of new venture status and knowledge distance indicates that young firms in particular experience worse performance outcomes (p<0.01). This result is consistent with our first hypothesis on the hazards of adverse selection for new ventures and established acquirers. The large size of the parameter estimate on the interaction term indicates that new ventures are able to manage this problem as they become more established.

Hypothesis 2 suggested that the interaction effect between new venture status and relative size will be negative, but the negative parameter estimate in Table 2 did not reach statistical significance. Thus, no support was found for H2. The strong negative
relationship between the direct effect of relative size and acquirer performance indicates, therefore, that new ventures and established firms alike experience performance penalties from acquiring relatively large targets that are more difficult to integrate efficiently.

The last theoretical variable in our model is Target Q. Column II in Table 2 shows that acquisitions of firms with high growth opportunities lead to higher ex-post performance for acquirers. However, as Column III reveals, this result is driven entirely by the positive effects for new ventures (p<0.01). This interaction provides support for the hypothesis that younger firms may be more able to acquire a high-growth target since they are less likely to destroy its routines by imposing more bureaucratic structures and rigid decision-making processes.

Turning to our controls, we found that high levels of leverage positively affect performance (p<0.01), perhaps because highly-levered acquirers are less likely to carry out acquisitions for reasons tied to agency problems and are more likely to pursue synergy-yielding deals (i.e., Jensen, 1986; Lang, Stulz, & Walkling, 1991). Lastly, acquisition performance is negatively related to the performance of the target firm, which is consistent with prior arguments and findings emphasizing that acquirers face significant difficulties learning from target firms rather than imposing their own cultures and resources on them (e.g., Haspeslagh & Jemison, 1991). Paralleling prior work noting mixed results for experiential learning in the M&A setting (e.g., Haleblian & Finkelstein, 1999), we found no linkage between M&A experience and acquisition performance.

As noted above, one of the key differences between new ventures and established firms is that the later tend to have greater acquisition experience. In an effort to explore
whether the relative lack of M&A experience of new ventures accounts for some of our findings, we re-estimated the multivariate models using interaction terms with M&A experience rather than entrepreneurial status (see Table 3).

Column I presents the baseline specification prior to including the direct effects of the theoretical variables. In an effort to explore the appropriateness of pooling together different types of M&A experience for this analysis, we separated acquisition experience within the firm’s core business (i.e., at the two-digit SIC level) from prior deals outside of the firm’s primary business, but a hierarchical F-test indicated that the effects of these experiences were statistically equivalent (i.e., F=0.06, n.s.). Column II incorporates the theoretical variables, and Column III shows the results for the full model.

As discussed above, knowledge distance exhibits a negative effect on acquisition performance. However, its interaction with prior M&A experience suggests that learning effects not only can mitigate this outcome, but they can help the acquirer to turn this problem into an opportunity for higher performance (p<0.05). However, the multivariate results suggests that experience does not reduce the negative effects associated with purchasing relatively large targets (i.e., t = 0.19, n.s.), nor does it cause substantial changes in the positive performance implications of deals involving targets with high Tobin’s Q (i.e., t = 0.74, n.s.).

2.5 Discussion

Taken together, the empirical findings presented in this paper provide strong evidence for the need to distinguish new ventures and established firms in future M&A
studies. Although we see no differences in acquisition performance across new ventures and established firms in general, the findings indicates how the effects of the theoretical mechanisms we focus on differ in important respects across new ventures and established firms. The evidence presented in this paper therefore offers a parallel with work in many other areas emphasizing the implications of new ventures and established firms’ differing incentives and capabilities.

The results presented in this paper demonstrate that some of the M&A opportunities and challenges firms face tend to shift as the firm evolves, while other M&A challenges affecting performance tend to be more persistent as the firm develops. For instance, for start-up and young firms, the risk of adverse selection appears to be particularly salient, just as such firms are also uniquely situated to be able to purchase firms with more intangible assets and growth opportunities. By contrast, as a firm becomes more established and develops more bureaucratic decision-making processes, it is less able to acquire such targets, yet benefits from lower exposure to the risk of adverse selection. Our findings also highlight the persistent effects of structural integration problems for new ventures and established firms alike.

Although new ventures and established acquirers potentially differ in many respects that could be subject to further modeling in extensions to this study, we show that one of the important differences relates to their M&A experience levels. In subsequent multivariate models, we show that new ventures’ relative lack of acquisition experience can account for some of the results we obtain. Thus, we show that the effects of the theoretical variables differ across new ventures and established firms, and the difference
in new ventures and established firms’ M&A experience levels can be seen as one of the root causes of the findings. On a broader level regarding this observation, it is worth noting that prior research provides very mixed evidence on the benefits of M&A experience accumulation in general (e.g., Halebian & Finkelstein, 1999), yet we find that experience has very different implications depending upon the M&A challenge in question. Specifically, the accumulation of experience appears to be beneficial in reducing adverse selection problems, yet it also appears to be the case that such hazard mitigating capabilities do not extend to the ex post inefficiencies attending structural integration. Future research might explicitly identify other distinguishing features of new ventures and examine ways to pin down whether these features account for the significant interaction effects we find for the new venture status variable.

While this study demonstrates that new ventures and established firms experience different M&A challenges and performance outcomes due to their different resources and other characteristics, the study also has a number of limitations that extensions might address. On a conceptual level, we see several opportunities to expand upon the theoretical perspectives used in this study to examine M&A performance and compare new ventures and established acquirers. For instance, while our study has given attention to both ex ante and ex post transaction costs in M&A markets, it is also possible to examine other forms of transaction costs than we have considered. As one example, we have considered ex ante costs arising from information asymmetry, yet such costs also arise from the search processes in which firms engage prior to the deliberative aspects of deal-making that are the focus of our analysis. To the extent that established firms have
more elaborate networks due to their age as well as their geographic or product-market diversification (Rangan, 2000), such costs may be lower for larger firms, but new ventures’ unique network positions may also be useful in identifying acquisition candidates. Research could also revisit traditional theories in the M&A literature (e.g., agency theory, hubris, etc.) and determine if their key predictions vary across new ventures and established bidders.

Extensions might also explore several limitations that are evident in the empirical analysis. We have sampled publicly-traded targets due to the paucity of data for private firms, and this focus has the effect of reducing the information asymmetry problems across acquirers and targets. Just as this focus makes it harder to detect adverse selection problems since considerably less information is available on private targets, our reliance on available secondary data for acquiring firms may similarly reduce the differences between entrepreneurial and established firms and therefore makes for conservative tests of our predictions. Future studies might therefore collect primary data in order to examine private targets as well as explicitly measure firms’ integration processes.

Finally, we have focused on differences between new ventures and established firms on the buy side, and future research could also draw out important differences across new ventures and established firms on the sell side.

Despite the recent activity of new ventures in the M&A realm, little research currently exists on acquisitions by such firms (Zahra, Ireland, & Hitt, 2000). Future work on new ventures’ investment decisions might be conducted on standard corporate strategy topics such as vertical integration versus outsourcing across the value chain, the recent
rise of alliances and acquisitions, and so forth. From a theory building perspective, such research would be valuable in order to introduce new sources of variance in research designs to probe the boundary conditions of existing theories. Given the scope for research in directions such as these, the relevance of new ventures in M&A markets on both the buy and sell sides, and the currently limited stock of understanding on these phenomena, many interesting and fruitful avenues of research are present on acquisitions by and of new ventures.
### TABLE 2.1
**Descriptive Statistics and Correlation Matrix**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Acquisition performance</td>
<td>0.00</td>
<td>0.09</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. New venture</td>
<td>0.05</td>
<td>0.23</td>
<td>-0.04</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Acquirer size</td>
<td>3.17</td>
<td>0.93</td>
<td>0.09</td>
<td>-0.08</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Acquirer leverage</td>
<td>0.62</td>
<td>0.23</td>
<td>0.08</td>
<td>-0.07</td>
<td>0.60</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Acquisition experience</td>
<td>1.61</td>
<td>0.92</td>
<td>0.03</td>
<td>-0.09</td>
<td>0.42</td>
<td>0.23</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Target performance</td>
<td>0.00</td>
<td>0.15</td>
<td>-0.08</td>
<td>-0.09</td>
<td>0.21</td>
<td>0.16</td>
<td>0.16</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Knowledge distance</td>
<td>20.83</td>
<td>27.22</td>
<td>-0.11</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.08</td>
<td>0.03</td>
<td>0.05</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>8. Relative size</td>
<td>0.41</td>
<td>0.55</td>
<td>-0.26</td>
<td>-0.02</td>
<td>-0.45</td>
<td>-0.25</td>
<td>-0.22</td>
<td>-0.13</td>
<td>-0.03</td>
<td>---</td>
</tr>
<tr>
<td>9. Target Q</td>
<td>0.82</td>
<td>0.81</td>
<td>0.14</td>
<td>0.08</td>
<td>-0.08</td>
<td>-0.16</td>
<td>-0.10</td>
<td>0.07</td>
<td>0.08</td>
<td>-0.08</td>
</tr>
</tbody>
</table>

*N=409, † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.*
<table>
<thead>
<tr>
<th>Variable</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.09***</td>
<td>-0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>New venture</td>
<td>-0.02</td>
<td>-0.03†</td>
<td>-0.05</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Acquirer size</td>
<td>0.01</td>
<td>-0.00</td>
<td>-0.00</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Acquirer leverage</td>
<td>0.08**</td>
<td>0.08**</td>
<td>0.08**</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Acquisition experience</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Target performance</td>
<td>-0.08†</td>
<td>-0.09**</td>
<td>-0.08**</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Target industry fixed effects</td>
<td>2.53***</td>
<td>2.52***</td>
<td>2.55***</td>
</tr>
<tr>
<td>Knowledge distance (x10-2)</td>
<td>---</td>
<td>-0.06***</td>
<td>-0.04**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Relative size</td>
<td>---</td>
<td>-0.04***</td>
<td>-0.04***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Target Q</td>
<td>---</td>
<td>0.01*</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>New venture • Knowledge distance (x10-2)</td>
<td>---</td>
<td>---</td>
<td>-0.18**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.07)</td>
</tr>
<tr>
<td>New venture • Relative size</td>
<td>---</td>
<td>---</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.05)</td>
</tr>
<tr>
<td>New venture • Target Q</td>
<td>---</td>
<td>---</td>
<td>0.05**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.02)</td>
</tr>
<tr>
<td>Model F</td>
<td>2.44***</td>
<td>3.76***</td>
<td>3.89***</td>
</tr>
<tr>
<td>Δ F</td>
<td>---</td>
<td>14.13***</td>
<td>4.25**</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.16</td>
<td>0.24</td>
<td>0.27</td>
</tr>
</tbody>
</table>

**TABLE 2.2**

Multivariate Regression Results for Acquisition Performance\(^b\)

\(^b\) \(N=409\). Standard errors appear in parentheses. † \(p<0.10\), * \(p<0.05\), ** \(p<0.01\), *** \(p<0.001\).

\(^c\) Cell values represent the F-values of the test for joint significance of the fixed effects.
<table>
<thead>
<tr>
<th>Variable</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.08**</td>
<td>-0.05*</td>
<td>-0.05†</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>New venture</td>
<td>-0.02</td>
<td>-0.03</td>
<td>-0.03†</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Acquirer size</td>
<td>0.01</td>
<td>-0.00</td>
<td>-0.00</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Acquirer leverage</td>
<td>0.08**</td>
<td>0.08**</td>
<td>0.08**</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Acquisition experience</td>
<td>0.39</td>
<td>0.43</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>(0.48)</td>
<td>(0.46)</td>
<td>(0.50)</td>
</tr>
<tr>
<td>Target performance</td>
<td>-0.09**</td>
<td>-0.09**</td>
<td>-0.09**</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Target industry fixed effects</td>
<td>2.55***</td>
<td>2.54***</td>
<td>2.51***</td>
</tr>
<tr>
<td>Knowledge distance (x10⁻²)</td>
<td>---</td>
<td>-0.02***</td>
<td>-0.01**</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Relative size</td>
<td>---</td>
<td>-0.02***</td>
<td>-0.02***</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Target Q</td>
<td>---</td>
<td>0.01*</td>
<td>0.01*</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Acquisition experience (x10⁻²)</td>
<td>---</td>
<td>---</td>
<td>1.10†</td>
</tr>
<tr>
<td>Knowledge distance</td>
<td>---</td>
<td>---</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Acquisition experience (x10⁻²)</td>
<td>---</td>
<td>---</td>
<td>-0.12</td>
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<tr>
<td>Relative size</td>
<td>---</td>
<td>---</td>
<td>(0.62)</td>
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<tr>
<td>Acquisition experience (x10⁻²)</td>
<td>---</td>
<td>---</td>
<td>0.37</td>
</tr>
<tr>
<td>Target Q</td>
<td>---</td>
<td>---</td>
<td>(0.50)</td>
</tr>
<tr>
<td>Model F</td>
<td>2.46***</td>
<td>3.79***</td>
<td>3.66***</td>
</tr>
<tr>
<td></td>
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<td>14.18***</td>
<td>1.95</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.16</td>
<td>0.24</td>
<td>0.26</td>
</tr>
</tbody>
</table>

**TABLE 2.3**

Multivariate Regression Results for Acquisition Performance:
Effects of Acquisition Experience

N=409. Standard errors appear in parentheses. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

All variables appearing in interaction effects were standardized prior to forming the multiplicative term.

