BOARD CHARACTERISTICS AND THE ACQUISITION OF NEWLY PUBLIC FIRMS

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ABSTRACT

This study examines the relationship between board characteristics and the likelihood that newly public firms will be acquired. Drawing upon signaling and agency theory, this study considers the influence of various board characteristics in addressing the information asymmetry and agency issues faced by potential acquirers of newly public firms. In doing so, this study extends the focus of research on a unique form of entrepreneurial harvest, public dual tracking. In order to test study hypotheses, we conducted logistic regression on a sample of 175 newly public firms that underwent initial public offerings (IPO) in the U.S. during the calendar year of 2007. Study results provide moderate support for study hypotheses. First, no support was found for a relationship between the percentage of outside directors and the likelihood of newly public firms being acquired. Second, Chief Executive Officer (CEO) duality was found to be negatively related to the likelihood of a newly public firms being acquired. Third, opposite the hypothesized effect, study results suggest that the presence of women directors is negatively related to the likelihood that newly public firms are acquired. Finally, study results suggest a weak positive relationship between board size and the likelihood of newly public firms being acquired.

INTRODUCTION

Scholarly attention to the acquisition of firms that have completed their initial public offerings (IPOs), sometimes referred to as public dual-tracking, represents a growing area of interest to scholars in finance, management, and entrepreneurship (Brau, Sutton, & Hatch, 2010; Ragozzino & Reuer, 2007b). This attention is due, at least in part, to the relative frequency with which newly public firms (Arend, Patel, & Park, 2014; Garg, Li, & Shaw, 2018) are acquired by other firms upon completion of their IPOs (Brau, Francis, & Kohers, 2003; Pagano, Panetta, & Zingales, 1998) as well as the potential for such acquisitions to create wealth for newly public firm owners (Reuer, Tong, & Wu, 2012). Indeed, research on this topic suggests that this type of 'public-dual tracking', where firms go public and are then acquired by

another firm thereafter, represents a potentially lucrative form of entrepreneurial exit for founders and shareholders (Field & Karpoff, 2002; Zingales, 1995).

While the acquisition of a newly public firm provides founders and shareholders with an opportunity to create financial wealth (Brau et al., 2010), substantial challenges to the realization of such gains exist. For example, the relatively short track records of newly public firms serve to increase uncertainty surrounding their long-term viability (Certo, 2003; Fischer & Pollock, 2004). Difficulties associated with the valuation of newly public firm resources and growth prospects serve to further exacerbate the uncertainty faced by potential acquirers of newly public firms (Cooper, Woo, & Dunkelberg, 1988; Heeley, Matusik, & Jain, 2007). These challenges give rise to potentially high degrees of information asymmetry between newly public firms and their prospective acquirers, exposing potential acquirers to the hazards of adverse selection and moral hazard (Ragozzino & Reuer, 2007b; Reuer & Ragozzino, 2008). As a consequence of these challenges, prospective acquirers of newly public firms may choose not to proceed with what might otherwise represent seemingly attractive acquisitions (Ragozzino, 2016).

Relatively little is known about what factors lead firms to be acquired after their IPOs. Extant research often draws upon the logic of signaling theory (Arrow, 1973; Spence, 1981), to argue that when faced with the uncertainty presented by evaluating newly public firms as potential acquisition targets, prospective acquirers of newly public firms screen potential acquisition targets based upon indicators of firm viability (Ragozzino & Reuer, 2007a, 2007b). Tests of the insights provided by signaling theory have proven fruitful in furthering our understanding of which firm characteristics are salient to prospective acquirers of newly public firms. For example, research suggests that affiliations with venture capitalists, prestigious underwriters, as well as IPO performance represent signals of newly public firm quality that prospective acquirers value (Ragozzino & Reuer, 2007a).

While the focus of research on the role played by such external affiliations and endorsements has contributed to our understanding of the evaluative processes undertaken by potential acquirers of newly public firms, ample room exists for extending research in this vein. For example, relatively little is known about the role played by boards of directors in shaping the likelihood that newly public firms will be acquired. In conducting this study we extend extant research in multiple ways. First, we shift the focus of research on the acquisition of newly public firms from the effects of external affiliations and endorsements towards indicators of internal agency conditions occurring within newly public firms as reflected by their boards of directors. While the findings of management research identify the role of external

endorsements such as venture capital (VC) backing, underwriter reputation, and IPO performance in addressing the information asymmetry problems faced by prospective acquirers of newly public firms, (e.g. Ragozzino, 2016; Ragozzino & Reuer, 2007a), they do so without acknowledging the issues related to managerial control suggested by agency theory that may shape the acquisition prospects of newly public firms. In doing so, they ignore the potential for internal agency conditions to shape the supply of suitable newly public firms in acquisition markets. Second, this study extends research on the influence of boards of directors by considering the influence of multiple board characteristics on the likelihood of newly public firms being acquired. In doing so we add to the list of organizational outcomes shaped by board of director structure and composition. Finally, this study extends entrepreneurship research on the role of adverse selection and agency conditions in shaping firm ability to obtain access to financial resources from external stakeholders. The results of this study provide insights to entrepreneurs seeking to harvest their firms through public dual tracking with respect to staffing and structuring their boards of directors.

