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2011

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Johnson, Scott; Schnatterly, Karen; Bolton, Joel F.; and Tuggle, Chris S., "Antecedents of New Director Social Capital" (2011).

*Management Department Faculty Publications*. 115.

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## Antecedents of New Director Social Capital

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### Abstract

Prior research shows that firms benefit from the social capital of their boards of directors but has not explored the antecedents of new director social capital. We argue that firms can attract directors with social capital by offering more compensation. We also argue that more complex firms (firms with a greater scale and scope of operations) are more attractive to such directors because of the greater experience and exposure that such directorships provide. Similarly, we argue that firms with high-status directors on their current boards will be more attractive to directors with social capital. We analyze the social capital of new outside directors added to boards of semiconductor firms between 1993 and 2007. Surprisingly, we find no support for the hypothesis that higher compensation is associated with adding directors with high status or board ties. However, firm complexity is associated with the ability to add new directors who have social capital, and the status of current board members is associated with the ability to add new directors who also have high status.

### Introduction

There is general consensus that board members can both benefit and harm the firms for which they serve as directors (Hillman et al., 2000; Payne et al., 2009; Ruigrok et al., 2006). One of the most valuable attributes that a director can bring to a board is social capital (D'Aveni, 1990; Hillman, 2005; Stevenson and Radin, 2009). However, prior research mostly treats board social capital as exogenous and therefore does not explore the question of why directors with these valuable attributes end up on the boards of some firms and not others. This literature does not address the issue of whether all firms have the same opportunity or inclination to add new directors with social capital. Understanding the antecedents of new director social capital is a first step towards advancing governance theory by putting studies of director social capital in context (Hambrick et al., 2008).

Within corporate governance research, two distinct dimensions of social capital have been investigated. The first builds on resource dependence theory (Pfeffer and Salancik, 1978) and focuses on board members' ties to other organizations. The second type of social capital builds on the notion of status, which is conceptualized as unearned ascription of social rank (Washington and Zajac, 2005). While all current and potential directors are members of an elite group (Jensen and Zajac, 2004), there are still differences in social capital among directors. In the case of ties to organizations, some directors may serve on only one board, for example, while other directors may serve on several. With regard to status, some board members may have achieved high status in the arenas of military, government, or business while others have not (D'Aveni, 1990).

Social capital researchers in the context of governance argue that directors with high social capital can bring information about the external environment, other firms' strategies, and prospective managerial talent (Certo, 2003; Davis, 1991; Haunschild, 1993). Empirical research in this area demonstrates the consistent positive impact of high social capital. For example, directors who serve in a political capacity while also on the board improve firm value (Hillman et al., 1999). Firms with more ex-politicians on the board perform better than firms with fewer or none, especially in regulated industries (Hillman, 2005), and social capital on the board can help firms avoid bankruptcy (D'Aveni, 1990). Additionally, directors of acquisition targets who serve on multiple corporate boards improve performance (Keys and Li, 2005). Since directors with high social capital benefit the firm by serving on the board, they are likely to be sought after by multiple firms (Kim and Cannella, 2008). Our question then is: what are the antecedents of a firm's ability to add new directors with high social capital?

Theories of resource dependence and social status explain how directors with social capital can benefit the firms that they serve, but these theories do not explain why some boards have more director social capital than others. A new director who joins a board has to be first invited and then must agree to accept the invitation. The needs of the firm and the social connections of current board members will influence who is invited to join the board. The attractiveness of the firm will influence who will accept the invitations. Directors, just like managers, are at least partially motivated by self-interest. We argue that three primary factors are associated with a new director's social capital: compensation, the reputational benefits of being associated with a firm, and the social benefits of being associated with the other directors on the board. We extend governance research by exploring the antecedents to new director social capital, and we extend governance theory by introducing the notion that attributes of the firm and its board influence the types of directors that join the board in the future. We also add some clarity to the study of board social capital by distinguishing between the social capital on the board as a whole and that of individual directors.

We investigate what influences potential directors to join a board by analyzing publicly held semiconductor firms that added outside directors between 1993 and 2007. In our sample, 106 unique firms added a total of 336 new directors. We find that firm complexity (i.e. the scale and scope of the firm) is positively associated with the number of board ties and the status of new directors. Furthermore, the status of the current board is positively associated with new directors who have high status. We were surprised to find that board member compensation appears to have no effect on the social capital that firms are able to

attract to their boards. Part of building a better understanding of board processes and effectiveness is discerning the antecedents of board social capital (Hambrick et al., 2008), and that is the motivation of this study.

## Theory and hypotheses

Before we present our hypotheses, we first explain why high social capital is valuable on the board and next explain how new directors are selected. We then focus on why firms differ in the social capital of new directors added to their boards.

### *Social Capital on the Board*

Social capital refers to a person's socially valuable personal attributes and network connections (Lester et al., 2008; Nahapiet and Ghoshal, 1998). These attributes and connections benefit the firm (Haunschild, 1993; Lester et al., 2008; Payne et al., 2009). A closer look at the theories underlying board social capital reveals two very different types, or dimensions, of social capital that can benefit the firm – ties to external organizations and high status, or prestige. These dimensions of social capital dominate the research in this area. Most previous research treats the board as a single entity; and we see that boards collectively pool the capital of their members in the advice, counsel, provision of resources, and monitoring that they do (Kor and Sundaramurthy, 2009). However, we also see that individual directors vary with regard to the number of ties and the prestige that they possess.