Cell values represent the F-values of the test for joint significance of the fixed effects.
CHAPTER 3
FIRM VALUATION EFFECTS OF HIGH-TECH M&A:
A COMPARISON OF NEW VENTURES AND ESTABLISHED ACQUIRERS

Mergerstat Review (2000) reports that during the 1990s, M&A deals have grown in number and in dollar terms by factors of five and thirteen, respectively. The sheer importance of this phenomenon in the economy of corporate development, as well as the several theoretical lenses from which mergers and acquisitions can be studied have given birth to a substantial amount of scholarly work in finance, economics and strategy. This body of literature has attempted to explain both the ex-ante drivers of M&A, as well as the ex-post outcomes that these transactions bring to acquiring firms. Overall, the evidence on the value-creating capabilities of acquisitions remains mixed, since the potential gains originating from scale and scope economies can be offset by the challenges stemming from the valuation and integration of target firms, as well as by the self-interested behavior of managers, who may seek personal gains that depart from those of the shareholders.

In this paper, we wish to explore the possibility that the unique characteristics of new ventures yield different M&A outcomes for these firms relative to established acquirers. There is a growing body of work that has delineated the key differences
existing between these two classes of firms. Yet, relatively little work has devoted its attention to the investigation of how these differences may play out in the area of mergers and acquisitions (e.g., Zahra, Ireland, & Hitt, 2000). It is important to integrate the entrepreneurship literature with the vast M&A work in finance and strategic management, for at least two reasons: First, doing so allows us to test the validity of entrepreneurship theory in an under-explored empirical context, which in turn provides fertile ground for the field to continue to develop. Second, this type of interdisciplinary work may offer further elements with which to explain the highly debated M&A phenomenon and the root causes of its widespread value-losing implications.

We study a sample of domestic acquisitions of high-technology sellers occurred during 1992-2000. We focus on high-tech industries because M&A activity in the technology sector contributed greatly to the overall growth of this corporate development tool in the time period we consider. For example, in 1998, there were as many as 5,000 such acquisitions in the United States alone, totaling half a trillion dollars (Saikat & Behnam, 1999). Also, since startup activity in high-tech industries was at record levels during the 1990s this sector provides the ideal ground for the study of new, entrepreneurial ventures engaged in M&A. Therefore, by restricting our dataset to high-technology acquisitions we obtain the threefold advantage of (1) not losing explanatory power due to hard-to-control-for industry-specific effects, (2) exploring a context in which the differences between new ventures and established acquirers are most likely to emerge, and (3) investigating a phenomenon of great economic importance.
The evidence shows that new ventures experienced worse average performance than established bidders. This result is imputed to a number of structural and behavioral biases found to be prevalent in young firms, such as higher risk propensity, less resource availability and developed routines, overconfidence and responsiveness, all of which can cause acquirers to be more exposed to the challenges posed by M&A. However, despite the lower mean cumulative abnormal returns experienced by new ventures, when we investigate some of the target-level characteristics in conjunction with the age of acquirers, we find that young bidders outperform established ones in transactions involving private targets. In these deals, new ventures are less exposed to the overpayment risk and their cultures and communication systems are more likely to be compatible with those of the seller. Lastly, our results provide evidence that newly incorporated bidders face worse outcomes from their acquisitions of young targets.

Whereas one might suspect that new acquirers and sellers would share similar organizational structures and routines, which may facilitate their integration process, we find that the inherent weaknesses of startup acquirers ultimately prevail in these deals.

The rest of the paper proceeds as follows: The next section provides some theoretical background on previous M&A studies and the entrepreneurship literature, as well as the development of our hypotheses. The following section discusses the models used in the analyses, as well as details on the construction of the measures and the sample selection. The paper concludes with the presentation of the results and remarks about their implications in the context of existing work and in future prospective.
3.2 Theory and Hypotheses

There is a substantial body of work in strategy and finance that has investigated how firm- and transaction-level characteristics can shape the outcomes of mergers and acquisitions for bidders. For example, although the pursuit of synergies remains the main driver of M&A activity (e.g., Seth, 1990), agency problems due to misalignment of interest between firms’ owners and managers can also affect acquisitions’ motives and performance (e.g., Amihud & Lev, 1981; Walkling & Long, 1984; Jensen, 1986; Stulz, 1988; Amihud, Lev & Travlos, 1990). Related empirical work has linked acquisition outcomes to managerial hubris, or the exaggerated conviction by bidding firms’ managers that they can extract value from an acquisition (e.g., Roll, 1986; Seth, Song & Pettit, 2000). Other determinants of M&A outcomes have been noted to be related to market power effects (e.g., Eckbo, 1983), experiential learning and cognitive biases (e.g., Haleblian & Finkelstein, 1999), valuation issues related to information asymmetry between acquirers and sellers (e.g., Hansen, 1987; Fishman, 1989), and integration challenges ex-post a deal (e.g., Datta, 1991; Chatterjee et al., 1992).

Despite the considerable amount of work broadly outlined above, comparatively little attention has been given to the evolutionary pattern that acquirers and targets undergo in the early years of their existence, and how this transitory stage can affect their performance in M&A. This apparent omission stands in sharp contrast with the advancements that the entrepreneurship literature has made in explaining the idiosyncratic features of new ventures that set this category of firms apart from their established counterparts. Specifically, since some of these features appear likely to
influence firms’ M&A priors and outcomes, it is possible that studies not considering the
differences between startups and established firms provide a partial or incomplete
depiction of the M&A phenomenon. For instance, some work has indicated that new
ventures hold a higher propensity to take risks and are more aggressive in their
investment decisions than their complements (e.g., Covin & Slevin, 1991; Chen &
Hambrick, 1995; Stewart et. al, 1998). These findings suggest that new ventures may be
(1) more willing to take on acquisitions in which information asymmetry between the
parties can increase the risk of inaccurate valuation of the target’s resources (e.g.,
Hansen, 1987; Fishman, 1989); and (2) less keen to set up appropriate coping strategies
required by information-related hazards, such as the use of contingent earnouts and
staged investments (e.g., Kohers & Ang, 2000; Datar, Frankel, & Wolfson, 2001).

These problems are further exacerbated by the previously noted lack of reliability
and accountability in the organizational routines of new ventures (Hannan & Freeman,
1989). Moreover, given their short-lived existence, startup firms likely hold less
experience with acquisitions than established bidders. To the extent that prior M&A
experience can help acquirers avoid arrant mistakes in the key stages of a deal (e.g.,
Vermeulen & Barkema, 2001), young bidders may operate at a disadvantage vis-à-vis
established ones. Also, holding equal experience levels, new ventures have been found to
fall in generalization errors that hinder their ability to gain from prior experiences (e.g.,
Smith et. al, 1988; Mullins, 1996; Baron, 1998). Lastly, entrepreneurial firms exhibit
behavioral biases that are likely to skew their decision-making ability during acquisitions.
For example, these firms have been found to overestimate the attractiveness of
opportunities (Cooper, Dunkelberg & Woo, 1988) and their chances for success in future investments (Busenitz & Barney, 1997). These tendencies can lead to the erroneous identification and valuation of targets, and cause bidders to underestimate their expected ability to carry out effective integration practices, which have been noted to be directly related to M&A outcomes in prior studies (e.g., Buono & Bowditch, 1989; Datta, 1991; Haspeslagh & Jemison, 1991; Chatterjee et al., 1992).

The arguments developed above suggest that new ventures may be more exposed to the challenges of the early stages of M&A and therefore lead us to our first hypothesis:

**Hypothesis 1:** Newly incorporated acquirers will experience lower average cumulative abnormal returns than established acquirers.

### 3.2.1 Acquisitions of Private Targets

While the above arguments and hypothesis suggest that new ventures may be worse-positioned to engage in M&A activities than established bidders in general, we wish to explore the determinants of the performance differences between these two classes of firms further. Specifically, we are interested in determining how the new venture status of bidders affects the outcome of acquisitions of targets with characteristics that have been noted to shift hazards for M&A bidders.

The first target-level feature we consider is whether the firm is a private or a public entity. Previous literature has emphasized the different set of challenges and opportunities inherent in the acquisitions of privately-held and publicly-traded targets (e.g., Ellingsen & Rydqvist, 1997; Chang, 1998; Pagano, Panetta & Zingales, 1998). First, the reporting requirements of companies listed on equity markets, along with the collective judgment
of investors can help buyers adjust their bids and reduce the overpayment risk due to asymmetric information (e.g., Hellwig, 1980; Holmstrom & Tirole, 1993; Ellingsen & Rydqvist, 1997). Second, aside from the direct information-related advantages associated with being public, by going through the IPO process targets indirectly signal their value to potential acquirers by bearing the significant fees linked to registration and underwriting (Ritter, 1987) as well as the indirect costs of under-pricing (Allen & Faulhaber, 1989). Third, sellers that have undergone an initial public offering can benefit from the reputation of investment banks, which refrain from misrepresentations owing to their repeat business (Beatty & Ritter, 1986).

The above arguments suggest that the valuation of privately-held prospects involve greater uncertainty for all acquirers. However, the question we wish to address is whether the M&A outcomes experienced by new ventures and established bidders differ when they acquire private targets. In our previous hypothesis we discussed some of the hazards faced by new ventures during acquisitions, focusing specifically on their propensity to overestimate the value of investment opportunities and therefore overvalue targets. Based on this logic, we would expect that new ventures would experience lower mean returns than established acquirers in acquisitions of private firms, because these challenges would likely be amplified by the greater severity of the information asymmetry problem present in these deals.

However, it is also possible that new bidders may be better positioned to gain from the acquisition of private firms for a number of reasons. First, the degree of “fit”, or corporate culture compatibility may be greater for these acquirers than for established
firms, because the latter might have developed rigidities over time that could hinder the integration of the target resources, while the former have more open communication channels and loose control systems (e.g., Covin & Slevin, 1991; Chen & Hambrick, 1995). It is a well-documented fact in the literature that the imposition of unfamiliar routines and managerial styles by acquiring firms could disrupt the capabilities of targets, and lead to the departure of key personnel (e.g., Schweiger & DeNisi, 1991; Cannella & Hambrick, 1993). As noted by Saikat & Behnam (1999), in order to benefit from high-tech M&A, it is essential for bidders to retain skilled workers in the aftermath of a deal. Privately-held firms often rely on less rigid control systems and bureaucratic organizations, as they are typically smaller and they likely require less complexity in the coordination of their business activities. These arguments suggest that newly incorporated acquirers will have better integration potential than established ones in the acquisition of privately-held sellers.

Another rationale to support the proposition that startups may experience better M&A outcomes in acquisitions of privately-held firms follows from the Limited Competition Hypothesis, discussed by Chang (1998). In Chang’s argument, purchases of private targets typically involve less competition from other potential bidders than deals involving publicly-traded firms, due to the high costs involved in the search and valuation of privately-held sellers. Given their propensity to overvalue prospective targets, new ventures may be less exposed to overbidding when competition is reduced or absent, than when multiple potential buyers compete for the same firm, as the threat of falling in the winner’s curse becomes more and more pronounced in these settings (e.g., Capen, Clapp
Furthermore, established ventures are comparatively less resource-constrained and they may proceed with acquisitions of private firms that may perhaps require further scrutiny. For example, Jensen (1986) discusses the tendency by firms with large availability of free cash flows to engage in M&A without using necessary caution or implementing opportune coping strategies to overcome the risks intrinsic in their investments. In contrast, firms with less slack must be more careful in their discretionary decisions, as capital rationing may cause them to forgo one investment if they choose to move forth with another. This set of considerations suggests that new ventures may experience better returns from acquisitions of private targets than their established counterparts. Therefore, we state:

**Hypothesis 2:** Newly incorporated acquirers will experience higher average cumulative abnormal returns than established acquirers when the target is privately-held than when the target is publicly traded.

### 3.2.2 Acquisitions of Newly Incorporated Targets

In the previous section we have discussed the first target-level characteristic that is likely to result in performance differences between new and established acquirers. Our next hypothesis explores the possibility that when young firms acquire like targets, they will experience different returns from when the seller is an established entity. Just as the unique features of new ventures can affect the acquiring side of the transaction and shape the deal outcome, these attributes can also affect the performance of an acquisition when they are present in the target firm.
New ventures may be better suited for the acquisition of young targets because the transacting parties will be likely to share similar cultural and structural characteristics. The question of compatibility between acquirers and targets in M&A has been largely investigated in the literature, and the consensus is that negative performance will emerge from incongruence in management styles and reward systems (e.g., Buono & Bowditch, 1989; Datta, 1991; Haspeslagh & Jemison, 1991; Chatterjee, et al., 1992). This type of integration problems tends to be more pronounced if acquirers attempt to impose their own management style on the target firm, and if the value of the seller is tied mostly to intangible assets and human capital, as is often the case in acquisitions of high-technology targets. As previously mentioned, it is crucial for acquirers to focus on the retention of key managers, in order to maximize the chances of success of a high-tech deal, as failure to do so may jeopardize the target firm’s capabilities (e.g., Nelson & Winter, 1982; Ranft, 1997) and cause skilled workers to resign (e.g., Schweiger & DeNisi, 1991; Cannella & Hambrick, 1993). To illustrate this point, Saikat and Behnam (1999) discuss the case of the acquisition of Rolm by IBM in 1984. After only four years of mediocre performance, during which IBM repeatedly forced its business model on Rolm, the company was sold off to Siemens.