The central proposition of this study is that board characteristics convey information regarding the agency conditions within newly public firms, and as such, provide insight into how managers are likely to respond to the prospect of being acquired, and in doing so, shape prospective acquirer perceptions of newly public firm suitability as an acquisition target. Our focus on boards of directors allows us to examine the potential role played by board characteristics in addressing two main problems faced by prospective newly public firm acquirers; acquisition target valuation and acquisition deal execution. Towards this end, we integrate agency theory (Eisenhardt, 1989; Jensen & Meckling, 1976) with signaling theory (Arrow, 1973; Spence, 1981) to highlight the role played by boards of directors in indicating the nature of internal agency conditions to potential acquirers, thereby reducing two potential sources of uncertainty, namely target firm managerial opportunism and adverse selection. As a consequence, this study provides insight into the question of whether boards of directors influence the screening process engaged in by prospective acquirers of newly public firms.

The remainder of this study proceeds as follows. First, we discuss extant research on the role of internal agency conditions in shaping the acquisition prospects of newly public firms. We then discuss the role of boards of directors as signals of the nature of agency conditions within newly public firms. Next, we develop hypotheses regarding the influence of four specific board characteristics that may convey information regarding the nature of agency conditions within a given newly public firm. Subsequently, we provide a discussion of our research

methodology and empirical results of hypotheses tests. We conclude by discussing the contributions of study findings to existing research and identify potential paths for building upon this work.

LITERATURE REVIEW

Research on the role of agency conditions in shaping the likelihood of newly public firm acquisition has largely taken place in the field of finance. Drawing upon agency theory, finance scholars consider the potential private benefits that owners and managers may extract through the enactment or prevention of post-IPO acquisitions. Studies in this vein argue that the acquisition of newly public firms represents a potential threat to the private wealth of newly public firm managers, whose earnings prospects and job tenures are potentially reduced upon completion of such an acquisition (e.g. Brau et al., 2003; Field & Karpoff, 2002). Viewed in this way, the acquisition of newly public firms is thought to create potential conflicts of interest between newly public firm managers and shareholders, which may lead to managerial opportunism (Brennan & Franks, 1997). While empirical tests of this logic remains limited, some support for this view that internal agency conditions influence the likelihood of newly public firm acquisition can be seen in the research of Field and Karpoff (2002), who found that the presence of anti-takeover defenses in newly public firms reduces the likelihood of such takeovers.

In contrast to the field of finance's focus on the role of internal agency conditions shaping post-IPO acquisition outcomes, research within the field of management has largely focused on the influence of external affiliations and endorsements in shaping the likelihood that a newly public firm will be acquired. These studies emphasize the fact that prospective acquirers of newly public firms are motivated by the potential to gain access to innovative technological resources and/or opportunities for growth (Ragozzino & Reuer, 2007b; Reuer & Ragozzino, 2008). Although such opportunities do exist in the market for newly public firm acquisitions (Reuer et al., 2012), the acquisition market for newly public firms is also rife with uncertainty due to the often limited operating histories of newly public firms (Pollock, Fischer, & Wade, 2002; Stuart, Hoang, & Hybels, 1999). Given the high degree of uncertainty surrounding newly public firms, there exists a high potential for adverse selection on the part of prospective acquirers of newly public firms arising from the high degree of information asymmetry between newly public firms and prospective acquirers (Ragozzino & Reuer, 2011).

These disparities in information create at least two difficulties for prospective acquirers of newly public firms. First, would be acquirers of newly public firms face

difficulty in determining which newly public firms represent viable acquisition targets with respect to the resources that the newly public firms possess (Heeley et al., 2007; Reuer & Ragozzino, 2008). This is due in part to the fact that information about newly public firm human resources, production technologies, brand capital, growth opportunities, and social capital with other firms and customers is often unknown by both buyers and sellers given their relatively short track records (Ragozzino & Reuer, 2011). Second, newly public firm managers and owners have incentives to inflate the value of the firm in order to achieve private gains upon completion of the acquisition (R. J. Gilson & Schwartz, 2005). As a consequence, newly public firms often suffer from a liability of market newness when disclosing information about their value, even if they are completely forthcoming and abstain from opportunistic behavior during the deal making process (Certo, 2003; Ravenscraft & Scherer, 1987)

As a consequence of these difficulties, management scholars typically argue that prospective acquirers of newly public firms are exposed to the risks of paying too much for the newly public firms they target for acquisition (Reuer et al., 2012) as well as acquiring newly public firms that do not make strategic sense (Ragozzino & Reuer, 2011). This, in turn, results in prospective acquirers of newly public firms discounting their offer prices, thereby reducing the likelihood that the parties to a potential acquisition transaction agree upon terms of a deal (Ragozzino & Reuer, 2007a, 2007b). In effect, the risks of adverse selection due to the information asymmetries between acquirers and newly public acquisition targets increases the transaction costs associated with post-IPO acquisitions, and in turn, reduces the attractiveness of acquisition targets to potential acquirers (Milgrom & Stokey, 1982; Puranam, Powell, & Singh, 2006).