One type of board social capital explored in the governance literature is ties to external organizations. The benefits that external ties can bring a firm are grounded in resource dependence theory (Pfeffer and Salancik, 1978). Proponents of resource dependence theory argue that organizational survival is dependent on the ability to access critical resources from the environment (Casciaro and Piskorski, 2005; Pfeffer and Salancik, 1978). Firms actively manage their resource environments by maintaining external linkages to organizations on which they depend for critical resources (Hillman, 2005; Westphal et al., 2006). Board co-optation – adding a representative of a critical resource to the board – constitutes one method of managing this dependence and benefiting the firm. Co-optation refers to the notion that once appointed to a board, the directors will support, identify with, and work to assist the firm (Hillman and Dalziel, 2003). Ultimately, these ties can impact firm performance (Nahapiet and Ghoshal, 1998). Furthermore, boards with directors who have ties to relevant organizations are able to provide better advice and counsel (Carpenter and Westphal, 2001). Previous work shows that ties, or interlocks, to other firms are associated with positive benefits such as strengthening the firm's linkages with the environment by facilitating relationships with other firms (Boyd, 1990) and improving the terms of acquisition if the firm becomes an acquisition target (Keys and Li, 2005).

Individual directors may sit on more than one board. The improvement in quality of advice and counsel comes from an improvement in the information resources that multiple board memberships bring (Zhang, 2008). An associated reason that ties bring benefits to the firm follows a network logic (Stevenson and Radin, 2009). In the network litera-

ture, the number of ties that a person has to others is a measure of degree centrality. Ties can benefit the firm through increased connectivity and embeddedness (Nahapiet and Ghoshal, 1998). Embeddedness in both resource and information networks on the part of directors facilitates their ability to advise and counsel management as well as their ability to acquire resources for the firm (Kor and Sundaramurthy, 2009). In sum, the greater the number of ties a director has to other firms, the greater the informational and network benefits for the firm.

Another type of board social capital explored in the governance literature is prestige or high status. Status is a function of an individual's personal associations and achievements. Directors with high status benefit the firm by influencing the perceptions of those outside the firm (D'Aveni, 1990). Directors who have attained membership in elite circles benefit the firm because a board's prestige signals the legitimacy of the firm. A board with prestigious directors is sending a signal to potential investors and trading partners that it is a legitimate and valuable entity (Certo, 2003). The status perspective suggests that organizations benefit simply by being associated with those who have attained high status (Bazerman and Schoorman, 1983; Washington and Zajac, 2005). High-status directors on a company's board are positively associated with better performance at its initial public offering (IPO) (Certo et al., 2001). Thus the prestige of the directors can positively impact the perception of firm value.

At the board level, board ties and high status – two key types of social capital – are often measured as a single construct (Belliveau et al., 1996; Certo et al., 2001; D'Aveni, 1990). While it is true that these two types of social capital are often found on the same boards, it is not the case that both forms of social capital are always attached to the same individuals. A quick read of company proxy statements will reveal many individuals with high status (e.g. university presidents, former generals) who serve on only one board. On the other hand, there are many professional directors who serve on multiple boards but would not be classified as individuals with high status. For this reason, we distinguish board ties and high status as two separate forms of social capital.

### *The Process of Director Selection*

According to the National Association of Corporate Directors, the typical relationship between the board and board candidates is initiated by the board. Replacing or recruiting a new director is a delicate process, and confidentiality for all involved parties at all points in the process is critical. The company's nominating committee identifies prospective directors in one of two primary ways: through current board member recommendations or through a hired executive search firm. The nominating committee puts names forward, and potential candidates are selected for interviews. Potential candidates may agree to be considered for the board, or they may decline. If potential directors agree, then they are added to the proxy statement for shareholder ratification. Although nominated directors must be formally approved by shareholders at the annual meeting, the shareholders almost always approve the nominations. No announcement or press release accompanies a director search. Only the final selection is announced, and there are no announcements of those who decline an invitation to join a board.

Since being a director is a prestigious job that provides valuable learning opportunities (Useem, 1982), a large pool of people is willing to serve on boards. Although the passage of the Sarbanes–Oxley Act (SOX) has increased the time commitment and potential financial risks of serving on a board, over 80 per cent of directors are willing to consider serving on an additional board in order to gain ‘affiliation with highly respected companies and other directors, exposure to other governance processes and the opportunity to gain new ideas’ (Neff and Heidrick, 2006, p. 1). Additionally, serving as a director enhances an executive’s leadership skills and visibility (Lublin, 2010). Many firms want to have ‘outside directors who are distinguished individuals who also have an ability to add value as directors’ (Adams et al., 2008, p. 32), so candidates for directorships with greater social capital are more likely to be selected as board members (Kim and Cannella, 2008). A firm can identify and invite a new director with high social capital to serve on the board, but convincing that valuable individual to accept the invitation will be determined in large part by how the potential director believes he or she will personally benefit from serving on the board.

Thus, to understand how directors with social capital end up on certain boards, we need to understand what factors influence firms to seek directors with social capital and what factors make directors with social capital more likely to accept an invitation to join a board. As there is little previous work that directly addresses the question of how directors choose their boards, we draw from work that explores what motivates existing directors. Theoretical work on director behavior identifies compensation and reputation as two primary motivators (e.g. Fich and Shivdasani, 2005; Hillman and Dalziel, 2003; Yermack, 2004). These scholars attempt to explain how the motivations of directors influence their behavior in the boardroom. They do not address the question of why a director initially joins a board. We theorize that what influences director behavior in the boardroom will also influence a potential director to join a board.

*Compensation.* Compared to the number of studies on executive compensation, there are relatively few studies of board compensation; and most of this research focuses on the drivers of board compensation rather than the effects of compensation on director behavior. Firm and board size are found to be positively associated with higher board compensation (Boyd, 1996; Linn and Park, 2005; Tufano and Sevick, 1997), and boards that have more directors from outside the company are awarded more equity-based compensation (Ryan and Wiggins, 2004). In addition, firms with greater agency problems use more contingent compensation (Bryan and Klein, 2004; Vafeas, 1999). Finally, the amount of work required by a particular board is positively associated with director compensation (Hempel and Fay, 1994).