Firms that have existed for six years or less are still in their developmental stages, and they do not have fully formed identities, routines, cultures and managerial styles. Rather, they are continuously adjusting their business model as their competitive position becomes defined over time. Moreover, new ventures will likely have more open communication channels and loose informal control systems than established ones (e.g.,
Covin & Slevin, 1991; Chen & Hambrick, 1995; Stewart et. al, 1998), which will facilitate integration between buyers and sellers after the deal in consummated. On the other hand, as we discussed in the development of our previous hypothesis, established firms might exhibit tighter bureaucratic systems which could inhibit the extraction of synergies from the deal (e.g., Schweiger & DeNisi, 1991; Cannella & Hambrick, 1993).

While the above arguments indicate that new ventures will perform better than established acquirers when the transaction target is itself a newly incorporated firm, in our first hypothesis we have also emphasized that startup acquirers will be more exposed to the ex-ante challenges of M&A. For example, based on the existing entrepreneurship literature, such behavioral biases as overconfidence and responsiveness will cause new ventures to overestimate the attractiveness of opportunities, be less prone to set up risk-sharing strategies with sellers, and ultimately value targets more than they are worth. These valuation problems may be more severe if the target is itself a young firm, because less historical and codified information is available on newly-incorporated targets, and the little existing information may be hard to interpret and infer from, as new ventures often have organizational routines and performance record that are not reliable and lack accountability (Hannan & Freeman, 1989). These sets of arguments create a tension in our prediction, as it is unclear which considerations might prevail in the determination of the acquisition outcome. Thus, we make two opposing hypotheses, as follows:

**Hypothesis 3a:** Newly incorporated acquirers will experience higher average cumulative abnormal returns than established acquirers when the target is a newly incorporated firm than when the target is established.
Hypothesis 3b: Newly incorporated acquirers will experience lower average cumulative abnormal returns than established acquirers when the target is a newly incorporated firm than when the target is established.

3.3 Methods

3.3.1 Model Specification

The basic structure of the multivariate statistical models is as follows:

(1) Acquisition Performance = \( \beta_0 + \beta_1 \text{ New Venture Bidder} + \beta_2 \text{ New Venture Target} + \beta_3 \text{ Private Target} + \beta_4 \text{ Acquisition Experience} + \beta_5 \text{ Acquirer Leverage} + \beta_6 \text{ Acquirer Size} + \beta_7 \text{ Market Relatedness} + \beta_8 \text{ Stock Consideration} + \varepsilon. \)

While our goal was to understand how the characteristics typically associated with new ventures can lead acquirers to experience different M&A outcomes, vis-à-vis established bidders, we also introduced a number of controls to account for other firm- and industry-level factors that may affect the performance of acquirers. We included the bidder's prior acquisition experience, as there is evidence in the literature that routines developed through experience can help acquirers to better identify, value, and integrate targets (e.g., Nelson & Winter, 1982; Bruton, Oviatt & White, 1994; Vermeulen & Barkema, 2001). We also controlled for the bidding firms’ capital structure, because leverage may influence slack resources and motives to expand through acquisitions (Jensen, 1986). Further, we included a control for the acquirer's size, in order to consider positive performance effects due to bidders' resourcefulness and market power (e.g., Delacroix & Swaminathan, 1991; Hansen, 1992; Van Dijk, Den Hertog, Menkveld & Thurik, 1997), as well as negative ones owed to large firms' higher degrees of
institutional insulation and bureaucratization, which may hinder their ability to respond effectively to changing market conditions (e.g., Haveman, 1993). Our next control is Market Relatedness. Recent work has shown that market responses to acquisition announcements vary based on the degree of similarity between acquiring and target firms’ industries. For example, Morck, Shleifer and Vishny (1990) report that related transactions are likely to yield higher gains for shareholders. However, Matsusaka (1993) contradicts this finding, attributing his results to differences in economic and regulatory cycles that affect market reactions to related M&A over time. The last control in our model is an indicator of whether the acquisition was paid entirely in stock. We included this variable because prior work in finance shows that stock-only transactions yield average negative abnormal returns for bidders, as they signal overvaluation of the acquiring firm's equity (e.g., Myers & Majluf, 1984; Hansen, 1987; Travlos, 1987). The operationalizations of all of these variables are set forth in the next subsection.

### 3.3.2 Measures and Data

**Acquisition Performance.** Our measure of acquirers' performance is obtained through the use of the standard event study methodology (i.e., Brown & Warner, 1985). In order to estimate the parameters of the market model, we regressed each firm's daily returns on the market returns during the period spanning from 205 to 6 days prior to the acquisition. We then used these parameters for the longitudinal computation of the cumulative abnormal returns (henceforth, CARs) during the event window, which goes from one day before to one day after the deal.
Explanatory Variables. In order to distinguish between new and established acquirers and targets, we used the firm's age since its incorporation. We sought to be very conservative in the operationalization of this construct, and applied a six-year cutoff, consistent with recent work in the M&A area (e.g., Zahra, Ireland & Hitt, 2000). It is worth noting that other scholars have adopted longer time horizons (e.g., Covin, Slevin & Covin, 1990; Zahra, 1996) and that we obtained similar results when we extended the threshold to eight or twelve years. Data on the year of incorporation of the firms in our sample were obtained through detailed review of articles and company reports available on the Lexis Nexis database, as well as on the Business & Company Resource Center, which is an integrated resource administered by the Thomson Corporation Company outlining company profiles, histories and chronologies. We also included the target public status, assigning values of one to privately-owned sellers, and zero to publicly-held ones. Data for this variable were collected from the SDC database.

Control Variables. We calculated acquirer’s M&A experience with acquisitions as the logarithm of one plus the number of transactions the firm carried out up to five years preceding the focal transaction. We used the M&A module of the SDC database to assemble the acquiring firms’ deal histories and calculate this variable. Acquirer leverage was computed as the ratio of the firm’s total liabilities to total assets at the end of the year before the transaction being considered. Acquirer size was computed as the log of the acquirer’s total assets at the end of the year prior to the acquisition. The logarithmic transformation was used to remedy significant skewness for this variable. The data to compute acquirer's leverage and size were collected from the Compustat database.
Market relatedness was operationalized as a dummy indicator assuming value of one if the two-digit SIC codes of the acquirer and the target matched, and zero otherwise. Lastly, we assigned a value of one to the Stock consideration variable if the payment for the acquisition was done entirely in stock, and zero if any other means of payment was used. The data to compute the Market relatedness and Stock consideration variables were assembled from the SDC database.

**Sample.** The sample of M&A transactions used in this paper was drawn from the Security Data Corporation (SDC) database, and it includes all domestic acquisitions of high-technology firms by US bidders between the years 1992 and 2000. In an effort to be comprehensive in the classification of our sample, we used AeA’ industry definitions to identify the 45 SIC codes making up the high-tech sector. AeA is the nation’s largest high-tech trade association and it represents over 3,000 companies ranging from software, semiconductors, medical devices, computers, internet technology, advanced electronics, and telecommunications systems and services. It should be noted that industries are only included in the AeA classification if the high-tech portion of their activities clearly constitutes the majority of their business. Also, since, according to AeA, “current U.S. government statistics do not allow clearly to identify which portion is bio and which is tech", the biotechnology industry was not included. Table 1 presents a breakdown of the SIC codes listed by AeA and the number of transactions in our sample for each individual sector.

Consistently with the overall M&A activity in the US during the 1990s, we observed a steady increase in the number of deals over time, with the first two years in
our sample accounting for just over five percent of the sample, and the last two years amounting to nearly forty percent of the total. We ran a Pearson Chi-square test to determine whether this longitudinal trend differed between new ventures and established acquirers, but we found no evidence supporting this hypothesis ($\chi^2 = 7.23, df=8, \text{n.s.}$).

However, an analysis of the distribution of the deals based on the target 2-digit SIC codes reveals that while established acquirers sought targets in the manufacturing (i.e., 36.63% of the total), services (i.e., 57.30%) and communications (i.e., 6.06%) industries alike, the overwhelming majority of acquisitions by new ventures were of targets operating in the service sectors (i.e., 84.15% of the total). A formal test confirmed the dissimilarities across these two categories of firms ($\chi^2 = 24.82, df=4, p<0.001$).

After accounting for missing accounting data from Compustat as well as missing data from other sources with which our data was merged, the final sample comprised 445 deals. Descriptive statistics appear in the results section below.

### 3.4 Results

Table 2 presents the results of the event study for the full sample, as well as for the sub-samples comprised only of new ventures and established acquirers, respectively. The table also includes a T-test to check whether the results differed between these two categories of firms. While the time window we consider goes from one day prior to one day after the deal’s announcement, for thoroughness of exposition we include abnormal returns for a total of 11 days surrounding the event date. Not surprisingly, inspection of the full sample results reveals that significance in the excess returns is greatest on the
very day of the announcement (i.e., p<0.001), as well as on the days immediately preceding and following it (i.e., p<0.1). Established acquirers showed greater average positive abnormal returns than new ventures, although cumulatively these differences did not reach statistical significance either for the three-day event window we use in the subsequent multivariate analysis, or for the longer five-day window which we also report in the table (i.e., t=0.64 and t=0.83, respectively).

Table 3 presents descriptive statistics for the samples comprised of new ventures and established acquirers, along with the appropriate tests to gauge whether there were noteworthy statistical differences between these two categories of bidders. As expected, established acquirers were on average significantly larger than new ventures (i.e., t=-3.81, p<0.001), and they held greater levels of prior acquisition experience (i.e., t=-4.41, p<0.001). However, they did not have unlike capital structures (i.e., t=-0.74, n.s.). Interestingly, newly incorporated bidders sought targets in related industries much more than established acquirers (i.e., \( \chi^2 = 11.92, p<0.001 \)), perhaps indicating a more focused expansion strategy by the former. Alternatively, this result may simply be a direct consequence of the size differences discussed above, which may offer an a priori broader target spectrum for established acquirers. Further, we found that stock was chosen as a means of payment more frequently by new ventures than established acquirers (i.e., \( \chi^2 = 16.59, p<0.001 \)). This result could be explained by the comparatively more limited access to outside financing and internal capital markets of new ventures. Another plausible explanation is consistent with the finding that the higher the acquirers’ growth opportunities, the more likely the payment is to be made in stock (i.e., Martin, 1996).
While we do not have a direct measure of acquirers’ growth opportunities, it is likely that young bidders engaging in M&A activity in the first six years of their existence held greater average growth opportunities than more seasoned acquirers. We did not find any evidence supporting the notion that new ventures sought private targets more than established acquirers (i.e., $\chi^2 = 1.31$, n.s.). This descriptive result is hardly surprising, as it would be difficult to imagine that any acquirer would have an arbitrary preference for targets based on their public status, rather than their idiosyncratic resources and capabilities. Lastly, we found that new ventures pursued newly incorporated targets more than established bidders did (i.e., $\chi^2 = 11.91$, $p<0.001$). As discussed in our third hypothesis, this finding may be attributed to the natural selection process that leads new acquirers to pursue like target firms, because their similar characteristics could facilitate the integration process and the exploitation of the synergies intended by the transaction.

Table 4 presents descriptive statistics and a correlation matrix for the entire sample. The mean CAR was just over two percent and about 18 percent of the acquirers were new ventures. The average firm had roughly one acquisition in the five years preceding the focal transaction, and was about $2.2$ billion in total assets size. As noted, there is a substantial difference in size between new acquirers and established ones, as the former had average total assets of $461$ million, while the latter averaged about $2.7$ billion. There is evidence that larger acquirers with high M&A activity in the recent past faced worse CARs (all $p<0.001$). Combined with the fact that large, established acquirers sought targets in diversified industries, these descriptive results are consistent with finance theory, imputing unfocused and excessive M&A activity to free-cash flow.
availability, empire building and the principal-agent problem (e.g., Jensen, 1986).

Finally, we found a strong positive correlation between average CARs and the target private status (i.e., p<0.001). This result is consistent with our second hypothesis and with prior work (e.g., Chang, 1998), and will be discussed at length in the following section, which presents our multivariate results.