Drawing upon signaling theory (Arrow, 1973; Spence, 1981), management scholars have begun to explore the role played by various indications of firm quality in remedying the information asymmetry surrounding newly public firms and its corresponding adverse selection problem in post-IPO acquisition markets. Generally, when employing signaling theory logic, management researchers posit that in order to reduce the likelihood of adverse selection, prospective acquirers of newly public firms engage in a search for indicators of newly public firm quality to filter them (Ragozzino & Reuer, 2011; Reuer & Ragozzino, 2008). Signaling theory logic suggests that newly public firms found in possession of characteristics that indicate their higher quality are thought to represent more attractive acquisition targets to prospective acquirers, and as a result, are more likely to be acquired than firms not found in possession of such characteristics. Consistent with this view, research has found that indicators of newly public firm quality, such as external affiliations

(venture capital backing and underwriter reputation) as well as market endorsements (IPO performance) increase the likelihood of newly public firms being acquired (Ragozzino & Reuer, 2007a).

While prior research from the fields of both finance and management has enhanced our understanding of the factors which shape the likelihood of newly public firm acquisition, scholars have paid little attention to the role played by boards of directors in newly public firms. We find the paucity of research in linking boards to the acquisition prospects of newly public firms surprising for two reasons. First, research on IPO performance suggests that board characteristics play a key role in shaping external stakeholder perceptions of newly public firms both during (Bruton, Filatotchev, Chahine, & Wright, 2010; Chahine & Filatotchev, 2008; Reutzel & Belsito, 2012) and after IPOs (Chancharat, Krishnamurti, & Tian, 2012; Kroll, Walters, & Le, 2007). As rather visible indicators of the nature of agency conditions within a given firm, board characteristics have been found to signal firm quality (Certo, Daily, & Dalton, 2001b; Chahine & Filatotchev, 2008). Second, extant research suggests that the nature of agency conditions within a firm may shape that firm's acquisition prospects (Boone & Mulherin, 2017; Field & Karpoff, 2002). Given the prominent role boards play in both shaping agency conditions within a firm (Eisenhardt, 1989; Jensen & Meckling, 1976), as well as signaling the nature of agency conditions within newly public firms (Certo et al., 2001b; Filatotchev & Bishop, 2002), an investigation of how newly public firm board characteristics influence the likelihood of being acquired represents a natural extension of extant research. In doing so, this study also heeds calls for greater research on the acquisition patterns of firms undergoing the IPO transition (Certo, Holmes, & Holcomb, 2009).

Drawing upon the insights of prior research on boards of directors, IPOs, and acquisition markets, we identify four board characteristics which we argue may influence potential acquirer perceptions of newly public firm agency conditions and attractiveness as an acquisition target. These board characteristics are the ratio of outside to inside directors serving on the board, CEO duality, board size, and female presence on the board. We focus on each of these board characteristics as a result of their potential to provide insight into board ability to monitor firm managers (Campbell & Minguez-Vera, 2008; Certo et al., 2001b; Chahine & Filatotchev, 2008; Dalton, Daily, Ellstrand, & Johnson, 1998; Dalton, Daily, Johnson, & Ellstrand, 1999; Filatotchev & Bishop, 2002; Reutzel & Belsito, 2015). Our central thesis is that each of these board characteristics signal a given boards' ability to monitor managers. In doing so, these board characteristics shape the attractiveness of newly public firms to prospective acquirers as a result of the information they provide regarding the

managerial opportunism and adverse selection problems faced by acquirers of newly public firms (D'Aveni & Kesner, 1993; Davis, 1991). In the following sections we expand this logic in the development of research hypotheses.

SIGNALING MANAGERIAL MONITORING

Managers of acquisition target firms may have incentive to inflate value of their firms by selectively disclosing positive information and withholding negative information regarding firm performance and prospects for future growth (D'Aveni & Kesner, 1993; Field & Karpoff, 2002). Target firm managers may also have an incentive to maintain the private benefits associated with corporate control that continue as long as their firms are not acquired (Brennan & Franks, 1997). As a result of these incentives, absent effective managerial monitoring, newly public firm managers may thwart the acquisition attempts of prospective acquirers by enacting various forms of takeover defense, resulting in higher acquisition premiums paid by acquirers as well as complicating the integration of acquired newly public firms (Field & Karpoff, 2002). Such forms of managerial opportunism enacted by acquisition target firm management represent sources of adverse selection due to their potential to reduce the value that prospective acquirers realize through the acquisitions that they undertake (Ragozzino & Reuer, 2007a; Reuer et al., 2012).

Monitoring managerial actions represents a central role of boards of directors (Mizruchi, 1983; Walsh & Seward, 1990). In doing so, boards are thought to mitigate the agency problems stemming from the conflicting interests of managers and shareholders which give rise to various forms of managerial opportunism (Fama, 1980; Jensen, 1986). Drawing upon this logic, corporate governance scholars commonly argue that the ability of boards of directors to effectively monitor managers represents a key indicator of their effectiveness (Hermalin & Weisbach, 1998; John & Senbet, 1998; Tuggle, Sirmon, Reutzel, & Bierman, 2010).