There is, however, some empirical evidence that directors respond to financial incentives. Directors receive significant performance-based compensation that helps align the directors’ incentives with shareholders and positively impacts firm value (Fich and Shivdasani, 2005; Yermack, 2004). Even relatively small sums of money can influence director behavior. For example, meeting fees (which are often \$1000 or less) increase directors’ attendance (Adams and Ferreira, 2008). These studies highlight that compensation influences directors’ decision making. It follows that compensation could also influence a potential director’s decision to join a board. Indeed, if \$1000 can influence a director to at-

tend a meeting, an annual retainer and stock options worth tens or hundreds of thousands of dollars may influence a potential director to join a board. Therefore, greater compensation may influence potential directors who have greater social capital (ties or status) to agree to serve on that board. Thus, we hypothesize the following.

*Hypothesis 1a:* Board member compensation is positively associated with the number of board ties a new director has.

*Hypothesis 1b:* Board member compensation is positively associated with the status of a new director.

*Status of current directors.* In addition to compensation, an important benefit of serving on a board is being associated with the other individuals on that board. Individuals tend to be attracted to organizations composed of people with similar social characteristics (Ashforth and Mael, 1989), and this is especially true of individuals from high-status groups (Levin et al., 2002). Though all board members are to some extent corporate elites (Jensen and Zajac, 2004), research shows that directors are sensitive to differences in status. For example, Belliveau et al. (1996) demonstrate that social status differences among board members are salient in board decisions about CEO compensation, indicating that board decisions are swayed by higher status directors. Since directors are sensitive to status when making decisions, we also expect directors to be sensitive to status when extending invitations to potential new directors and we expect potential new directors to be sensitive to status when considering these invitations. Following the logic of Levin et al. (2002), a board composed of more high-status individuals will be more interested in adding new directors who have high status. Furthermore, such a board will have more relationships with people who have high status, so it will have a larger pool of directors with high social capital from which to recruit. When considering whether to serve on a board, a potential director will assess the status of the other directors serving on that board. A board with a greater number of high-status directors offers two advantages to a potential director: the advantage of being associated with the firm and the advantage of being associated with the existing directors of the firm. Since high-status individuals would be unwilling to risk their reputations, the existing presence of high-status individuals on a board signals high firm quality (Certo, 2003; Miller and Triana, 2009). Also, a potential director will have the opportunity to work closely with high-status people. A board with more high-status directors will more actively seek out new directors with social capital and will be more attractive to potential directors who have high social capital. Thus, we hypothesize the following.

*Hypothesis 2a:* The status of current board members is positively associated with the number of board ties a new director possesses.

*Hypothesis 2b:* The status of current board members is positively associated with the status of a new director.



*Firm complexity.* Perhaps one reason for the limited number of studies on board compensation is the belief that at least some outside directors 'aren't in it for the money' (Black et al., 2006, p. 48). In fact, Fama and Jensen (1983) argue that boards function best when director compensation is small because directors do not serve on boards primarily for monetary compensation. Early work in agency theory argued that directors serve on boards to establish their reputations as monitoring specialists and decision-control experts (Fama, 1980; Fama and Jensen, 1983). So, in addition to financial incentives, directors can benefit from service on a board by enhancing their reputations and prestige and growing their networks (Fich and Shivdasani, 2005). Serving on a board can also enhance directors' career opportunities and improve their chances to serve on other boards in the future (Yermack, 2004). Indeed, '[d]irectors' reputations would seem particularly important in the market for directorships. A strong reputation presumably aids in getting more board seats or retaining the ones already held; a weak reputation the opposite' (Adams et al., 2008, p. 42).

A firm's operational complexity is defined by its scale (revenue, assets, and employees) as well as its scope (number of different lines of business). There are two reasons that the reputational benefits of serving on a board increase with the complexity of the firm. First, complexity increases the difficulty of the board's role because of higher levels of information asymmetry (Sanders and Carpenter, 2003). In particular, larger firms have more significant agency problems (Boone et al., 2007; Linck et al., 2008), and their boards of directors must work harder to monitor management to assess whether the decisions that are being made are aligned with the interests of the shareholders (Jacobides and Croson, 2001). Directors who take on these more difficult jobs can establish their reputations as decision control experts and will 'be perceived [by others] as more skilled because of the size and complexity of the operations they oversee' (Ferris et al., 2003, p. 1089).

Second, directors gain the reputation of decision control experts (Fama, 1980; Fama and Jensen, 1983) only if they are noticed in the job. That is, directors have to be visible to peers and other firms. More complex firms are more visible in the marketplace because of their size and wider contracting environment (Ferris et al., 2003). Complex firms have a greater number of buyers, suppliers, and partners that result in increased external exposure. For the directors, this exposure affords them an opportunity to build their own reputations.

These two attributes of more complex firms – they are more difficult to monitor and have a wider contracting environment – may also cause them to actively seek new directors who have proven themselves by serving on other boards. Thus, we expect more complex firms to more actively seek new directors with high status or with experience on other boards, and we expect such directors to be more interested in serving on the boards of a more complex firms. Therefore, we hypothesize the following.

*Hypothesis 3a:* Firm complexity is positively associated with the number of board ties a new director has.

*Hypothesis 3b:* Firm complexity is positively associated with the status of a new director.



## Sample and methods

### *Sample*

In order to test our hypotheses, we analyzed new directors who join the boards of firms in a single industry – semiconductors and related devices (SIC = 3674). While a single-industry sample limited our ability to generalize our results, it does have some advantages. The firms within the sample are similar, so it is more plausible that a new board member added to one firm in the sample could be a candidate for the board of another firm in the sample. Second, a single-industry research design controls for the fact that firms in different industries may value status (or different types of status) differently. For example, Hillman (2005) finds that firms in regulated industries have more politicians on their boards and benefit more when they have them.

We gathered our data from two different time periods. We originally chose to study the semiconductor industry in the years between 1993 and 2000 to take advantage of the fact that rapid industry growth led most firms in the industry to add new outside directors to their boards. Two years after the end of this time period, SOX went into effect. This law increased the responsibilities and potential legal liabilities of outside board members and also required that directors, especially audit committee members, have more expertise. While we did not expect SOX to directly affect the mechanisms of board social capital, we wanted to ensure that the study findings were generalizable to the post-SOX era. So we gathered an additional sample of outside directors who were added to boards in the years between 2002 and 2007.