Table 5 presents the results of the regression analyses for the acquirers’ CARs. Model I provides estimates for the control variables in the model, Model II shows estimates for the direct effects, and Model III offers the results for the full model including interaction terms, respectively. All three models in the table are highly significant on an overall basis (p<0.001), and the improvements in model fit demonstrated by the hierarchical F-tests emphasize the importance of the theoretical variables and their differing functions across new ventures and established acquirers. Hypothesis 1 suggested that newly incorporated acquirers would experience lower average cumulative abnormal returns than established bidders. Our results from Model II provide support for this prediction (p<0.05). Therefore, the lack of administrative capabilities, developed routines and valuation skills, combined with the tendency to underestimate hurdles and unduly generalize from prior experiences culminate in a negative market response at the announcements of acquisitions by new ventures. Further, this effect becomes even stronger in Model III (i.e., p<0.01), which includes the interaction terms we use to test our hypotheses 2 and 3.

Our second hypothesis predicted that acquisitions of private firms by new ventures would result in positive average CARs for bidders. Model II shows that in general
acquisitions of private targets yielded better performance for all acquirers (p<0.05).
Similar results had previously been reported by the finance literature (e.g., Chang, 1998),
which explained that in stock offers in particular, the higher CARs were to be imputed to
the better monitoring activity by target shareholders of private firms. We wished to test
this hypothesis and estimated Model II with the addition of an interaction term for Private
Target and Stock Consideration, but found that the positive CARs related to acquisitions
of privately-held firms were not driven by the method of payment decision (i.e., t=0.76,
n.s.). However, as we hypothesized, higher mean performance was explained by bidders’
ew venture status (i.e., p<0.01), as shown in Model III. Therefore, newly incorporated
acquirers are better positioned to buy private targets because both parties are more likely
to be mutually compatible, and, as discussed in the theory section of the paper, the
overpayment hazards often found in deals involving public target are less pronounced in
these transactions.

Hypothesis 3a stated that acquisitions of young targets by new ventures would yield
higher average cumulative abnormal returns for acquirers. We did not find support for
this hypothesis. Instead, we found that the acquirer’s new venture status dominated the
positive CARs associated with the purchase of newly incorporated targets (i.e., p<0.05, in
Model III). The negative sign of the interaction term (p<0.05) suggests that the greater
resourcefulness of established bidders and their absence of heuristics, which can hinder
the valuation process, are highly valued by markets.

Turning to our controls, Acquirer size was consistently very strongly negatively
associated with CARs (p<0.001 for all models). Paralleling prior work in finance, we
attribute this finding to the discretionary choices of larger bidders’ managers, which may not be aligned with the best interest of shareholders (e.g., Jensen, 1986). Lastly, the Stock Consideration variable was negative and significant in Model I ($p<0.05$), but did not reach significance in any other specification, after we included our theoretical variables. We think this point is worth mentioning because much work in M&A that has not accounted for acquirers’ age has made generalized statements on the link between method of payment and performance outcomes, possibly providing an incomplete explanation of this relationship.

3.5 Discussion

This study offers a parallel with prior work that has discussed the different capabilities and challenges borne by new ventures, and emphasized the need to account for these differences in future research. We examine how the key attributes of new ventures affect their performance in the relatively under-explored empirical context of mergers and acquisitions. Our findings show that new ventures faced significantly different outcomes from their counterparts, providing evidence of the importance of distinguishing between these two classes of firms in M&A research, particularly given the high level of participation of startups on both the acquiring and the selling sides of acquisitions.

It should be noted that while the empirical context we have chosen represents an ideal ground for the investigation of the differences of new and established firms engaged in M&A, the generalizability of our findings needs to be tested in other industries, as well
as in different time periods. Given the unprecedented startup activity of high-technology firms throughout the 1990s, it would be interesting to explicitly identify the determinants of acquisitions of and by new firms within and across economic cycles, and research whether some of the performance differences we report can partially be attributed to time- and industry-specific effects. It is worth noting that the inclusion of year-fixed effects in our model did not change the interpretation of the results, suggesting that if time-dependent differences did exist, they spanned beyond the decade comprising our sample.

Another interesting implication of this paper is that startups, albeit successful, may be unsuited to pursue acquisition strategies as a means for corporate development, as investors seem to penalize these firms at the announcement of such deals. Therefore, although the bidders in our sample experienced such growth to be able to go public within the first six years of their incorporation, their resources and capabilities did not seem to be as valuable to investors in the M&A market. This idea is consistent with the literature that has highlighted the deeply different set of skills needed to be a successful entrepreneur and those required to be a successful manager (e.g., Schumpeter, 1934; Busenitz & Barney, 1997). Further, our results suggest that, while going public is an important stage in the life of a firm, it does not constitute passing a “maturity test” for startups, as investors still react cautiously to their M&A activity. When we investigated whether acquisition experience could partially explain the differences brought forth in our analyses, we found no evidence to support this hypothesis. Future studies might explore the specific attributes sought by investors in firms seeking growth via M&A, and
perhaps shed light on when and how, in the evolutionary path undertaken by startups, such attributes are finally acquired.

While this study demonstrates the need to account for the differences between startup and established firms in M&A, our analysis has a number of limitations that future research might address. For example, our data did not permit us to account for agency theory as a determinant of acquisition performance by new acquirers. There is evidence in the finance literature that managerial motivations that stray from shareholders’ wealth maximization objectives affect M&A outcomes (e.g., Amihud, Lev & Travlos, 1990; Haspeslagh & Jemison, 1991). It would be interesting to explore the differences that can exist between startups and established firms from an agency theoretical framework, in order to determine whether the hazards from the separation of ownership and control are equally present in these two categories of firms. Owing to the performance metric we adopt in this article, our sample of acquirers only comprises public firms, and therefore it is likely that ownership will be similarly dispersed for new and established bidders alike. However, other indicators of agency problems, such as the characteristics of the board of directors, the incentive-based compensation systems and others could be systematically different and cause performance to shift in favor or against startups in M&A.

Lastly, future work could explore the differences between new and established firms and how they pursue other means of corporate development, such as outsourcing and strategic alliances. From a theoretical perspective, such research would be especially beneficial if it delved into relating how the differences between these two classes of firms
affect their decisions to integrate or to use markets. For example, if established firms hold more elaborate networks due to their age and higher diversification (Rangan, 2000), they may be more able to identify acquisition targets, while startup firms may have more localized investment partners or may have to resort to staged investments – e.g., joint ventures – in order to overcome their lack of resources and information. These and other potentially fruitful avenues of research remain to be explored by future work aiming at contributing to the development of the field of entrepreneurship.
<table>
<thead>
<tr>
<th>Industry (Number of M&amp;A Transactions)</th>
<th>Industry (Number of M&amp;A Transactions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computers and Office Equipment</strong></td>
<td><strong>Semiconductors</strong></td>
</tr>
<tr>
<td>3571 Electronic Computers (7)</td>
<td>3674 Semiconductors &amp; Related Devices (24)</td>
</tr>
<tr>
<td>3572 Computer Storage Devices (4)</td>
<td><strong>Photonics</strong></td>
</tr>
<tr>
<td>3575 Computer Terminals (0)</td>
<td>3827 Optical Instruments &amp; Lenses (1)</td>
</tr>
<tr>
<td>3577 Computer Peripherals (14)</td>
<td><strong>Defense Electronics</strong></td>
</tr>
<tr>
<td>3578 Calculating &amp; Accounting Machines (2)</td>
<td>3812 Search, Navigation Systems, Instruments, &amp; Equipment (7)</td>
</tr>
<tr>
<td>3579 Office Machines (0)</td>
<td><strong>Electromedical Equipment</strong></td>
</tr>
<tr>
<td><strong>Consumer Electronics</strong></td>
<td>3844 X-Ray Apparatus, Tubes, Related Irradiation Apparatus (0)</td>
</tr>
<tr>
<td>3651 Household Audio &amp; Video Equipment (3)</td>
<td>3845 Electromedical &amp; Electrotherapeutic Apparatus (9)</td>
</tr>
<tr>
<td>3652 Phonographic Records, Prerecorded Tapes &amp; Disks (0)</td>
<td><strong>Communications Services</strong></td>
</tr>
<tr>
<td><strong>Electronic Components &amp; Accessories</strong></td>
<td>3846 Radiotelephone Communications (3)</td>
</tr>
<tr>
<td>3671 Electron Tubes (1)</td>
<td>4813 Telephone Communications (13)</td>
</tr>
<tr>
<td>3672 Printed Circuit Boards (5)</td>
<td>4822 Telegraph &amp; Other Message</td>
</tr>
<tr>
<td>3675 Electronic Capacitors (1)</td>
<td>4841 Cable &amp; Other Pay Television Services (0)</td>
</tr>
<tr>
<td>3676 Electronic Resistors (1)</td>
<td>4899 Other Communications Services (6)</td>
</tr>
<tr>
<td>3677 Electronic Coils, Transformers, &amp; Inductors (0)</td>
<td><strong>Software Services</strong></td>
</tr>
<tr>
<td>3678 Electronic Connectors (1)</td>
<td>7371 Computer Programming Services (37)</td>
</tr>
<tr>
<td>3679 Other Electronic Components (9)</td>
<td>7372 Prepackaged Software (149)</td>
</tr>
<tr>
<td><strong>Industrial Electronics</strong></td>
<td><strong>Data Processing &amp; Information Services</strong></td>
</tr>
<tr>
<td>3821 Laboratory Apparatus (4)</td>
<td>7374 Computer Processing &amp; Data Preparation (6)</td>
</tr>
<tr>
<td>3822 Environmental Controls (1)</td>
<td>7375 Information Retrieval Services (31)</td>
</tr>
<tr>
<td>3823 Process Control Instruments (7)</td>
<td>7376 Computer Facilities Management Services (2)</td>
</tr>
<tr>
<td>3824 Fluid Meters &amp; Counting Devices (1)</td>
<td><strong>Rental, Maintenance, Other Computer-Related Services</strong></td>
</tr>
<tr>
<td>3825 Instruments to Measure Electricity (5)</td>
<td>7377 Computer Rental &amp; Leasing (0)</td>
</tr>
<tr>
<td>3826 Laboratory Analytical Instruments (4)</td>
<td>7378 Computer Maintenance &amp; Repair (1)</td>
</tr>
<tr>
<td>3829 Other Measuring &amp; Controlling Devices (8)</td>
<td>7379 Other Computer-Related Services (19)</td>
</tr>
</tbody>
</table>

**TABLE 3.1**

Sectoral Distribution of M&A Transactions

---

61
<table>
<thead>
<tr>
<th>Event day (t)</th>
<th>Full sample Mean AR(t)</th>
<th>New venture acquirers Mean AR(t) (1)</th>
<th>Established acquirers Mean AR(t) (2)</th>
<th>T-test (2)-(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>-0.0011</td>
<td>-0.0041</td>
<td>-0.0004</td>
<td>0.55</td>
</tr>
<tr>
<td>-4</td>
<td>0.0039</td>
<td>0.0009</td>
<td>0.0046†</td>
<td>0.50</td>
</tr>
<tr>
<td>-3</td>
<td>0.0035</td>
<td>-0.0025</td>
<td>0.0049†</td>
<td>1.20</td>
</tr>
<tr>
<td>-2</td>
<td>0.0034</td>
<td>0.0046</td>
<td>0.0031</td>
<td>-0.20</td>
</tr>
<tr>
<td>-1</td>
<td>0.0051†</td>
<td>-0.0051</td>
<td>0.0074*</td>
<td>1.82†</td>
</tr>
<tr>
<td>0</td>
<td>0.0102***</td>
<td>0.0140†</td>
<td>0.0094**</td>
<td>-0.54†</td>
</tr>
<tr>
<td>1</td>
<td>0.0054†</td>
<td>0.0076</td>
<td>0.0049</td>
<td>-0.33</td>
</tr>
<tr>
<td>2</td>
<td>-0.0008</td>
<td>-0.0074</td>
<td>0.0007</td>
<td>1.28</td>
</tr>
<tr>
<td>3</td>
<td>-0.0051†</td>
<td>-0.0082†</td>
<td>-0.0044</td>
<td>0.65</td>
</tr>
<tr>
<td>4</td>
<td>-0.0025</td>
<td>-0.0054</td>
<td>-0.0018</td>
<td>0.42</td>
</tr>
<tr>
<td>5</td>
<td>-0.0014</td>
<td>0.0094</td>
<td>-0.0038†</td>
<td>-1.94†</td>
</tr>
<tr>
<td>CAR_{1,1}</td>
<td>0.0223***</td>
<td>0.0165</td>
<td>0.0237***</td>
<td>0.64</td>
</tr>
<tr>
<td>CAR_{2,2}</td>
<td>0.0249***</td>
<td>0.0136</td>
<td>0.0275***</td>
<td>0.83</td>
</tr>
<tr>
<td>N</td>
<td>445</td>
<td>82</td>
<td>363</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 3.2**  
*Shareholder Wealth Effects of Acquisitions*  
* N=445. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.
<table>
<thead>
<tr>
<th>Variable</th>
<th>New Venture Acquirer Mean (Std. Dev.)</th>
<th>Established Acquirer Mean (Std. Dev.)</th>
<th>Comparison X_{new venture} to X_{established}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition experience</td>
<td>1.622 (0.254)</td>
<td>3.091 (0.215)</td>
<td>t = -4.41 ***</td>
</tr>
<tr>
<td>Acquirer leverage</td>
<td>0.410 (0.027)</td>
<td>0.389 (0.011)</td>
<td>t = -0.81</td>
</tr>
<tr>
<td>Acquirer size (assets in $ b.)</td>
<td>0.462 (0.196)</td>
<td>2.755 (0.569)</td>
<td>t = -3.81 ***</td>
</tr>
<tr>
<td>Market relatedness</td>
<td>0.756</td>
<td>0.548</td>
<td>$\chi^2 = 11.92 ***$</td>
</tr>
<tr>
<td>Stock consideration</td>
<td>0.659</td>
<td>0.411</td>
<td>$\chi^2 = 16.59 ***$</td>
</tr>
<tr>
<td>Private target</td>
<td>0.890</td>
<td>0.840</td>
<td>$\chi^2 = 1.31$</td>
</tr>
<tr>
<td>New venture target</td>
<td>0.585</td>
<td>0.377</td>
<td>$\chi^2 = 11.91 ***$</td>
</tr>
</tbody>
</table>