Research on boards of directors suggests that board characteristics influence their ability to effectively monitor managers (Finkelstein, Hambrick, & Cannella, 2009). For example, the ratio of outside directors to inside directors on the board (Brickley, Coles, & Terry, 1994; Byrd & Hickman, 1992), board leadership structure (Krause, Semadeni, & Cannella, 2014; Tuggle et al., 2010), and board size (Coles, Daniel, & Naveen, 2008; Eisenberg, Sundgren, & Wells, 1998) have all been linked to board ability to monitor managers. Research also suggests that the presence of women directors on boards may also enhance board monitoring of management (Campbell & Minguez-Vera, 2008; Dailey & Dalton, 2003).

Further examination of research on boards of directors also suggests that external stakeholder perceptions of board ability to monitor managers contributes to newly public firm legitimacy and shapes a variety of organizational outcomes (Certo et al., 2009; Connelly, Ireland, Certo, & Reutzel, 2011). Evidence of this can be seen in research which suggests that the percentage of outside directors (Chahine & Filatotchev, 2008; Filatotchev & Bishop, 2002), board leadership structure (Chahine & Tohme, 2009), board size (Carter & Frederick, 1998; Certo et al., 2001b) and the presence of women on the board (Nelson & Levesque, 2007; Reutzel & Belsito, 2015) influence equity market perceptions of newly public firms' viability.

Drawing upon prior research linking board characteristics to board ability to monitor managers as well as research on external stakeholder perceptions of newly public firm quality, we posit that the aforementioned board characteristics may shape the likelihood of newly public firms being acquired. Specifically, we posit that board characteristics that indicate board ability to monitor managers, signal a reduced potential for managerial opportunism to prospective acquirers of newly public firms. In doing so, such board characteristics may increase the likelihood that newly public firms are acquired. In the sections that follow we draw upon this logic to develop hypotheses for the following board characteristics: percentage of outside directors serving on the board, CEO-duality, the presence of women directors on the board, and board size. Each of these board characteristics were selected because extant research suggests that they shape firm ability to monitor top management.

Percentage Outside Directors

Outside directors serving on a firm's board shape that board's ability to monitor management (Jensen & Meckling, 1976; Walsh & Seward, 1990). Consistent with this view, research suggests that the percentage of outside directors serving on a given board represents an indicator of board ability to monitor management to external stakeholders. For example, research suggests that the percentage of outside directors increases the capital received by IPO firms (Chahine & Filatotchev, 2008; Sanders & Boivie, 2004). Studies in this vein argue that the percentage of outside directors serves as a proxy for the quality of managerial monitoring conducted by the boards. Extending this logic to the market for post-IPO acquisitions suggests that the percentage of outside directors serving on a given firm's board may convey information regarding the quality of managerial monitoring taking place within a newly public firm to prospective acquirers. Such an indicator of effective managerial monitoring may reduce prospective acquirer concerns regarding target

firm managerial opportunism which give rise to the adverse selection problem that prospective acquirers face. As such, we hypothesize the following:

Hypothesis 1: *The percentage of outside directors serving on a newly public firm's board is positively related to the likelihood that a newly public firm will be acquired.*

CEO Duality

Research also suggests that CEO duality, instances in which one individual holds both the CEO and chairperson of the board titles, weakens managerial monitoring by the board of directors (Krause et al., 2014). Studies suggest that CEO duality provides managers with influence over the board's attention and ability to monitor managers, resulting in lower levels of managerial monitoring behaviors engaged in by boards (Tuggle et al., 2010). Consistent with this view, research also finds that CEO duality signals a lack of managerial monitoring to external stakeholders. For example research suggests that investors react negatively to the combination of the CEO and board chair titles (Dahya, Lonie, & Power, 1996; Worrell, Nemec, & Davidson, 1997). Extending this logic to post-IPO acquisition markets suggests that CEO duality may convey a lack of managerial monitoring to prospective acquirers of newly public firms. Such a signal of managerial monitoring issues may increase prospective acquirer concerns regarding target firm managerial opportunism and adverse selection. As such, we hypothesize the following:

Hypothesis 2: *CEO duality is negatively related to the likelihood that a newly public firm will be acquired.*

Women On The Board

Research also suggests that women serving as directors may increase the quality of managerial monitoring conducted by boards of directors. Support for this view can be found in research which suggests that gender diversity increases the amount of effort that boards allocate to monitoring management (Adams & Ferreira, 2009). Further support for this notion can be found in research suggesting that the presence of women directors in the boardroom reduces the likelihood of rubber-stamping managerial decision making by boards of directors (Huse & Solberg, 2006). Additional support for the notion that women on the board enhance the ability of boards to monitor managers is provided by research suggesting that boards with women directors exhibit greater degrees of strategic control, more collaboration

within the board room, and engage in greater amounts of development activities than those without women directors (Nielsen & Huse, 2010). Finally, research suggests that boards with at least one women serving as a director exhibit a lower likelihood of restating their financial statements than those without women directors (Abbott, Parker, & Presley, 2012).