We generated the first sample for the years between 1993 and 2000 by identifying all the firms in the Compustat database that are classified with semiconductors and related devices (SIC = 3674) as their primary industry. We eliminated firms that are not traded on a major stock exchange, that are not incorporated in the United States, or that have missing financial data. For each firm, we searched EDGAR, Lexis-Nexis, and Laser D for proxy statements or 10 K reports that correspond to the appropriate fiscal years. The earliest proxy statements were obtained through Laser D since this was before the Securities and Exchange Commission (SEC) requirement for electronic filing of proxy statements. Later proxy statements were obtained through the SEC EDGAR database. These proxy statements were the source of information about directors' backgrounds and director compensation. Some firms are included in Compustat before their stock is publicly traded or after they have been delisted from an exchange, so the SEC documents are not available for them. We excluded these firms from our sample. Within the time period of our first sample, 232 new outside directors were added to the boards of 91 unique firms. The gathering of additional data was facilitated by the introduction of new databases of corporate directors. We generated the second sample using the Corporate Library and Investor Responsibility Research Center databases to identify new outside directors added to semiconductor company boards after the enactment of the Sarbanes-Oxley Act of 2002 through the 2007 fiscal year. Significantly fewer outside directors were added in this time period due to industry consolidation that has reduced the number of firms in the industry and slower growth that has reduced the need for new directors. In this period, 104 new outside directors were added to the boards of 49 unique firms. We obtained the proxy state-

ments corresponding to the years that these directors were added and coded information about director compensation and the social capital of current and new board members. The combined sample has 336 new outside directors added to 106 unique firms.

### **Measures**

*Dependent variables.* Our hypotheses concern two forms of possible new director social capital. *Board Ties* is the total number of other boards on which the new board member serves. Measuring status was much more difficult. Early research on board prestige combines measures of board interlocks with the social status of directors. For example, D'Aveni (1990) measures board prestige by looking at board interlocks as well as membership in the political, military, or educational elite. He operationalizes the experience component of top management prestige using information in the *Dunn and Bradstreet Directory of Corporate Management*, but this eliminates many potential firms from his sample because the directory focuses on larger firms. We used similar criteria to identify director status but relied on legally required disclosure of biographical information in annual proxy statements. Status can be achieved in a number of different arenas, so we looked at work experience that indicates any of five different types of status. Each of these five types of status corresponds to measures of prestige used by D'Aveni (1990). The dean of a college or president of a university has high academic status. The CEO of a firm has high business status. A general or admiral has high military status. Board members have high political status if they have previously held state- or national-level political offices. Board members have high social status if they have prominent roles in the community such as serving on notable not-for-profit boards (e.g. opera, museum). These represent the coding rules for whether a director has high status. Two coders identified status by reading each director's biographical statement and applying these decision rules. The coders agreed on status (high or not) and type of status (academic, military, political, business, social) of directors 97.7 per cent of the time. We treated all types of status as coequal as previous research has done little to articulate whether some types of status are more valuable than others. We address this point in more detail in the discussion section. *Status* is a binary variable indicating that the new director has achieved status in one or more of these areas.

*Independent variables.* Outside directors receive cash compensation in two primary ways: flat pay (annual fee) and contingent pay (options or stock). For the flat pay component, some firms offer an annual retainer of a fixed amount and other firms pay directors for each meeting attended. Some firms pay both a retainer and a fee per meeting attended. *Flat Pay* was determined by multiplying the meeting fee by the number of meetings per year and then adding the annual retainer. A number of firms also pay additional amounts for committee memberships and committee chairs. We excluded this component of director pay as it can vary both between directors and across time (as directors are added or dropped from committees). The flat pay measure is the minimum that a director will receive as a board member.

While meeting fees and cash retainers exhibit modest increases or even decreases, the use of equity compensation exploded during the mid-1990s (Fich and Shivdasani, 2005).

We measured *Contingent Pay* as the value of stock and stock options granted, based on the value of the stock on the day of the grant, and the value of options granted annually, assuming the options would be exercised in 10 years (the most common exercise time period) with 10 per cent stock appreciation. This number, as well as the value based on 5 per cent appreciation, is commonly reported in the proxy statements. This valuation method avoids the problems inherent in using Black–Scholes valuation, which requires that options terms be no longer than two years and that all options be instantly tradable (Henderson, 2005) – factors that are noticeably absent for compensation options. *Total Pay* is the natural logarithm of the sum of annual flat pay and annual contingent pay. We used five measures to assess firm complexity. *Assets* is the natural logarithm of the firm's assets. *Sales* is the natural logarithm of annual sales. *Employees* is the natural logarithm of the number of employees in the firm. *Geographic Diversification* is measured as 1 minus the Herfindahl index of the sales reported by geographic segments, and *Business Diversification* is measured as 1 minus the Herfindahl index of sales reported by industry segments. These two diversification measures capture the scope dimension of complexity. The variable *Firm Complexity* was created by standardizing each of these variables (mean of 0, standard deviation of 1), summing them and dividing the total by five. Cronbach's alpha for the resulting variable was 0.836. We coded the status of existing board members using the same categories that were used to code the status of new board members. *Current Board Status* is the number of current board members who have achieved high status in any of the five status arenas (education, military, business, political, or community).

*Control variables.* Our first control variable was *Current Board Ties*, which is the total number of ties to other corporate boards that the current board has. We controlled for *Meetings*, or the number of board meetings held during the year, as this has been used in previous research on director motivations as a measure of director effort (Cordeiro et al., 2000; Hempel and Fay, 1994). Potential directors may be influenced by the effort or time that they will have to spend on the job of director. We also controlled for whether the board has a nominating committee (*Nominating Committee*). The Nominating Committee has influence over the identification of new board members, so its existence may influence the type of director that joins the board.