**TABLE 3.3**

Descriptive Statistics for New Ventures and Established Acquirers\(^b\)

\(^b\) N=445. \(\dagger\) p<0.10, \(*\) p<0.05, \(**\) p<0.01, \(***\) p<0.001.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CARs(t=-1,+1)</td>
<td>0.022</td>
<td>0.092</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Acquisition experience</td>
<td>0.977</td>
<td>0.823</td>
<td>-0.164***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Acquirer leverage</td>
<td>0.393</td>
<td>0.214</td>
<td>-0.100*</td>
<td>0.116*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Acquirer size</td>
<td>5.189</td>
<td>2.097</td>
<td>-0.292***</td>
<td>0.552***</td>
<td>0.220***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Market relatedness</td>
<td>0.587</td>
<td>0.493</td>
<td>-0.021</td>
<td>-0.072</td>
<td>-0.146**</td>
<td>-0.242***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Stock consideration</td>
<td>0.456</td>
<td>0.499</td>
<td>-0.054</td>
<td>-0.125**</td>
<td>-0.144**</td>
<td>-0.154**</td>
<td>0.219***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Private target</td>
<td>0.849</td>
<td>0.358</td>
<td>0.185***</td>
<td>-0.114*</td>
<td>-0.078</td>
<td>-0.220***</td>
<td>0.029</td>
<td>-0.157***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. New venture target</td>
<td>0.416</td>
<td>0.493</td>
<td>0.111*</td>
<td>-0.081†</td>
<td>-0.067</td>
<td>-0.094*</td>
<td>0.032</td>
<td>-0.013</td>
<td>0.189***</td>
<td></td>
</tr>
<tr>
<td>9. New venture acquirer</td>
<td>0.184</td>
<td>0.388</td>
<td>-0.030</td>
<td>-0.173***</td>
<td>0.038</td>
<td>-0.248***</td>
<td>0.164***</td>
<td>0.193***</td>
<td>0.054</td>
<td>0.164***</td>
</tr>
</tbody>
</table>

**TABLE 3.4**

Matrix of Pearson Correlation Coefficients<sup>c</sup>

<sup>c</sup>N=445. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.
## TABLE 3.5
### Multiple Regression Results

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Model I</th>
<th>Model II</th>
<th>Model III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.120***</td>
<td>0.088***</td>
<td>0.095***</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.021)</td>
<td>(0.021)</td>
</tr>
<tr>
<td>Acquisition experience (x10⁻³)</td>
<td>-0.258 (6.090)</td>
<td>-0.407 (6.030)</td>
<td>-0.139 (5.970)</td>
</tr>
<tr>
<td>Acquirer leverage</td>
<td>-0.024 (0.020)</td>
<td>-0.015 (0.020)</td>
<td>-0.009 (0.020)</td>
</tr>
<tr>
<td>Acquirer size</td>
<td>-0.014*** (0.002)</td>
<td>-0.013*** (0.003)</td>
<td>-0.014*** (0.002)</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.009)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Market relatedness</td>
<td>-0.016† (0.009)</td>
<td>-0.014 (0.009)</td>
<td>-0.014 (0.009)</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.009)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Stock consideration</td>
<td>-0.017* (0.009)</td>
<td>-0.010 (0.009)</td>
<td>-0.010 (0.009)</td>
</tr>
<tr>
<td>Private target</td>
<td>0.025* (0.012)</td>
<td>0.012 (0.013)</td>
<td></td>
</tr>
<tr>
<td>New venture target</td>
<td>0.015† (0.009)</td>
<td>0.024* (0.009)</td>
<td></td>
</tr>
<tr>
<td>New venture acquirer</td>
<td>-0.024* (0.011)</td>
<td>-0.079** (0.031)</td>
<td></td>
</tr>
<tr>
<td>New venture acquirer * Private target</td>
<td>0.097*** (0.033)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.056* (0.022)</td>
<td></td>
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</tr>
<tr>
<td>Model F</td>
<td>10.190***</td>
<td>7.970***</td>
<td>7.690***</td>
</tr>
<tr>
<td>Δ F</td>
<td>---</td>
<td>3.925**</td>
<td>5.866***</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.104</td>
<td>0.128</td>
<td>0.151</td>
</tr>
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* N=445. Standard errors appear in parentheses. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.
CHAPTER 4
SHARE CONTRACTING IN CORPORATE ACQUISITIONS

Many prior studies of firms’ external corporate development activities have emphasized that organizations choose among discrete governance structures based on their costs and associated exchange hazards (e.g., Williamson, 1991). For example, when the resources sought from a target firm are indivisible, the acquirer can turn to a joint venture instead of an acquisition to avoid the integration costs associated with an acquisition (e.g., Hennart, 1988). This comparative institutional framing has contributed important insights into the efficiency implications of various corporate investment decisions such as outsourcing versus vertical integration, licensing versus foreign direct investment, and so forth.

As a consequence of this focus on discrete governance structures, the contractual heterogeneity underlying each discrete governance mode has gone relatively unexplored, however (Poppo & Zenger, 2002). As James (2000) notes, prior work is sometimes limited in implying that contractual forms are necessarily governed by one governance structure. This assumption is useful in many empirical applications, and it also provides for a parsimonious depiction of increased control as more hierarchical forms of governance displace market-mediated exchanges in the markets-hierarchies continuum.
It is theoretically useful, however, to separate contractual forms from discrete governance structures when investigating corporate investment decisions. Whereas discrete governance structures can be viewed as broader institutional modes (Williamson, 1979) that establish a “system of rules plus the instruments that serve to enforce the rules” (Furubotn & Richter, 1997: 5), contractual forms enable firms to specify the allocations of rights, responsibilities, risks, and rewards in more precise terms. As a result, distinguishing contractual forms and governance structures not only poses an attributional question of how to assign credit for certain organizational outcomes, it also raises the possibility that firms’ contractual choices can make certain governance structures begin to take on some of the features commonly associated with other governance structures.

In this paper, we wish to examine firms’ contractual decisions by investigating contingent earnouts as a means of structuring M&A. Contingent earnouts specify variable payments from the acquirer to the target based on the latter’s ability to meet pre-specified performance goals after the deal takes place (e.g., Kohers & Ang, 2000; Datar, Frankel, & Wolfson, 2001). Rather than paying for the target firm up-front, an acquirer makes deferred payments that are tied to the target’s actual performance after the deal has been consummated. Payment formulas may rely upon such metrics as return on assets, revenue growth, and so forth, and payments are typically made for a relatively short period of time (i.e., 3-5 years).

Our theoretical framework extends information economics as applied in product and labor markets (e.g., Akerlof, 1970; Spence, 1974) to the market for corporate
resources in the M&A context. Prior strategy research using transaction cost economics to study acquisitions and other forms of corporate investment has tended to rely heavily on the Williamsonian framework to examine the relative efficiency of alternative organizational forms subject to various *ex post* exchange hazards such as hold-up, moral hazard, and so forth. We instead wish to highlight the *ex ante* exchange hazard of adverse selection that arises as firms deliberate over the exchange of resources subject to information asymmetries.

The specific argument that we develop suggests that because earnouts are share contracts that shift risk from the acquirer to the target, they can mitigate the effects of information asymmetry in acquisitions under several well-defined conditions reflecting the status of the target firm and its relationship to the acquirer. Moreover, in contrast to the emphasis in existing M&A literature on firms’ use of governance solutions (e.g., shared ownership) to this problem (Balakrishnan & Koza, 1993), we suggest and show that firms may use earnouts as a substitute, contractual remedy. Given that earnouts may also have important limitations such as moral hazard problems, it is therefore interesting to investigate when firms select this deal structuring device.

The remainder of the paper is organized as follows: In the next section, we develop several hypotheses that identify conditions under which acquirers are likely to experience valuation challenges due to asymmetric information and therefore find contingent earnouts attractive. More specifically, we discuss how these valuation problems and the corresponding structuring of M&A deals vary across privately-held and publicly-traded targets, new ventures and more established targets, and transactions in which the
knowledge requirements of the firms’ industries are more or less dissimilar. A subsequent section contains details on the research design, which is followed by a presentation of the study’s findings. The empirical evidence provides strong support for the general proposition that firms can address information asymmetries through earnouts as contractual forms. Results from bivariate probit models that simultaneously model firms’ governance and contractual decisions also provide evidence that earnouts substitute for shared ownership. The paper concludes with a discussion of the implications of the findings for corporate strategy research on acquisitions and organizational governance.

4.2 Background Theory

During the last decade, mergers and acquisitions represented one of the primary growth vehicles by firms, increasing five-fold in number and thirteen-fold in dollar value from 1990 to 1999. However, the high failure rates of acquisitions are also well-known, and this has prompted considerable research on the performance implications of acquisitions. For example, Kaplan and Weisbach (1992) found that 44 percent of the acquisitions in the 1970s and 1980s were subsequently divested, and a more recent article reported that 61 percent of buyers obtained lower performance than their non-acquiring peers (Henry & Jespersen, 2002).

Considerable research in strategy and finance has investigated the root causes of this phenomenon (e.g., Sirower, 1997; Hitt, Harrison, & Ireland, 2001). For instance, some studies relying on agency theory argue that negative M&A performance outcomes can be partially attributed to the misaligned incentives between the acquiring firm’s
owners and managers (e.g., Amihud & Lev, 1981; Jensen, 1986). As another illustration, empirical studies have also associated M&A failures with post-merger management challenges, both in terms of structural integration problems (Pablo, 1994; Finkelstein & Hambrick, 1996; Larsson & Finkelstein, 1999) and cultural differences across buyers and sellers (e.g., Datta, 1991; Chatterjee et al., 1992). Another issue that may surface during the due diligence and negotiation stages of M&A is the challenge of asymmetric information, which is the focus of this study.

The problems associated with asymmetric information in M&A markets can be illustrated by extending Akerlof’s (1970) model of the ‘market for lemons’ in product markets. If a seller has private information regarding its value and if it cannot convey it to the buyer, the buyer’s offer will be appropriately discounted in view of the potential incentive for the target to inflate representations of its claims. The buyer also bears transaction costs in attempting to screen out attractive M&A targets from less attractive ones. Thus, in the absence of signals that serve to differentiate high and low quality target firms and in the absence of asocial or social remedies such as warranties or trust, M&A markets will be subject to inefficiencies due to more extensive information gathering and negotiation processes. Moreover, some attractive deals may not proceed and in other cases acquirers may bear the consequences of adverse selection.

Prior research in corporate strategy and finance has identified two means of dealing with the challenges posed by asymmetric information in M&A deals. First, firms may turn to a different governance arrangement by sharing equity and staging their investments. Balakrishnan and Koza (1993), for instance, suggest that equity joint
ventures are attractive in addressing information asymmetry because they enable partners to experiment with targeted resources on a first-hand basis. Such arrangements also allow a firm to expand through the acquisition of additional equity ownership as new information becomes available.

Second, theoretical work in finance has highlighted the risk-sharing benefits of using stock as a form of consideration in acquisitions. By offering target firm shareholders stock in the bidding firm, the acquirer is able to shift a portion of the overpayment risk to the seller (e.g., Eckbo, Giammarino, & Heinkel, 1990; Fishman, 1989). Because such an arrangement will be more costly for low-quality targets than high-quality targets, the willingness of the target to share ownership in the combined business provides a signal of its value that can be useful in mitigating the effects of information asymmetry (Spence, 1974). However, this form of structuring M&A deals also has an important drawback: Because there is information asymmetry not only with respect to the quality of the target’s resources, but also with respect to the true value of the bidding firm, share offerings may indicate to equity investors that the bidder’s stock is overvalued (Hansen, 1987), leading to negative equity market responses.

Contingent earnouts are contractual alternatives that can reduce the risk of adverse selection in corporate acquisitions because, as noted earlier, these contracts involve deferred variable payments tied to the target’s ability to meet pre-specified performance goals within a certain time frame after the deal has taken place. Thus, as in the case of equity collaborations, earnouts enable the target firm to obtain a share of the business’ profit stream, but ownership by the acquiring party can be complete. As in the case of
stock consideration, earnouts transfer risk from the bidder to the target, but they do not suffer from the ‘double lemons’ problem of signaling overvaluation of the bidder’s stock to equity investors.