Research also suggests that the presence of women on the board provides insights to external stakeholder regarding the quality of managerial monitoring taking place within a given firm. For example, the popular press in the U.S. increasingly calls for greater gender diversity in the boardroom (Hillman, Shropshire, & Cannella, 2007). Research also suggests that investors react positively to the appointment of women directors (Kang, Ding, & Charoenwong, 2010) and that investor reactions to women directors in IPO firms are increasingly positive over time (Reutzel & Belsito, 2015).

Drawing upon these findings, we suggest that the presence or absence of women on the board may be interpreted as an indicator of managerial monitoring quality by prospective acquirers of newly public firms. As a result, we expect women directors on the board to increase the attractiveness of a newly public firm to prospective acquirers to the extent that their presence signals board ability to monitor management thereby reducing the prospective acquirer's concern regarding target firm managerial opportunism and adverse selection. As a consequence, we hypothesize the following:

Hypothesis 3: *The presence of women directors serving on a newly public firm's board is positively related to the likelihood that a newly public firm will be acquired.*

Board Size

Board size may also shape the quality of managerial monitoring conducted by boards of directors. Research on this topic often argues that larger boards possess greater capability to monitor firm managers (Alexander, Fennell, & Halpern, 1993), particularly when managerial monitoring is taking place within small and medium sized enterprises, such as those undertaking their IPOs (Dalton et al., 1999). While research does suggest that excessively large boards can result in director free-riding issues (Pearce & Zahra, 1992; Raheja, 2005), newly public firm boards generally do not approach such extremes given their relative youth and small size (Certo et al., 2001b; Daily & Dalton, 1993). The effect of board size on managerial monitoring in such firms is thought to arise from the fact that as boards increase in size they typically add outside directors, who possess greater motivation and ability to monitor

managers (Shleifer & Vishny, 1997; Walsh & Seward, 1990). Indeed, before being willing to serve as an outside director, individuals are thought to evaluate the relative quality of the firm and its managers in order to minimize the potential risk they face (Fama & Jensen, 1983), as affiliation with failed firms can reduce future opportunities to serve as a director on other boards (S. C. Gilson, 1989). Additionally, research suggests that larger boards require greater compromise in order to reach consensus, and as such, the decisions of larger boards tend to be less extreme than those of smaller boards, resulting in less variability in firm performance (Cheng, 2008).

Drawing upon this logic, research argues that board size may serve as an indicator of managerial monitoring quality to post-IPO external stakeholders. Support for this notion can be found in research by Certo and colleagues (2001b) which finds that board size is negatively related to IPO underpricing. Extending this logic to the market for post-IPO acquisitions suggests that board size may serve as a signal of board monitoring quality to prospective acquirers of newly public firms. As such, board size may reduce prospective acquirer's concern regarding target firm managerial opportunism and adverse selection. As a result, we hypothesize the following:

Hypothesis 4: *Board size is positively related to the likelihood that a newly public firm will be acquired.*

SAMPLE

We test our hypotheses on a sample of U.S. firms that made initial public offerings during the calendar year of 2007. We selected IPO firms as the subject of this study for three main reasons. First, firm harvest through acquisition represents a commonly stated reason for undertaking the IPO process (Brau & Fawcett, 2006; Brau et al., 2003). Second, IPOs represent a transformational event in the development of a firm (Fischer & Pollock, 2004). This event often requires firm managers and investors to evaluate the composition and structure of their boards at the time of the IPO (Chancharat et al., 2012; Kroll et al., 2007) Board staffing at the time of a firm's IPO represents a decision which may have an enduring effect on post-IPO outcomes (Fischer and Pollock, 2004). Third, sampling IPO firms facilitates the comparison of this study's results with those of prior research on the effects of prior studies on the acquisition of newly public firms (e.g. Field & Karpoff, 2002; Ragozzino & Reuer, 2007a).

We selected IPOs from 2007 for multiple reasons. This calendar year was relatively active with respect to IPO activity. As such, this sample time frame provided a sample size large enough to achieve the statistical power requisite to

conduct hypotheses tests while simultaneously controlling for IPO market conditions that might influence observed board effects on the likelihood of newly public firm acquisition. Utilizing a cohort of IPO firms from the 2007 calendar year also allowed for the collection of post-IPO firm acquisition data when we initiated this study.

We drew our base sample for this study from the Securities Data Corporation Global New Issues (SDC) database. We eliminated firms from our final sample using the following criteria. First, IPO firms were required to make their equity offerings on publicly traded markets (i.e., NASDAQ, NYSE, and AMEX) for the first time. Second, sample firms were required to be headquartered in the U.S. at the time of their IPO. We imposed this criterion in order to control for potential cultural and institutional differences between firms that are beyond the scope of this study. Third, and in line with prior IPO research (Ritter, 1991), we excluded firms that were classified as any of the following: corporate spin-offs, unit issues, mutual to stock conversions, real estate investment trusts, or leveraged buyouts. Subjecting our initial sample to the above criteria and after eliminating firms for which data were unavailable, we were left with a final sample of 175 newly public firms.