*Instrumental variables.* In our modelling, we treated *Total Pay* as an endogenous variable since prior research demonstrates that board compensation is determined by firm attributes like complexity. Thus, in order to estimate the effect of compensation, we needed instrumental variables that predict *Total Pay* but that did not expect to be related to the social capital of new board members. The first instrumental variable was the relative independence of the board members since boards that have more directors from outside the company are awarded more equity-based compensation (Ryan and Wiggins, 2004). *Independence* is the percentage of directors who are not insiders (directors listed in the management compensation table) or affiliated directors. We classified affiliated directors using SEC regulation 14A, item 6(b), where affiliated directors include relatives, customers, suppliers, lawyers, and bankers (Daily and Dalton, 1994; Tihanyi et al., 2003). All other directors who are outsiders are independent outsiders. Our second instrumental variable was

**Table I.** List of variables

Variable	Measurement
Dependent variables	
Board ties	No. of other boards on which the new director sits
Status	Binary: = 1 if new director has status, otherwise = 0
Independent variables	
Total pay	Natural log of (Flat Pay + Contingent Pay)
Flat pay	Sum of annual retainer and meeting fees
Contingent pay	Value stock at issue date and value of options assuming 10 years of 10% appreciation
Firm complexity	Factor including the following five variables:
Assets	Natural log of assets
Sales	Natural log of sales
Employees	Natural log of employees
Geographic diversification	$1 - \sum s^2$ ( $s$ is the share of sales in each geographic segment)
Business diversification	$1 - \sum s^2$ ( $s$ is the share of sales in each industry segment)
Current board status	No. of existing directors with status
Control variables	
Current board ties	No. of other boards on which the existing directors sit
Meetings	No. of board meetings, annual
Nominating committee	Binary variable, = 1 if firm has nominating committee
Instrumental variables	
Independence	% of independent outsiders on the board
Board size	The count of the directors on the board
Separate chair	Binary variable, = 1 if CEO is <i>not</i> also chair
Return	Stock return for previous 24 months
Firm age	No. of years since firm's IPO

*Board Size* since it has been found to be positively associated with higher board compensation (Boyd, 1996; Hempel and Fay, 1994; Linn and Park, 2005). We controlled for the CEO not also serving as the chair of the board (*Separate Chair*) to address the influence that the current CEO might have on setting board compensation levels. Past performance of the firm was measured with *Return*, or the 24-month stock return. Since a part of board compensation is given as stock options, increases in stock price are likely to increase total pay. The age of the firm may influence board compensation since older firms have different demands on director effort. *Firm Age* is the number of years the firm has been public. Finally, we included dummy variables for each year to control for contemporaneous correlation. Table I presents a summary of our variables and their measures.

### **Method**

We faced a number of methodological challenges in estimating a model to test our hypotheses. First, our two independent variables were simultaneously determined and were likely to be correlated since we hypothesized that both ties and status were attracted by

the same firm attributes. Second, one of our independent variables (*Total Pay*) was shown in prior research to be associated with another of our independent variables (*Firm Complexity*). Both of these problems can be addressed by estimating a system of three equations: one equation for each of our dependent variables (*Board Ties* and *Status*) and a third equation for *Total Pay*, which is an endogenous variable that is also an explanatory variable for the first two equations.

$$\text{Board Ties} = \alpha_1 + \beta_1 X + \eta_1$$

$$\text{Status} = \alpha_2 + \beta_2 X + \eta_2$$

$$\text{Total Pay} = \alpha_3 + \gamma Z + \eta_3$$

In these equations, the matrix  $X$  contains the three hypothesized variables (*Total Pay*, *Firm Complexity*, and *Current Board Status*) as well as the three control variables (*Current Board Ties*, *Meetings*, and *Nominating Committee*). The matrix  $Z$  contains these variables and the instrumental variables (*Independence*, *Board Size*, *Separate Chair*, *Return*, *Firm Age*, and the dummy variables for each year). We used a three-stage least squares estimation technique that uses generalized least squares to correct for the correlation of the error terms ( $\eta_1$ ,  $\eta_2$  and  $\eta_3$ ) and instrumental variables to produce consistent coefficient estimates with an endogenous variable.

The three-stage least squares model corrected some of the estimation issues that we faced, but two additional issues were not accounted for. Our analysis focused on explaining which of the directors added to boards had high social capital. In most cases, boards add only one new outside director in a given year, but they sometimes add two, three, or (in one case) four directors at a time. These are not independent events, and treating them as such created the potential for biased estimates. Furthermore, our two dependent variables were not continuous variables since *Board Ties* is a count variable and *Status* is a binary variable. There are panel estimation techniques that correct for potential bias created by non-independent observations and methods for modelling discreet dependent variables, but these methods do not work well in a system of equations that is designed to deal with two dependent variables and an endogenous predictor variable. As a result, in order to check the robustness of our three-stage least squares estimation and to understand the impact of these two issues on our estimation, we estimated two separate random effects models. To address variable discreteness, we used a negative binomial model for *Board Ties* because of the relatively low number of new director additions and a logit model for *Status* because it is a binary variable. Additionally, both of these models allow for non-independence of observations.

## Results

Descriptive statistics and the correlation matrix for all variables are presented in Table II. On average, new directors had a total of 1.08 ties to other corporate boards and had high status 25 per cent of the time. *Total Pay*, *Firm Complexity*, *Current Board Status*, *Current Board Ties*, *Board Size*, and *Firm Age* were all positively correlated with both *Board Ties* and *Status*. Board *Independence* was positively associated with *Status*. Separate CEO–Chair roles were positively associated with *Board Ties*.