4.3 Development of Hypotheses

In the hypotheses developed below, we draw upon research in information economics to relate firms’ usage of earnouts to three contingencies that make information asymmetries and the risk of adverse selection problematic in conducting corporate acquisitions. First, we highlight the going public event in the development of firms as an important transitional stage that can have implications for the efficiency of M&A transactions and the manner in which they are structured for privately-held and publicly-traded firms. Second, we discuss how firms’ usage of earnouts is likely to vary across new ventures and established targets due to evolutionary changes in internal resources, external relationships, and decision-making processes as firms mature. Third, we suggest that valuation challenges may arise from differing knowledge requirements in buyers’ and sellers’ industries, independent of the absolute characteristics of target firms. Finally, in examining whether or not acquirers turn to contingent earnouts as contractual remedies to the problem of asymmetric information and the risk of adverse selection in M&A, we also consider whether this contractual alternative substitutes for governance solutions such as acquiring partial ownership of the target firm.
4.3.1 Private versus Public Targets

The risk of adverse selection confronting an acquirer, and hence its decision to use a contingent earnout when conducting an acquisition, will be a function of the information available on the target firm. Our first prediction suggests that the valuation challenges an acquirer faces will be higher for privately-held targets than publicly-traded firms because of some of the direct consequences of a seller’s public status. For instance, the reporting and disclosure requirements of listing on an exchange increase the quantity and quality of information available on a publicly-traded target. The collective judgment of investors can help buyers calibrate their bids (e.g., Hellwig, 1980) because share prices in stock markets incorporate heterogeneous information that cannot be inferred directly from a firm’s accounting data (Holmstrom & Tirole, 1993). Consistent with these arguments, Simon (1989) provides evidence that increased financial disclosure requirements reduces investors’ forecast errors.

Apart from reducing information asymmetries directly, a target’s public status can offer a number of indirect benefits that can lessen the risk of adverse selection for acquirers. For instance, models in financial economics suggest that because it is difficult for potential investors to value the business prospects of private firms (e.g., McConnell & Pettit, 1984; Becchetti & Trovato, 2002), acquirers can rely upon the equity market as an independent means of screening attractive targets from less attractive ones (Ellingsen & Rydqvist, 1997). During the process of going public, the firm is also in a position to signal its value in a number of ways, including bearing the direct costs of registration and underwriting fees (Ritter, 1987) as well as the indirect costs of underpricing (Allen &
Faulhaber, 1989). Issuing firms can also benefit from the reputations of investment banks, whose repeat business encourages them to refrain from misrepresentations that would endanger their reputational capital (Beatty & Ritter, 1986). Descriptive and anecdotal evidence on M&A patterns indicate that going public in fact increases the likelihood of a target firm being acquired (Rock, Rock, & Sikora, 1994; Pagano, Panetta, & Zingales, 1998; Field & Mulherin, 1999).

Taken together, these arguments suggest that acquirers purchasing private rather than public targets face higher information costs and a greater risk of adverse selection. Therefore we posit:

**Hypothesis 1:** The likelihood of using a contingent earnout is higher for acquisitions of privately-held targets than for acquisitions of publicly-traded firms.

### 4.3.2 New Ventures versus Established Targets

Although the previous hypothesis suggests that the public status of targets can affect transaction costs in M&A markets, valuation problems can diminish over time independent of a seller’s status, for several reasons. Little historical and codified information tends to be available on the resources of a newly-incorporated target, and very recent information on its performance can be problematic because new ventures often have organizational routines and performance that are not reliable and lack accountability (Hannan & Freeman, 1989). These problems are exacerbated by new ventures’ lack of internal administrative skills and slack resources (Niederkofler, 1991). Moreover, younger companies confront external constraints that include a lack of
legitimacy, which arises due to insufficient support from relevant organizations or as a consequence of segmentation in the market for interorganizational relationships that can have the effect of endorsing the firm (Carter & Manaster, 1990; Podolny, 1993).

In addition to these considerations, a number of behavioral biases in new ventures can also exacerbate valuation problems during M&A negotiation processes and make earnouts attractive. Entrepreneurs, for instance, have been shown to exhibit overconfidence biases that lead them to overestimate the attractiveness of their opportunities (e.g., Cooper, Dunkelberg, & Woo, 1988) and to hold exaggerated perceptions of the accuracy of their judgments (e.g., Busenitz & Barney, 1997; Baron, 1998). Similarly, entrepreneurs are more prone to make generalization errors from prior experiences that may not be applicable to future situations as the firm develops (e.g., Smith et. al, 1988; Mullins, 1996; Baron, 1998).

As the target firm ages, therefore, historical information accumulates on its operations, its organizational routines become more developed and reliable, institutional constraints relax, and valuation disagreements due to information asymmetries and related behavioral biases become less pronounced. We therefore predict that earnouts will be more attractive in acquisitions of new ventures rather than established firms:

**Hypothesis 2:** The likelihood of using a contingent earnout is higher for acquisitions of new ventures than for acquisitions of established firms.
4.3.3 Target Industry Knowledge Requirements

Although the two previous hypotheses consider absolute characteristics of target firms that can have an impact on acquirers’ information costs and their risk of adverse selection in acquisitions, we also suggest that inefficiencies in M&A transactions will be influenced by the knowledge features of the acquirer-target dyad. More specifically, for a particular target firm, the level of information asymmetry will vary across prospective acquirers based on the similarities or differences in the knowledge bases of the negotiating parties.

Following prior research on corporate diversification and M&A, we focus on the degree of dissimilarity in the knowledge requirements of acquirers’ and targets’ industries (e.g., Chang, 1996; Chang & Singh, 1999; Coff, 1999). At one extreme, in intra-industry transactions acquirers will not only be more aware of potential target firms, but they will also tend to be more familiar with such firms’ resources, buyers and suppliers, and management capabilities (e.g., Montgomery & Hariharan, 1991). By contrast, as the knowledge requirements of a target’s industry diverge from those of the acquirer’s, information asymmetries will tend to increase and the target firm finds it harder to convey credibly the value of its resources, even if it is inclined to do so (e.g., Ravenscraft & Scherer, 1987). In many inter-industry transactions, the acquirer will also tend to be less familiar with the business practices and corporate cultures in the destination industry (Gordon, 1991), which similarly increases incentives for the target firm to engage in misrepresentations. Moreover, given tacit differences in the ways in which the acquirer and target firm conceptualize their businesses when they draw upon
disparate expertise (e.g., Prahalad & Bettis, 1986), it becomes more difficult for the acquirer to gauge the quality and transferability of the target’s resources. We therefore hypothesize:

**Hypothesis 3:** The greater the difference in the knowledge requirements of the acquirer’s and target’s industries, the greater the likelihood of using a contingent earnout for an acquisition.

### 4.3.4 Interdependence of Contractual and Governance Decisions

The above hypotheses have identified several conditions that are likely to lead to M&A valuation challenges and consequently acquirers’ decisions to use contingent earnouts as contractual remedies. As noted earlier, however, prior research in corporate strategy has emphasized that firms may turn instead to less commitment-intensive governance structures to respond to the risk of adverse selection. For instance, risk can be transferred from the acquirer to the target by having the latter retain an ownership share in the business. Partial acquisitions also offer the acquirer the opportunity to stage its investment once more information becomes available rather than committing to complete ownership up front. Given that the above discussion suggests that the contractual solution of negotiating an earnout may substitute for the governance remedy of shared ownership, we wish to model simultaneously firms’ interdependent decisions to employ these responses to the hazards created by information asymmetries in corporate acquisitions.
4.4 Methods

4.4.1 Sample

In order to test the hypotheses developed above, a sample of acquisitions was developed from the M&A module of the Security Data Corporation (SDC) database. This database is useful for this analysis not only because it provides a comprehensive source of acquisition activity, but because it documents particular deal characteristics such as M&A ownership structures and the specific types of payments firms use to structure acquisition deals. Given the heterogeneity in firms’ methods of paying for acquisitions, we focused on acquisitions that firms financed using either all cash or stock for comparison purposes. As noted earlier, cash payments can involve heightened exposures to the risk of adverse selection under certain circumstances, whereas stock payments can shift risk from the bidder to the target firm, but also can signal that the bidder’s stock is overvalued (Hansen, 1987). Four percent of the transactions involved earnouts, 40 percent involved cash payments, and 56 percent involved stock payments. The sample focuses on a broad cross-section of acquisitions of domestic firms by US bidders during the 1993-2000 timeframe, and LBO firms were excluded. Roughly forty-three percent of the transactions were in services; 30.4 were in manufacturing; and 11.6 were in finance, insurance, and real estate. During the time period considered, the number of M&A deals increased fairly steadily, such that 5 percent of the sample came from 1993 and 18 percent from 2000. The year 1999 saw the largest number of transactions (i.e., 19%), and there was a slight decrease in M&A volume in 2000. We calculated a Chi-square statistic to compare the temporal distributions of M&A transactions structured
with and without earnouts, finding that both types of acquisitions followed similar patterns over time ($\chi^2=11.2$, n.s.). After accounting for missing accounting data from Compustat as well as missing data from other sources with which our data were merged, the final sample comprised 2058 deals. Additional descriptive statistics appear in the results section below.

### 4.4.2 Measures and Data

**Dependent variables.** The primary dependent variable in our analysis is a dichotomous measure indicating whether or not firms used a contingent earnout in their M&A. Thus, $Earnout$ equals one for acquisitions involving earnouts, and zero otherwise. The method of payment in acquisitions was determined with data obtained by the SDC database. As noted below in a subsection on model specifications, we also modeled earnouts simultaneously with the ownership structure of M&A deals in order to examine the potential interdependence of firms’ contractual and ownership responses to adverse selection problems in corporate acquisitions. In these models, we relied upon an indicator variable, $Partial\ acquisition$, in order compare acquisitions in which the bidder took less than complete ownership of the target firms with deals in which the bidder fully acquired the target. Data for this variable were also obtained from the SDC database.

**Explanatory variables.** Our first theoretical variable concerns the status of the target firm and whether it is privately-held or publicly-traded. $Private\ target$ equals 1 for private firms, and 0 for firms that are publicly-traded, as indicated by SDC. For target firms coded as subsidiaries rather than as private or public, the firm’s status was
determined through data provided on ultimate parent firms. If the private or public status of the parent firm could not be established, the observation was deleted from the analysis.

The measure used to distinguish new ventures and established firms at the time of the acquisition was based on the firm’s year of incorporation. New venture equals 1 for firms six years of age and younger, and 0 otherwise. Some debate exists concerning when a firm should be seen as new or established, with cutoff values used as high as eight or twelve years (e.g., Covin, Slevin & Covin, 1990). However, we sought to be more conservative and therefore followed recent work in the field, which utilizes a shorter, six-year cutoff value (i.e., Zahra, Ireland & Hitt, 2000). Nevertheless, in order to explore the robustness of the results to the selection of the cutoff value, we reran all of the analyses using cutoff values of four and eight years. When using these alternative cutoff levels, the interpretations presented in the next section continued to hold. Data for this variable were obtained from the Business & Company Resource Center, which is administered by the Thomson Corporation and provides information on firms’ business profiles and histories. In order to obtain additional data for this variable, we also conducted searches using the Lexis-Nexis Academic Database.

Our third theoretical variable is Knowledge distance. This construct 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; Chang & Singh, 1999; Coff, 1999). This variable measures the Euclidian distance between two industries based on their knowledge requirements, as proxied by their respective employment distributions. Data for the calculation of this variable were obtained from the Occupation
Employment Survey from the Bureau of Labor Statistics, which provides data on the distribution of employment across 224 occupational categories within industries at the 3-digit SIC level. Specifically:

\[
(1) \quad \text{Knowledge Distance} = \left[ \sum_{k=1}^{224} (E_A_k - E_T_k)^2 \right]^{0.5}
\]

where \(E_A_k\) and \(E_T_k\) are the proportions of the workers in occupation \(k\) in the acquirer’s and the target’s industries, respectively.

**Control variables.** While our primary objective is to develop a parsimonious model that explains firms’ choices concerning M&A deal structures based on various sources of information asymmetry, we sought to account for other potential factors that might influence M&A designs as well as relate to the theoretical variables of interest. First, we incorporated a control for the bidder’s acquisition experience because experienced acquirers may select more appropriate targets and be able to value them more efficiently than inexperienced firms (e.g., Fowler & Schmidt 1989; Bruton, Oviatt, & White, 1994; Vermeulen & Barkema, 2001). We calculated *Acquisition experience* as the logarithm of one plus the number of M&A transactions the firm carried out in the ten years preceding the focal transaction. The logarithmic transformation was employed to address significant positive skewness in the untransformed count measure. The SDC database was used to assemble firms’ deal histories. Second, we included a measure of the bidder’s slack financial resources that may buffer it from uncertainties and provide access to financial resources to carry out acquisitions. Specifically, *Acquirer leverage* was measured as the ratio of the bidder’s total liabilities to total equity, which serves as
an inverse indicator of financial slack. Data for this variable were obtained from Compustat. Third, we implemented a control for the acquiring firm’s size since larger firms may have less need to transfer risk to targets due to greater project diversity, market power, or other resource endowments (e.g., Scherer & Ross, 1990; Delacroix & Swaminathan, 1991). The variable Acquirer size was calculated as the logarithm of the acquirer’s total assets at the end of the year prior to the acquisition. In order to account for heterogeneity in destination industries, we introduced fixed effects for target firm industries. Finally, in order to address the temporal influence of factors not included in our model, we incorporated controls for year fixed effects.