MEASURES

Dependent Variable

Consistent with prior research, our dependent variable was coded based upon CRSP delisting codes during the three year windows following each sample firm's IPO (Field & Karpoff, 2002). We choose a three year post-IPO window for two main reasons. First, our theoretical and empirical focus is on newly public firms, rather than more established publicly traded firms. As a consequence, relying upon a time window longer than three years weakens our claim that we are studying firms that are newly public which are subject to the liability of market newness (Certo, 2003; Fischer & Pollock, 2004). Second, prior research on the acquisition of newly public firms generally relies upon independent and control variables that are measured at the time of a firm's IPO such as underwriter reputation, venture capital backing, IPO performance, etc. The effects of these IPO related measures are time invariant, and as such, are likely to weaken in their effects as newly public firms establish records of performance in publicly traded markets (Certo, 2003; Fischer & Pollock, 2004). Utilizing delisting codes provided by CRSP, we created our dependent variable, *acquisition of newly public firm,* by coding sample firms that were acquired during the three year period following their IPOs as 1, and 0 if they were not acquired during the three year window following their IPO.

Independent Variables

We utilized information from sample firm IPO prospectuses in order to construct the measures of the board level characteristics necessary to test our hypotheses. Consistent with prior research (Sanders & Boivie, 2004; Weisbach, 1988), we constructed a measure of the *percentage of outside directors* by dividing the number of outside directors by the total number of directors on a given sample firm's board. Also consistent with prior research on board leadership structure and monitoring (Certo, 2003; Tuggle et al., 2010), we coded *CEO duality* as (1) when the roles of CEO and chairperson were combined and (0) when separated. We created a measure of women's service on the board of directors, *number of women directors,* by summing the number of women directors serving on a sample firm's board (Adams & Ferreira, 2009). Consistent with prior research (Reutzel & Belsito, 2015), we identified women directors based on their name and the use of gender specific terms in the director biographies provided in sample firm IPO prospectuses. We operationalized *board size* by counting the number of directors on each IPO firm board (Cheng, 2008; Dalton et al., 1999). We calculated the logarithm of this variable to in order to correct for skewness.

Control Variables

In addition to our explanatory variables, we also controlled for several other factors that might shape the likelihood of newly public firms being acquired. Because motivations to go public can vary, we controlled for newly public *firm growth intentions* by calculating the rate of revenue growth during the first fiscal year immediately following the IPO event. Firms who have gone public in order to fuel future growth may not view acquisition as a desirable harvest strategy. In order to control for the effect of firm performance on firm acquisition prospects, we calculated each sample firm's ROA at the time of the IPO using data from Compustat and the IPO prospectus. We transformed this variable by taking its natural logarithm in order to address skewness issues.

We also controlled for IPO *risk factors* by summing the total number of risks factors identified by prior IPO studies (Cyr, Johnson, & Welbourne, 2000). In order to correct for skewness, the data collected for this variable was transformed by calculating the natural logarithm. We also controlled for *firm size* by identifying the number of individuals employed by each sample firm. This variable was constructed by coding the number of firm employees listed in the IPO prospectus of each sample firm. We then calculated the logarithm of that value to correct variable skewness.

Prior research suggests that as firms progress through their life cycles they become more complex, thereby influencing board characteristics (Lynall, Golden, & Hillman, 2003). Accordingly, we controlled for *firm age* by taking the natural log of the number of years passed since the date of incorporation provided in the IPO prospectus. Because firms operating in high technology industries are commonly targeted for acquisition (Desyllas & Hughes, 2008) we created a control measure based upon whether a firm operates in a *high technology* industry (1) or not (0) (Certo et al., 2001b; Daily, Certo, & Dalton, 2005). This measure was based upon primary Standard Industrial Classification (SIC) codes identified as high technology sectors and was accessed through SDC's new issues database.

Prior research suggests potential links between venture capital backing, underwriter prestige, IPO performance, and the likelihood that a newly public firm will be acquired. As such, we controlled for *venture capital* backing with a dummy variable indicating whether a firm was VC backed (1) at the time of its IPO or not (0). We also controlled for *underwriter prestige* by utilizing the widely used (Ritter & Welch, 2002) Carter-Manaster measure of underwriter prestige (Carter, Dark, & Singh, 1998; Carter & Manaster, 1990). IPO proceeds represent the financial capital accumulated as a result of the IPO. Firms that garner greater IPO proceeds are better equipped to expand and grow (Jain & Kini, 2000). We controlled for *IPO proceeds* by calculating the natural logarithm of the product of shares offered and the share price at the end of a firm's first day of trading. Finally, we controlled for *IPO underpricing* by taking the percentage change in stock price between the initial price set for the stock and the closing price of the stock on the first day of trading (Certo, Covin, Daily, & Dalton, 2001a). We collected the data on IPO underpricing from SDC.