**Table II.** Descriptive statistics and correlations for attracting board capital models

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Board Ties	1.08	1.45	1.												
2. Status	0.25	0.43	0.31 <sup>***</sup>	1.											
3. Total Pay	4.79	1.54	0.21 <sup>***</sup>	0.19 <sup>***</sup>	1.										
4. Firm Complexity	0.04	0.81	0.28 <sup>***</sup>	0.34 <sup>***</sup>	0.41 <sup>***</sup>	1.									
5. Current Board Status	1.13	1.48	0.26 <sup>***</sup>	0.40 <sup>***</sup>	0.30 <sup>***</sup>	0.52 <sup>***</sup>	1.								
6. Current Board Ties	6.22	5.76	0.31 <sup>***</sup>	0.24 <sup>***</sup>	0.26 <sup>***</sup>	0.40 <sup>***</sup>	0.62 <sup>***</sup>	1.							
7. Meetings	7.44	4.19	0.10	0.09	0.22 <sup>***</sup>	0.19 <sup>***</sup>	0.21 <sup>***</sup>	0.11 <sup>*</sup>	1.						
8. Independence	0.36	0.26	0.09	0.23 <sup>***</sup>	0.33 <sup>***</sup>	0.46 <sup>***</sup>	0.48 <sup>***</sup>	0.19 <sup>***</sup>	0.19 <sup>***</sup>	1.					
9. Board Size	6.38	1.80	0.14 <sup>*</sup>	0.13 <sup>*</sup>	0.19 <sup>***</sup>	0.31 <sup>***</sup>	0.31 <sup>***</sup>	0.54 <sup>***</sup>	0.01	-0.08	1.				
10. Nom. Committee	-0.17	0.64	0.04	-0.05	-0.04	-0.24 <sup>***</sup>	-0.21 <sup>***</sup>	0.12 <sup>*</sup>	-0.08	-0.60 <sup>***</sup>	0.27 <sup>***</sup>	1.			
11. Separate Chair	0.44	0.50	0.13 <sup>*</sup>	0.10	0.06	0.11 <sup>*</sup>	0.18 <sup>***</sup>	0.14 <sup>*</sup>	0.11 <sup>*</sup>	0.16 <sup>**</sup>	0.08	-0.21 <sup>***</sup>	1.		
12. Return	0.36	0.81	0.03	-0.06	0.22 <sup>***</sup>	0.03	-0.06	0.09	-0.02	-0.12 <sup>*</sup>	0.16 <sup>**</sup>	0.15 <sup>**</sup>	-0.07	1.	
13. Firm Age	13.85	10.40	0.16 <sup>**</sup>	0.17 <sup>**</sup>	0.00	0.42 <sup>***</sup>	0.40 <sup>***</sup>	0.28 <sup>***</sup>	0.02	0.27 <sup>***</sup>	0.27 <sup>***</sup>	0.00	0.16 <sup>**</sup>	-0.08	1.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ;  $N = 336$

The log transformation of the compensation data complicates the interpretation of the mean, so we also provided more detail about this variable. The distribution of compensation was highly skewed, with some firms giving compensation packages worth over \$5 million and others giving only a few thousand per year; so while the median value of total compensation was \$140,000, the average of total compensation was \$370,000. The mean reported in the table (4.79) is the mean of the natural log of total compensation (in thousands) and corresponds to a total compensation of \$120,000. One interesting thing to note is that the aggregate measures of *Current Board Status* and *Current Board Ties* were much more highly correlated with each other ( $p = 0.62$ ) than were the individual measures of *Board Ties* and *Status* ( $p = 0.31$ ). Although prior research has frequently treated measures of social status and board ties as components of a single construct, these correlations are consistent with our argument that the two constructs are distinct, and individual directors with *either* form of social capital end up on the boards of similar firms.

We first estimated a system of equations with *Board Ties* and *Status* as the two dependent variables and *Total Pay* as an endogenous predictor variable. We estimated the system of equations first with just the observations before the Sarbanes–Oxley Act went into effect and then estimated the system of equations including the entire sample. There were significantly fewer new outside directors added to boards in the years after 2002 due to fewer firms remaining in the industry and slow growth of these firms. The coefficient estimates from the subsample and the whole sample were very similar. These results are presented in Table III, and we will focus on the combined sample estimation. In the first equation, testing the antecedents of a new director with board ties, the coefficients for *Total Pay* and *Current Board Status* were not statistically significant, so there was no support for Hypotheses 1a or 2a. However, the coefficient for *Firm Complexity* was positive and significant, indicating support for Hypothesis 3a ( $\beta = 0.369, p < 0.01$ ). In the second equation, testing the antecedents of a new director with status, the coefficient for *Total Pay* was again not significant, so there was no support for Hypothesis 1b. The coefficients for *Current Board Status* ( $\beta = 0.104, p < 0.001$ ) and *Firm Complexity* ( $\beta = 0.096, p < 0.05$ ) were both positive and significant, indicating support for Hypotheses 2b and 3b. The third equation was for *Total Pay*. While we did not develop hypotheses for these coefficients, it is interesting to note that these results confirm prior work by demonstrating that firm complexity increases board compensation. It is also noteworthy that three of our instrumental variables (*Independence*, *Return*, and *Firm Age*) were significant predictors of board compensation.

As noted in the methods section, our two dependent variables were discrete rather than continuous variables and some firms in the sample added more than one outside director in a given year, so not all of the observations were independent. To see whether these issues affected our results, we estimated two single-equation models. The first was a negative binomial model of *Board Ties*, and the second was a logit model of *Status*. Both of these models used a random effects estimator using firm-year as the panel variable. In other words, in cases where a firm added more than one director in a year, the model allowed the error terms of these observations to be correlated. These results are presented in Table IV. In the model of board ties, the coefficient for *Total Pay* was positive and statistically significant, supporting Hypothesis 1a ( $\beta = 0.129, p < 0.05$ ). The coefficient for