4.4.3 Model Specifications

The basic structure of the multivariate statistical models used to test our first three hypotheses is as follows:

\[
\text{Earnout} = \beta_0 + \beta_1 \text{Private Target} + \beta_2 \text{New Venture} + \beta_3 \text{Knowledge Distance} + \beta_4 \text{Acquirer Experience} + \beta_5 \text{Acquirer Leverage} + \beta_6 \text{Acquirer Size} + \gamma \text{Target Industry Fixed Effects} + \delta \text{Year Fixed Effects} + \epsilon.
\]

Given that the dependent variable is dichotomous, this model was estimated using a binomial logit model. This specification was used for the full sample, as well as for two sub-samples defined by cash-only deals and earnouts as well as by stock-only deals and earnouts.

In order to investigate the relationship between firms’ use of contractual and governance remedies to the risk of adverse selection in M&A transactions, we also sought to estimate two models simultaneously that account for firms’ decisions
concerning whether or not to use earnouts and whether to acquire full or partial ownership of targets. The potential interdependence of these decisions implies that the error terms in the two choice models may be correlated, which necessitates a modeling approach in the same spirit as seemingly unrelated regression for continuous dependent variables. This is accomplished through the use of a bivariate probit model, which extends the standard probit model to two equations and exploits the correlations among the disturbances. A general expression of this model follows:

\[(3) y_1^* = X\beta_1 + \varepsilon_1 \]
\[y_2^* = X\beta_2 + \varepsilon_2,\]

where \(y_1^*\) and \(y_2^*\) are unobservable variables for the earnout and partial acquisition choices, respectively. These latent variables are related to the binary choice variables in the following way:

\[(4) y_j = \begin{cases} 1 & \text{if } y_j^* > 0 \\ 0 & \text{if } y_j^* \leq 0 \end{cases} \quad j = 1, 2,\]

where \(j=1\) corresponds to the earnout decision and \(j=2\) corresponds to the ownership decision. \(y_1 = 1\) when firms use earnouts, and \(y_1 = 0\) otherwise; \(y_2 = 1\) when firms acquire partial ownership, and \(y_2 = 0\) when firms acquire full ownership. The error terms \(\varepsilon_1\) and \(\varepsilon_2\) are assumed to follow a joint normal distribution with \(E[\varepsilon_1] = E[\varepsilon_2] = 0\), \(\text{Var}[\varepsilon_1] = \text{Var}[\varepsilon_2] = 1\), and \(\text{Cov}[\varepsilon_1, \varepsilon_2] = \rho\). When the estimated correlation between the disturbances is zero, the likelihood function is equivalent to those obtained when estimating two binomial probit models independently. When the correlation is
significantly different from zero, separate estimation of the two equations in (3) yields consistent yet inefficient estimates (Greene, 1997). Negative values for \( \rho \) imply substitute decisions because unobservables that lead to a greater likelihood of using an earnout contribute to a lower likelihood of a partial acquisition. Conversely, positive values of \( \rho \) suggest complementary decisions since unobservables that increase the likelihood of one decision also increase the likelihood of the other decision.

4.5 Results

Table 1 presents descriptive statistics and a correlation matrix for the sampled acquisitions. About four percent of the transactions included an earnout provision, and the incidence of earnouts varied across investment contexts. For instance, the usage of earnouts dropped to 1.3 percent for partial acquisitions, which represented seven percent of the deals. By contrast, the frequency of earnouts increased to 6.1 percent for private targets. In fact, of the negotiated earnouts, over ninety percent were used in the acquisition of private firms (\( \chi^2 = 34.9, \ p<0.0001 \)). The incidence of partial acquisitions was also higher for private targets (\( \chi^2 = 5.8, \ p<0.05 \)), and private targets accounted for approximately 70 percent of the partial acquisitions. Earnouts were also more frequently used in acquisitions of new ventures than established firms (\( \chi^2 = 9.5, \ p<0.01 \)). In a similar fashion, partial acquisitions were employed 16.8 percent of the time for new ventures, and only 1.6 percent of the time for established firms (i.e., \( \chi^2 = 164.6, \ p<0.0001 \)). Not only were new ventures more likely to be private rather than public (p<0.001), such targets were more likely to be situated in industries with different
knowledge requirements vis-à-vis acquirers (p<0.001). The average acquirer had conducted less than seven prior acquisitions, and firms’ acquisition experience ranged from zero (i.e., 5 percent of the sample) to 73 transactions.

Table 2 presents the estimation results of the binomial logit models that explain when firms negotiate earnouts into their acquisitions. Model I represents a baseline specification that consists of the control variables, and Model II augments this specification by including the theoretical variables. Both models are significant at the 0.001 level, and a likelihood ratio test indicates that the theoretical covariates significantly improve upon the model’s explanatory power (p<0.001).

All three hypotheses received empirical support in the estimation results for the full sample. Hypothesis 1 suggested that acquisitions of private targets are more likely to involve an earnout than acquisitions of publicly-traded targets. The coefficient estimate for the private target variable is positive and highly significant (p<0.001). The evidence suggests that earnouts are also more likely to be used in the acquisition of new ventures than established targets (p<0.05), which provides support for our second hypothesis. Finally, the third hypothesis predicted that the greater the differences in the knowledge requirements of the bidder’s and target’s industries, the greater the likelihood of a contingent earnout. The positive coefficient on the knowledge distance measure provides support for this prediction as well (p<0.05). Taken together, therefore, the results suggest that earnouts can be useful contractual vehicles to respond to information asymmetries and the risk of adverse selection in acquisitions.
As a check on the robustness of these findings for the full sample, we separated out cash and stock transactions in Models III through VI when drawing comparisons with earnouts. Models III and IV compare earnouts and cash deals, and Models V and VI compare earnouts and stock transactions. As before, Models III and V offer baseline specifications consisting of the control variables, and Models IV and VI introduce the theoretical variables. All four models are highly significant on an overall basis (p<0.001), and likelihood ratio tests reveal that the theoretical variables significantly improve upon the explanatory power of the baseline models for both subsamples (both p<0.001).

The results from the disaggregated analyses largely conform to those discussed above for the full sample. As before, the analyses of the two subsamples indicate that firms are more likely to use earnouts when acquiring privately-held targets rather than public firms (p<0.001) and when acquiring new ventures rather than established targets (p<0.01 in Model IV, p<0.05 in Model VI). Firms also turn to earnouts rather than stock payments when purchasing targets with different knowledge requirements (p<0.05 in Model VI). However, the positive coefficient estimate on the knowledge distance measure in Model IV does not reach statistical significance. One potential explanation for this insignificant result is heterogeneity in firm’s M&A rationales that are not accounted for in the model. For example, Coff (1999) suggests that firms may have motives for engaging in unrelated diversification, including exploiting internal capital markets and facilitating market discipline, that reduce their information needs and the use of contingent forms of payment.
Table 3 presents the estimation results for the simultaneous estimation of earnout and partial acquisition models. The model appearing in columns I and II is a baseline specification consisting of the control variables, and the theoretical variables are introduced in columns III and IV. Both models are estimated for the full sample and are highly significant on an overall basis (p<0.001), and the theoretical variables are jointly significant (p<0.001).

The negative estimate for the correlation among the contractual and ownership outcomes provides modest evidence that firm’s choices concerning the usage of earnouts and partial acquisitions are substitutive in nature (p<0.10). As before, columns V-XII separate out cash and stock payments when drawing comparisons with earnouts in an effort to explore further the interdependence between these choices. As for the full sample analysis, all models are significant on an overall basis, and the full models provide a significant improvement in explanatory power over the reduced models (both p<0.001). The models also reveal that the substitutive relationship between earnouts and partial ownership apply to the subsample consisting of earnouts and cash deals (e.g., in columns VII and VIII, r=-0.78, p<0.001). In the models appearing in columns IX-XII that compare earnouts with stock transactions, however, the estimate for ρ is not statistically different from zero, suggesting that the decisions to use earnouts and partial ownership are independent for this subsample.

One explanation for this finding is that no acquisitions in which the bidder purchased less than fifty percent ownership are present in the subsample consisting of earnouts and stock deals, and these minority acquisitions present the lowest levels of risk.
owing to adverse selection. To explore whether different ownership ranges explain the relationship between firms’ earnout and ownership choices, we excluded these acquisitions from the full sample analysis (i.e., columns I-IV) and the subsample of earnouts and cash deals (i.e., columns V-VIII) and reran the models. When these minority acquisitions were excluded from the models, we obtained insignificant parameter estimates for rho for the full sample as well as for the subsample consisting of earnouts and cash deals. This suggests that the substitutive relationship between earnouts and partial acquisitions is due to minority acquisitions rather than majority acquisitions. When the latter were instead excluded from the analysis, the estimated negative correlation between the disturbances was significant for the full sample at the 0.01 level, which also is consistent with this explanation.

Turning to the coefficient estimates for the theoretical variables, the results for earnouts in Columns III, VII, and XI correspond to those presented earlier in the binomial logit model. The interpretation of the parameter estimates in the partial acquisition equations also correspond with those from simple logit models of this choice. Overall, firms appear to use partial acquisitions when purchasing new ventures rather than established firms and when diversifying into industries with knowledge requirements dissimilar from those of the bidder’s core business (both p<0.001). However, it appears that firms’ decisions concerning M&A ownership do not reflect the private versus public status of target firms.

Finally, the results for the control variables deserve mentioning. Acquisition experience tends to be associated with the choice of full acquisitions over partial
acquisitions, but not the selection of earnouts. There is also evidence that larger firms see less need to use earnouts, but are inclined to structure their M&A transactions using partial ownership when not using stock as a form of consideration. There is also evidence that both industry and year fixed effects partially explain firms’ decisions regarding M&A deal structures.

4.6 Discussion

While a substantial body of research on M&A exists in the strategy literature, this work has not considered earnouts as a deal structuring device. In fact, most of the research on M&A transaction design has occurred in the finance literature, which views alternative deal structures such as cash payments and stock financing primarily as methods of paying for acquisitions (e.g., Travlos, 1987; Fishman, 1989; Martin, 1996; Chang, 1998). We apply Akerlof’s (1970) model for the “market for lemon’s” in product markets to the M&A market and suggest that the contractual choices firms make reflect informational considerations and that firms’ contractual and organizational decisions are interdependent. As a consequence, our arguments and results portray earnouts not only as a type of consideration in M&A transactions, but as a contractual choice that potentially has broader implications for organizational governance and the management of acquisitions.

Taken together, the findings of this paper provide strong support for the perspective that acquiring firms tend to use contingent earnouts when information asymmetry exists across bidders and targets. Like warranties in product markets (Akerlof, 1970),
contingent earnouts in M&A markets can provide asocial remedies to information asymmetries and the problem of adverse selection by enabling buyers to reverse the effects of transactions and allowing sellers to signal the quality of their resources. Since there are different asocial and social remedies by which firms might address inefficiencies in M&A markets (e.g., going public prior to divestiture, forming joint ventures, relying on networks or trust, etc.), future research might compare and contrast these alternative remedies to the risk of adverse selection rather than investigating potential responses in isolation from one another.

Our analysis indicates that firms tend to use contingent earnouts under three conditions and that this contractual solution substitutes for the decision to engage in a partial acquisition. When targets are private, newly incorporated, or operate in industries with different knowledge requirements, it is more difficult for targets to convey their value credibly and for bidders to evaluate targets efficiently, which leaves room for misrepresentations in the negotiation process. Furthermore, while prior research has emphasized that stock-based consideration provides a contingent payment structure that also transfers risk from the bidder to the target (e.g., Eckbo, Giammarino, & Heinkel, 1990), we find that firms are more likely to use earnouts than stock payments under these three conditions. This may be due to the fact that earnouts do not signal to equity investors that the acquirer’s stock is overvalued (Hansen, 1987).

Despite having these benefits, earnouts also are subject to a number of drawbacks, and future studies might address these limitations explicitly. For example, while earnouts might be responsive to information asymmetry challenges confronting bidders and
targets, they may also give rise to moral hazard problems. When target firm management remains involved in the acquired unit, it may have an incentive to maximize its proceeds rather than take actions consistent with the long-term interests of the business. If, for instance, the payout formula is based on the target’s return on assets, target firm managers may choose not to incur expenses such as maintenance or advertising since such outlays would have an adverse, short-run effect on the payments received. Moreover, relative to open-ended exchanges such as equity collaborations that rely in part on the shadow of the future (Axelrod, 1984), the time-boundedness of earnouts in M&A creates incentives for opportunism as the contract expiration date nears. These and other conflicts or interest may arise given that target firm management acts as an agent of the acquiring firms’ shareholders after the deal has been consummated, yet payments accrue to target firm shareholders during the earnout payment period.