ANALYSIS AND RESULTS

Table 1 presents the means, standard deviations, and correlations of all study variables. Consistent with prior research examining post-IPO firm level outcomes (Aruğaslan, Cook, & Kieschnick, 2004; Cyr et al., 2000; Field & Karpoff, 2002), and due to the cross-sectional and dichotomous nature of our dependent variable (Long & Freese, 2003), we utilized logistic regression to test the hypotheses developed in this study. The absence of multi-collinearity represents a key assumption of logistic regression. In order to ensure that sample data met this assumption, we examined the variance inflation factors (VIFs) for study variables independently and jointly. All VIFs were within acceptable ranges (Cohen, Cohen, West, & Aiken, 2003), suggesting that multi-collinearity assumptions were met for our sample data.

Table 1

#	Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Means, Standard Deviations, and Correlations[a]																	
1	Acquisition of Newly Public Firm	0.223	0.147														
2	% Outside Directors	0.762	0.131	0.068													
3	CEO Duality	0.480	0.501	-0.157	-0.263												
4	# of Women Directors	0.463	0.701	-0.099	0.079	-0.145											
5	Board Size	2.108	0.226	0.091	0.152	-0.004	0.203										
6	Firm Growth Intentions	0.460	1.289	-0.113	-0.026	0.073	-0.041	-0.045									
7	ROA	11.071	1.215	0.044	0.006	0.066	0.042	-0.058	0.005								
8	IPO Risk Factors	1.725	0.343	0.161	0.129	-0.037	-0.006	0.010	0.118	-0.025							
9	Firm Size	5.751	1.539	0.017	0.010	0.048	0.141	0.192	-0.150	0.018	0.021						
10	Firm Age	2.282	0.891	0.040	0.129	0.058	-0.087	0.107	-0.234	-0.045	-0.037	0.238					
11	High Technology	0.531	0.500	0.173	0.110	0.077	-0.017	-0.053	-0.023	0.066	0.294	0.071	-0.111				
12	Venture Capital	0.331	0.472	0.119	0.064	0.101	0.037	0.034	0.042	0.045	0.379	0.017	-0.047	0.467			
13	Underwriter Prestige	8.104	1.605	0.086	0.106	0.031	0.106	0.153	0.079	-0.042	0.175	0.167	-0.184	0.075	0.198		
14	IPO Proceeds	18.871	0.992	-0.128	-0.088	0.073	0.074	0.183	0.018	0.026	0.080	0.350	-0.093	-0.288	-0.159	0.524	
15	IPO Underpricing	0.108	0.257	-0.008	-0.062	-0.013	0.073	0.053	0.004	0.030	0.136	-0.010	-0.047	-0.025	0.055	0.187	0.353

a correlations greater than |.152| are statistically significant at p<.05

The results of tests of study hypotheses are presented in Table 2. Model 1 includes the control variables suggested by prior research. The results presented in Model 1 provide some support for the influence of variables suggested by prior research on the acquisition of newly public firms. Specifically, consistent with prior research (Ragozzino & Reuer, 2007a) we find that *underwriter prestige* positively influences the likelihood of a newly public firm being acquired. We also find statistical support for the inclusion of additional control variables in Model 1. For example, *IPO proceeds* appears to negatively influence the likelihood of a newly public firm being acquired. The results of Model 1 also suggest that *firm growth intentions* are negatively related to the likelihood that a newly public firm will be acquired. Finally, *IPO risk factors* appear to be positively related to the likelihood that a newly public firm will be acquired.

Model 2 presents the result of tests of Hypotheses 1-4. The coefficient for *percentage outside directors* is not statistically significant. As a consequence Model 2 provides no support for Hypothesis 1 regarding the influence of the percentage of the board occupied by outside directors on the likelihood of newly public firms being acquired. The coefficient for *CEO duality* is both negative and statistically significant ($p<.05$). This result supports Hypothesis 2 regarding the negative influence of CEO duality on the likelihood of a newly public firm being acquired. Hypothesis 3, which suggested a positive relationship between the number of women on the board of directors and the likelihood of newly public firm acquisition, was not supported. This is evidenced by the negative and statistically significant ($p<.05$) coefficient for *number of women directors* in Model 2. Finally, the coefficient for *board size* shown in Model 2 is positive and weakly statistically significant ($p<.10$), thereby providing weak support for Hypothesis 4 regarding the influence of the number of directors serving on a newly public firm's board and the likelihood it will be acquired.

Table 2
Logistic Regression - Acquisition of Newly Public Firms

Variable	Model 1		Model 2	
Intercept	-1.055		1.756	
Firm Growth Intentions	-1.040	*	-0.930	*
ROA	0.854		0.451	
IPO Risk Factors	1.605	*	1.574	*
Firm Size	0.092		0.087	
Firm Age	-0.020		0.088	
High Technology	0.243		0.508	
Venture Capital	-0.297		-0.130	
Underwriter Prestige	0.474	*	0.500	*
IPO Proceeds	-0.890	*	-0.907	*
IPO Underpricing	0.457		0.369	
% Outside Directors			-1.588	
CEO Duality			-1.215	*
# of Women Directors			-0.794	*
Board Size			1.629	^
Pseudo R^2	0.133		0.196	^
x^2	24.760	**	36.400	***

*n=175;^ p<.10; * p<.05; ** p<.01; *** p<.001*

DISCUSSION

This study examines the influence of board characteristics on the likelihood that newly public firms are acquired. In doing so, this study also heeds calls for greater research on the acquisition of firms undergoing the IPO transition (Certo et al., 2009) filling an empirical gap in extant research on the acquisitions of newly public firms and providing insight into how newly public firms should staff their boards of directors if their desire is to be acquired. Drawing upon research from finance and management we hypothesized that the percentage of outside directors, CEO duality, women directors, and board size all influence a newly public firm's likelihood of being acquired. Taken collectively, the results of this study provide support for the role of newly public firm board characteristics in shaping a unique and potentially lucrative form of entrepreneurial exit. The results of this study provide insights into the question

of whether board characteristics of newly public firms influence the screening process engaged in by prospective acquirers of newly public firms.