**Table III.** Three-stage least squares regression model of board ties and status

Variable	Pre-Sarbanes-Oxley sample		Combined sample	
	Estimate	SE	Estimate	SE
<i>Equation 1 – DV = Board Ties</i>				
H1a – Total Pay	-0.067	(0.115)	-0.061	(0.112)
H2a – Current Board Status	0.186†	(0.110)	0.065	(0.074)
H3a – Firm Complexity	0.410**	(0.159)	0.369**	(0.133)
Current Board Ties	0.027	(0.022)	0.046*	(0.018)
Meetings	0.037	(0.031)	0.018	(0.019)
Nominating Committee	-0.013	(0.274)	0.189	(0.130)
Constant	0.789	(0.477)	0.896	(0.505)
Equation 1 – R <sub>2</sub>	0.138		0.118	
<i>Equation 2 – DV = Status</i>				
H1b – Total Pay	0.016	(0.026)	0.023	(0.032)
H2b – Current Board Status	0.113***	(0.025)	0.104***	(0.021)
H3b – Firm Complexity	0.072*	(0.036)	0.096*	(0.038)
Current Board Ties	-0.006	(0.005)	-0.006	(0.005)
Meetings	-0.016*	(0.007)	-0.002	(0.005)
Nominating Committee	0.248***	(0.062)	0.055	(0.038)
Constant	0.123	(0.108)	0.081	(0.145)
Equation 2 – R <sub>2</sub>	0.314		0.186	
<i>Equation 3 – DV = Total Pay</i>				
Firm Complexity	0.619***	(0.142)	0.573***	(0.113)
Current Board Status	0.103	(0.108)	0.090	(0.071)
Current Board Ties	0.000	(0.022)	-0.005	(0.018)
Meetings	0.074**	(0.028)	0.030	(0.017)
Nominating Committee	1.021***	(0.268)	1.014***	(0.222)
Independence	1.683**	(0.546)	1.588***	(0.436)
Board Size	0.085	(0.061)	0.067	(0.048)
Separate Chair	0.089	(0.189)	-0.004	(0.142)
Return	0.498***	(0.115)	0.437***	(0.093)
Firm Age	-0.061***	(0.011)	-0.041***	(0.008)
Dummy Variables for Years	(included)			
Constant	2.581***	(0.503)	2.887***	(0.412)
Equation 3 – R <sub>2</sub>	0.434		0.390	
Observations	232		336	

Standard errors in parentheses.

†  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

*Firm Complexity* was also positive and significant, supporting Hypothesis 3a ( $\beta = 0.386$ ,  $p < 0.01$ ). The coefficient for *Current Board Status* was not statistically significant, so there was no support for Hypothesis 2a. In the model of *Status*, the coefficient for *Total Pay* was not significant, so Hypothesis 1b was not supported. However, the respective coefficients for *Current Board Status* ( $\beta = 0.464$ ,  $p < 0.05$ ) and *Firm Complexity* ( $\beta = 0.650$ ,  $p < 0.05$ ) were marginally significant, providing partial support for Hypotheses 2b and 3b.

**Table IV.** Single-equation models of board ties and status

Variable	Negative binomial model of board ties		Logit model of status	
	Estimate	SE	Estimate	SE
H1 – Total pay	0.129*	(0.059)	0.046	(0.141)
H2 – Current board status	0.039	(0.067)	0.464*	(0.185)
H3 – Firm complexity	0.386**	(0.131)	0.650*	(0.301)
Current board ties	0.025	(0.016)	-0.024	(0.043)
Meetings	0.011	(0.016)	-0.041	(0.038)
Nominating committee	-0.156	(0.247)	2.038***	(0.608)
Independence	-0.175	(0.471)	-1.212	(1.170)
Board size	-0.084	(0.050)	0.063	(0.117)
Separate chair	0.326*	(0.154)	0.366	(0.343)
Return	0.048	(0.100)	-0.111	(0.249)
Firm age	0.002	(0.009)	-0.034	(0.020)
Dummy variables for years	(included)		(included)	
Constant	0.194	(0.513)	-1.485	(1.139)
Observations	336		336	

Standard errors in parentheses.

†  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

### Interpretation of Results

To interpret these results, we first considered the differences between the two estimation techniques and then explored the viability of alternate explanations of the results. Recall that the three-stage least squares estimation models *Total Pay* as an endogenous variable and allows for the simultaneous determination of the two dependent variables. The logit and negative binomial models did not account for these issues but better handled the fact that both dependent variables were discrete as well as the potential non-independence of all the observations. Three hypothesized relationships were strongly supported; both estimation techniques provided statistically significant coefficients. Firm complexity was positively related to adding new directors with more ties to other boards (Hypothesis 3a) and adding directors with high status (Hypothesis 3b). The number of current board members with high status was positively related to adding directors with high status (Hypothesis 3b).

The positive effect of board member compensation on the number of ties that new board members had (Hypothesis 1a) was only significant in the model where *Total Pay* was treated as an exogenous variable. *Total Pay* was significantly and positively related to *Firm Complexity* and other variables. Given the high  $R^2$  value for the equation in which *Total Pay* was treated as endogenous, it is clearly unwarranted to assume that board member compensation is exogenous. We also checked whether the log transformation used to create the *Total Pay* variable affected our results. When we estimated the system of equations using the untransformed variable, the coefficients for *Total Pay* were still not statistically significant. Thus, we must conclude that there is no support for Hypothesis 1a.

## Discussion

### *Implications for Research and Practice*

Mounting empirical evidence indicates that the social capital composition of a board influences both board processes and board effectiveness. Recently, Haynes and Hillman (2010) found that the social capital of board members influences the strategic direction of the firm, and Hoi and Robin (2010) found that social capital can help overcome damage to reputation caused by accounting fraud. One might conclude from this literature that firms seeking board effectiveness should simply add more directors with social capital to their boards. We found, however, that the story is more complicated than that. Our contribution to this literature is the demonstration of firm-level antecedents to board social capital, and we thus provide some insight into why some firms end up with more directors with social capital than other firms.

Our finding that more complex firms add more new directors with ties and high status is consistent with the claim of agency theory that directors serve on boards to enhance their reputations as decision control experts (Fama and Jensen, 1983). As complexity is associated with the visibility of the firm, new directors with high social capital are attracted to firms and boards that are more likely to be noticed by peers, investors, analysts, and other firms. Further, a complex firm is associated with a more difficult task for board members since firm complexity is associated with information asymmetry and a greater need for monitoring. Therefore, directors who join the board of a complex firm may be perceived as more skilled because of the greater difficulty of the director's job as well as the visibility entailed in being on the board of such a firm. Thus, not only does serving on the board of a complex firm help enhance such a reputation because more complex firms have higher visibility (Ferris et al., 2003), but it also allows directors to gain expertise that can be transferred to other firms (Westphal and Fredrickson, 2001).