The findings have several implications for future research on mergers and acquisitions as well as organizational governance. First, our results demonstrate that acquirers tailor their M&A deal structures based on whether the target firm is privately-held versus publicly-traded. Prior M&A studies tend to rely upon datasets that sample public companies or assume that findings for public firms extend to private firms. We highlight several important differences that exist across private and public firms, and the results also indicate the value of distinguishing these two classes of firms. Moreover, our results are in accord with recent descriptive findings showing that the incidence of acquisition increases once the firm has undertaken an IPO (e.g., Pagano, Panetta, & Zingales, 1998; Field & Mulherin, 1999). Thus, in broader terms, the relationship we
find between the public versus private status of the target and M&A deal structures is consistent with the notion that the operation of the equity market can shape the efficiency of the acquisition market.

Second, our findings are consistent with the argument that new ventures pose higher informational hazards than established targets and are therefore more likely to be acquired with contingent earnouts in order to respond to the risk of adverse selection. On a broad level, our findings therefore contribute to recent research that has investigated how entrepreneurial firms differ from other firms as well as the implications of these differences (e.g., Acs & Audretsch, 1987; Covin & Slevin, 1991; Shane, 1994). It is also worth noting that an additional potential benefit of using earnouts to acquire new ventures is the acquirer’s ability to retain target firm human capital and ensure its commitment to the business’ success during a transitional period (Kohers & Ang, 2000). Evidence in the M&A literature suggests that management departures in the target firm following an acquisition can lead to deteriorated performance (e.g., Cannella & Hambrick, 1993; Bergh, 2001). Thus, this feature of earnouts may be particularly attractive when bidders seek to acquire firms whose capabilities are largely tied to an entrepreneur’s idiosyncratic abilities. Future research that considers how M&A deal structures such as earnouts affect post-merger management issues would therefore be worthwhile.

Third, our findings show that firms are more likely to use earnouts in diversifying acquisitions in which the knowledge requirements of the industry entered differ from those of the firm’s core business. As we discuss, earnouts allow the firms to go forward
with the transaction, even if the parties hold very different expectations concerning the value of the assets to be purchased. However, it is also worth noting that there is an alternative explanation for our finding. Because earnouts require measurement of the target’s performance after the deal has been completed, parties will be able to implement earnouts more readily for acquisitions giving the target firm operational autonomy and find it problematic to use earnouts for absorption acquisitions and others involving high levels of structural integration (Haspeslagh & Jemison, 1991). Given that the level of structural integration is negatively related to the level of diversification (Datta & Grant, 1990), earnouts may be used less frequently in intra-industry transactions and more often when firms enter into new industries with different knowledge requirements because of this measurement issue rather than only due to problems of asymmetric information.

While our theoretical focus has been on *ex ante* transactional hazards, future studies with primary M&A data that explore the role of integration as well as various *ex post* contracting issues would also be valuable.

Finally, our study has emphasized the need to separate out contractual forms from organizational forms and has suggested that firms may be able to accomplish contractually what prior research has attributed to organizational governance choices. Specific to our empirical context, while previous literature has suggested that firms avoid mergers and acquisitions in favor of equity collaborations under conditions of information asymmetry, we show that firms can also use contingent earnouts in response to the risk of adverse selection. The results of the bivariate probit models indicate that contingent earnouts and partial acquisitions, particularly minority acquisitions, can offer
transacting parties substitute deal structures. Future studies on mergers and acquisitions as well as other organizational forms might distinguish different types of contractual and organizational remedies to various exchange hazards. This work could examine the antecedents of firms’ contractual and organizational governance choices and explore their interdependencies in different empirical domains.

Although a number of avenues for future research have already been noted above, extensions might address several limitations to the present study. Since our study relies upon secondary data for M&A deal structures, studies that survey firms to gather primary data would be valuable in order to obtain more fine-grained data on earnout provisions such as performance benchmarks, deferred payment schedules, allocations of fixed versus variable payments, forms of consideration, and so forth. Micro-level investigations of earnout contracts might also consider the issue of risk allocations from the acquirer to the target and explore the effects of risk preferences and incentives on the sell side (e.g., Allen & Lueck, 1999). The present analyses have relied upon reduced form models to investigate firms’ decisions regarding contractual and ownership designs for M&A, so our study is ultimately silent on the performance or other consequences of these deal structures. Studies that examine the financial and other implications of these choices would therefore be valuable. Given the broader opportunities that exist to investigate the contractual features underlying various corporate investments by firms (e.g., Poppo & Zenger, 2002), research in directions such as these would be valuable to understand better the design and functioning of contracts as well as the interplay between contractual and organizational forms.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Earnout</td>
<td>0.04</td>
<td>0.20</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Partial acquisition</td>
<td>0.07</td>
<td>0.26</td>
<td>-0.04 †</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Acquisition experience</td>
<td>1.48</td>
<td>0.96</td>
<td>-0.09 ***</td>
<td>0.001</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Acquirer leverage</td>
<td>2.29</td>
<td>4.90</td>
<td>-0.06 **</td>
<td>0.01</td>
<td>0.08 ***</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Acquirer size</td>
<td>6.00</td>
<td>2.33</td>
<td>-0.16 ***</td>
<td>0.17 ***</td>
<td>0.55 ***</td>
<td>0.25 ***</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Private target</td>
<td>0.60</td>
<td>0.49</td>
<td>0.13 ***</td>
<td>0.05 *</td>
<td>-0.17 ***</td>
<td>-0.08 ***</td>
<td>-0.26 ***</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>7. New venture</td>
<td>0.37</td>
<td>0.48</td>
<td>0.07 *</td>
<td>0.28 ***</td>
<td>-0.12 ***</td>
<td>-0.09 ***</td>
<td>-0.04 †</td>
<td>0.24 ***</td>
<td>---</td>
</tr>
<tr>
<td>8. Knowledge distance</td>
<td>27.87</td>
<td>30.91</td>
<td>0.05 *</td>
<td>0.17 ***</td>
<td>0.02</td>
<td>-0.05 †</td>
<td>0.01</td>
<td>0.04 †</td>
<td>0.11 ***</td>
</tr>
</tbody>
</table>

**TABLE 4.1**

*Descriptive Statistics and Correlation Matrix*

N=2058. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Full Sample (N=2058)</th>
<th>Earnouts and Cash Deals (N=903)</th>
<th>Earnouts and Stock Deals (N=1235)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1.06† (0.58)</td>
<td>-3.10*** (0.73)</td>
<td>-0.84 (0.80)</td>
</tr>
<tr>
<td></td>
<td>0.88 (0.65)</td>
<td>-0.84 (0.80)</td>
<td>-0.71 (0.62)</td>
</tr>
<tr>
<td></td>
<td>-2.99** (0.79)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition experience</td>
<td>-0.04 (0.16)</td>
<td>0.07 (0.16)</td>
<td>-0.44† (0.18)</td>
</tr>
<tr>
<td></td>
<td>-0.44† (0.18)</td>
<td>-0.18 (0.19)</td>
<td>0.09 (0.16)</td>
</tr>
<tr>
<td></td>
<td>0.11 (0.16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquirer leverage</td>
<td>-0.17† (0.10)</td>
<td>-0.18† (0.10)</td>
<td>-0.19† (0.11)</td>
</tr>
<tr>
<td></td>
<td>-0.19† (0.11)</td>
<td>-0.19† (0.11)</td>
<td>-0.16† (0.09)</td>
</tr>
<tr>
<td></td>
<td>-0.14 (0.09)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquirer size</td>
<td>-0.36*** (0.07)</td>
<td>-0.32*** (0.07)</td>
<td>-0.57*** (0.09)</td>
</tr>
<tr>
<td></td>
<td>-0.61*** (0.10)</td>
<td>-0.30*** (0.08)</td>
<td>-0.23*** (0.08)</td>
</tr>
<tr>
<td>Target industry fixed effects</td>
<td>17.26</td>
<td>19.68† (0.07)</td>
<td>10.56 (0.07)</td>
</tr>
<tr>
<td></td>
<td>10.56 (0.07)</td>
<td>20.78† (0.07)</td>
<td>13.66 (0.07)</td>
</tr>
<tr>
<td></td>
<td>18.06 (0.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>11.60</td>
<td>16.02† (0.07)</td>
<td>22.08** (0.07)</td>
</tr>
<tr>
<td></td>
<td>22.08** (0.07)</td>
<td>12.20† (0.07)</td>
<td>18.32† (0.07)</td>
</tr>
<tr>
<td></td>
<td>20.26** (0.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private target</td>
<td>---</td>
<td>1.68*** (0.41)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>1.97*** (0.45)</td>
<td>---</td>
<td>1.59*** (0.42)</td>
</tr>
<tr>
<td>New venture</td>
<td>---</td>
<td>0.62† (0.26)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>0.83** (0.32)</td>
<td>---</td>
<td>0.56 (0.26)</td>
</tr>
<tr>
<td>Knowledge distance</td>
<td>---</td>
<td>0.01† (0.00)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>0.20 (0.46)</td>
<td>---</td>
<td>0.95† (0.39)</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>91.32***</td>
<td>128.73***</td>
<td>152.22***</td>
</tr>
<tr>
<td></td>
<td>189.14***</td>
<td>70.09***</td>
<td>104.14***</td>
</tr>
<tr>
<td>Log Likelihood, $L(\beta)$</td>
<td>-302.13</td>
<td>-283.42</td>
<td>-201.06</td>
</tr>
<tr>
<td></td>
<td>-182.60</td>
<td>-269.20</td>
<td>-252.17</td>
</tr>
<tr>
<td>$-2[L(\beta_{\text{Reduced}})-L(\beta_{\text{Full}})] / \chi^2$</td>
<td>37.42***</td>
<td>36.92***</td>
<td>34.06***</td>
</tr>
</tbody>
</table>

**TABLE 4.2**

**Multivariate Estimation Results**

The dependent variable assumes the value of one if a contingent earnout was used, and zero otherwise. Standard errors appear in parentheses. † $p<0.10$, ‡ $p<0.05$, *** $p<0.01$, **** $p<0.001$.

*Cell values represent the chi-squared values of the test for joint significance of the fixed effects.*
### TABLE 4.3

#### Estimation Results from Bivariate Probit Models\(^d\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample (N=2058)</th>
<th>Earnouts and Cash Deals (N=903)</th>
<th>Earnouts and Stock Deals (N=1235)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.67(^*) (0.28)</td>
<td>-2.75(^*) (0.28)</td>
<td>-1.59(^*) (0.34)</td>
</tr>
<tr>
<td>Acquisition experience</td>
<td>0.03 (0.07)</td>
<td>-0.28 (0.08)</td>
<td>-0.18 (0.06)</td>
</tr>
<tr>
<td>Acquirer leverage</td>
<td>-0.07(^*) (0.04)</td>
<td>-0.01 (0.01)</td>
<td>-0.00 (0.01)</td>
</tr>
<tr>
<td>Acquirer size</td>
<td>-0.17(^*) (0.04)</td>
<td>0.22 (0.02)</td>
<td>-0.17 (0.03)</td>
</tr>
<tr>
<td>Target industry fixed effects(^e)</td>
<td>57.60(^***)</td>
<td>29.20(^***)</td>
<td>76.68(^***)</td>
</tr>
<tr>
<td>Year fixed effects(^e)</td>
<td>21.34(^**)</td>
<td>25.72(^***)</td>
<td>19.66(^**)</td>
</tr>
<tr>
<td>Private target</td>
<td>--</td>
<td>--</td>
<td>0.77(^*) (0.18)</td>
</tr>
<tr>
<td>New venture</td>
<td>--</td>
<td>--</td>
<td>0.31(^*) (0.13)</td>
</tr>
<tr>
<td>Knowledge distance (x10^{-2})</td>
<td>--</td>
<td>--</td>
<td>0.37(^*) (0.18)</td>
</tr>
<tr>
<td>Model (\chi^2)</td>
<td>182.93(^***)</td>
<td>287.10(^***)</td>
<td>201.64(^***)</td>
</tr>
<tr>
<td>Log Likelihood, (L(\beta_0))</td>
<td>-767.76</td>
<td>-674.55</td>
<td>-515.56</td>
</tr>
<tr>
<td>(-2[L(\beta_{reduced})-L(\beta_{full})]\sim \chi^2)</td>
<td>186.42(^*)</td>
<td>171.78(^***)</td>
<td>40.76 (^*)</td>
</tr>
<tr>
<td>(p)</td>
<td>-0.17</td>
<td>-0.29(^*)</td>
<td>-0.56(^*)</td>
</tr>
</tbody>
</table>

\(^d\) The dependent variable for the first equation assumes the value of one if a contingent earnout was used, and zero otherwise. For the second equation, the dependent variable assumes the value of one if the transaction was a partial acquisition, and zero if it was a full acquisition.

\(^e\) Standard errors appear in parentheses. \(^*\) p<0.10, \(^*\) p<0.05, \(^*\) p<0.01, \(^*\) p<0.001.

\(^e\) Cell values represent the chi-squared values of the test for joint significance of the fixed effects.
REFERENCES


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