Our first hypothesis suggested a positive relationship between the percentage of outside directors and the likelihood of newly public firm acquisition. We did not find support for our first hypothesis, as study results did not find a statistically significant relationship, either positive or negative, between the percentage of outside directors and the likelihood of newly public firm acquisitions. The absence of a statistically significant influence of the percentage of outside directors and newly public firm acquisition likelihood, is similar to the pattern of mixed findings exhibited by research examining the impact of the percentage of outside directors serving on a firm's board and other organizational outcomes (Dalton, Daily, Certo, & Roengpitya, 2003; Finkelstein et al., 2009).

We found a negative relationship between CEO duality and the likelihood of newly public firm acquisition. This finding adds to research on the organizational consequences of CEO duality by linking CEO duality to an organizational outcome that prior research has not considered. Furthermore, this finding lends support to the agency and signaling theory-based logic relied upon to theoretically ground this study. Specifically, study findings suggest that CEO duality is viewed as a potential indicator of agency problems by prospective acquirers of newly public firms.

The finding of a negative relationship between the number of women serving on the board of directors and the likelihood of newly public firm acquisition was surprisingly opposite the relationship suggested by our hypothesis. Although the findings of multiple studies suggest that women have made progress in the boardroom in the eyes of a variety of stakeholders (Dailey & Dalton, 2003; Reutzel & Belsito, 2015), this study's finding may suggest that that prospective acquirers adhere to gender stereotypes (Ryan, Haslam, Hersby, & Bongiomo, 2011) which stigmatize (Devers, Dewett, Mishina, & Belsito, 2009) women directors with respect to ability to monitor top managers. This finding extends research on stakeholder reactions to women in roles historically held by men by linking women directors to the reaction of a unique stakeholder group, prospective acquirers of newly public firms, which prior research has heretofore not examined.

Finally, we found weak support for our final hypothesis, which suggested a positive relationship between board size and the likelihood of newly public acquisition. We emphasize that, while weak, statistically speaking, this finding provides additional support for the notion that board size may convey information to external stakeholders regarding board managerial monitoring capability. As such, this finding extends research on the effects of board size by linking board size to an

organizational outcome, the acquisition prospects of newly public firms that prior research has not considered.

As a potentially lucrative form of entrepreneurial harvest, the acquisition of newly public firms represents both a practically and theoretically interesting phenomena that has received relatively little attention in extant research (Brau et al., 2003; Brau et al., 2010). This study represents the first to focus primarily on the characteristics of newly public firm boards in shaping their prospects in acquisition markets. This study highlights the role played by the board of directors in ameliorating potential acquirer concerns regarding agency conditions within newly public acquisition targets. Prior research has largely focused on the role of external endorsements in addressing the adverse selection problem faced by prospective acquirers of newly public firms. In this study, we integrate the logic from both signaling and agency theories to highlight the signaling role played by boards of directors in newly public firms. In doing so, this study demonstrates the benefits of integrating multiple theoretical perspectives to examine the acquisition of newly public firms.

LIMITATIONS AND FUTURE RESEARCH

While this study extends existing research in multiple ways, it is not without its limitations. First, this study does not consider the role of other governance mechanisms which may shape the likelihood of newly public firm acquisitions, such as executive compensation and ownership. Future research might provide valuable insights into how such alternative governance mechanisms exacerbate, or mitigate, the impact of board characteristics on the likelihood of newly public firm acquisition.

Second, due to the cross sectional nature of the data, this study does not consider how board characteristics and the likelihood of newly public firm acquisition evolve over time. Future research might also consider how board changes influence the likelihood of newly public firm acquisition. For instance, does the departure of outside directors during the years immediately following a firm's IPO influence the likelihood of that newly public firm being acquired? Does a change in board leadership structure from the case of CEO duality to non-CEO duality impact the likelihood of newly public firm acquisitions? Answering such questions may represent potentially fruitful avenues for future research that are left unanswered by this study.

Third, given this study's focus on newly public firms, the findings of this study may not generalize to non-newly public firms. Due to the heightened level of scrutiny faced by firms as they transition to public markets, newly public firms strive to put their best selves forward in terms of board staffing. This desire may

cause newly public firms to staff their boards in a manner that is more consistent with stockholder interests and less consistent with managerial interests. As a result, future research may provide insight into the extent to which board characteristics shape the likelihood of acquisition for firms that successfully navigate the transition from being ‘newly public’ to simply ‘public

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