This finding is also consistent with the idea that more complex firms more actively seek out new directors with social capital. Since more complex firms are more visible, they may see the additional benefit of having prestigious board members. More complex firms also face greater information asymmetry, so they may want board members who have proven themselves by successfully serving on the boards of other firms. Furthermore, more complex firms have a wider contracting environment and are more visible, so the board ties and status of directors are likely to be even more advantageous for complex firms. The decision to join a new board appears to be more influenced by the firm's complexity than by the remuneration. This point, however, should not be taken to imply that directors are not influenced by pay. Prior research has shown that board member compensation influences whether board members attend meetings (Adams and Ferreira, 2008) and even influences board decisions of whether to grant stock options to the CEO (Kanagaretnam et al., 2004). Various countries in the European Union have conflicting guidelines regarding whether directors should be granted stock options (Gergory and Simmelkjaer, 2002). Our results suggest that such guidelines should be based on the potential impact that director compensation has on board members' decisions rather than on how compensation may attract better board members. Along these lines, as many directors receive significant compensation at their full time jobs, they may not be looking for significant compensation as direc-

tors. However, given that public firms disclose their director pay policy, there may be some social comparison or “keeping score.” As a result, directors can certainly be influenced by pay, but it may not be the primary motivator for joining a board.

We also find that boards with high-status directors are more likely to add new board members with high status. The argument that individuals tend to be attracted to organizations composed of people with similar social characteristics (Ashforth and Mael, 1989) and that this is especially true of individuals from high-status groups (Levin et al., 2002) is strongly reinforced in the context of boards of directors. In this case, boards that have high-status directors will be more interested in adding more high-status directors while at the same time potential high-status directors will be more attracted to those firms. This demonstrates what other authors have called the “Matthew effect” (Merton, 1968; Washington and Zajac, 2005) – the idea that social advantages tend to be perpetuated over time.

A final implication of this study is that the two types of social capital that we study should be analyzed separately instead of combined into a single construct. Prior research looks at board social capital aggregated across the whole board of directors and finds high correlations between measures of status and ties to other firms. In our sample, we also find high correlation between these aggregate measures; but when we look at individual directors, the correlations are much lower. This is consistent with anecdotal observations that there are many board members with high status who do not serve on multiple boards and many individuals that serve on multiple boards who do not have high status. Our results suggest that the high correlation of the aggregate measures may be caused by the fact that directors with either type of social capital are attracted to more complex firms. The finding that the number of ties that the current board has is not related to new directors with either form of social capital is further evidence that the two types of social capital are related but distinct constructs.

### ***Limitations and Future Research***

More complex firms end up with more new directors with social capital, although it is not clear from our analysis whether complex firms seek out new directors with social capital or whether directors with social capital are more attracted to more complex firms. However, we find no evidence in this sample that director compensation is related to adding directors with social capital. Firms that are seeking a way to create advantage by adding social capital to their boards, as suggested by Hillman and Dalziel (2003), will have to look for other ways to attract them. Future research could explore the possibility that other attributes, such as the social network of the CEO or the connections of large investors, can attract directors with social capital. If managers can figure out a way to attract directors with social capital, our results suggest that they may be doubly valuable because their status can positively impact the firm and is associated with adding new directors to the board who have high status as well.

In this study we find that firm complexity is a clear antecedent to new social capital on the board, and the current status of the board is positively related to the status of new directors. We know nothing about all of the directors that firms want or invite, only those who are invited and accept the invitation. Thus, we are not able to conclude

whether these associations are caused by the recruiting process of boards, the decision process of invited board members, or some combination of the two. There are significant barriers to clarifying this process given the high value of confidentiality on both sides, but perhaps some progress could be made with confidential surveys or interviews with nomination committee members.

Whatever the mechanism underlying the relationship between firm complexity and board social capital, the existence of firm-level antecedents to board social capital raises an important methodological issue. As mentioned above, numerous empirical studies support the idea that firms with more board social capital have better outcomes than firms with less. However, our results suggest a possible alternative explanation – the attributes that make a firm more attractive to potential board members with social capital also help the firm to achieve better outcomes. Studies that carefully control for the endogeneity of board membership are required to establish the causal direction of the relationship between board social capital and firm outcomes.

In this study we focused on a single industry. We have already discussed the benefits of a one-industry study – firms within the sample are similar, so it is more plausible that a new board member added to one firm in the sample could be a candidate for the board of another firm in the sample, and the study design controls for the fact that firms in different industries may value status differently. Future research may be able to compare different industries. For example, it may be that some industries are more attractive to potential directors than others. We also did not differentiate among different types of status, although we suspect that directors with different types of status would be attracted differently, for example, to firms in highly regulated industries or industries that are more visible such as entertainment. This appears to be a fruitful avenue for future research.

## Conclusion

While some have suggested that social capital on the board can be valuable to the firm (Hillman and Dalziel, 2003), and studies have shown that social capital can be valuable in various contexts (D'Aveni, 1990; Hillman, 2005; Keys and Li, 2005), we think it is important to ask how some firms end up with more social capital on their boards than others. Our results indicate that firm characteristics strongly influence a firm's ability to add new directors with social capital. This study contributes to the corporate governance literature in two main ways. First, we extend governance research by demonstrating some antecedents to the board's social capital composition. Second, we add some clarity to the study of board social capital not only by distinguishing between two different types of social capital but also by distinguishing between the social capital on the board as a whole and the social capital of individual directors.

**Acknowledgments** – We thank participants at the 2007 Academy of Management Annual Conference and David Souder for constructive comments on earlier drafts of this manuscript. All errors remain our own.

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