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Human Capital and Professional Network Effects on Women's Odds of Corporate Board Directorships

Introduction

Research on women on boards of directors is a growing field of study with great relevance for corporate, social, and national policy (Bilimoria, 2000). Prior research on women directors has focused mostly on human capital variables such as education, experience in leadership positions, age, and race (Singh, Terjesen & Vinnicombe, 2008; Johnson, Schnatterly & Hill, 2012), generally seeking to understand gender differences in demographic characteristics and the effects of board diversity on board and firm performance. Though previous descriptive studies in the corporate governance literature point to the importance of network connections for board appointments (Lorsch, 1989; Bilimoria & Huse, 1997; LeBlanc & Gillies, 2005), few studies have undertaken large sample quantitative examination of the role of professional networks on the relative probability of women being appointed to corporate boards as compared with men (Johnson, Schnatterly & Hill, 2012). In the current study, we directly address this knowledge gap by investigating how human capital and professional networks contribute to women's as compared with men's odds of corporate board membership.

Literature review

Prior research on board membership provides limited information pertaining to the processes of selection of individual directors (Withers, Hillman & Cannella, 2012). Research drawing on resource dependence theory has shown that directors are chosen on the basis of their access to resources necessary for the effective performance and competitive advantage of the company (see Withers, Hillman and Cannella, 2012 for an in-depth review). However, there is a

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large body of literature that indicates that the relationship between board composition and firm performance may be tenuous (e.g., Hermalin & Weisbach, 2003; Carter, Simkins & Simpson, 2003; Adams & Ferriera, 2008). There is also some evidence indicating CEOs' preferences for appointing persons known to them or those with whom they can claim a relationship as independent directors to their boards (Sheridan & Milgate, 2005; Westphal & Stern, 2006). Therefore, neither the resource dependence theory nor the CEO preference framework individually explains the criteria utilized in the director selection process. Rather, it is likely that both these frameworks, together with other socio-psychological theories, can advance knowledge about the comprehensive set of criteria underlying corporate board appointments. In order to closely approximate such a comprehensive set, in this study we examine both the human capital and professional network characteristics of newly appointed corporate directors.

While human capital and professional networks comprise a more comprehensive set of director selection criteria, examining them is an extremely difficult task. One obstacle to such an investigation is the confidentiality of the director selection process—it is extremely difficult to obtain the list of candidates considered for selection to a board. There is also difficulty associated with collecting data on the professional networks of potential board members. However, recent developments in web-based data mining methods and growing interest in the area have facilitated a way of constructing the professional networks of those appointed to corporate boards, allowing us to conduct this study of the comparative characteristics of female and male independent directors on the boards of public corporations.

The purpose of this study is to examine how women and men newly appointed directors of public corporations differ on their human capital and professional network characteristics. It is our contention that the human capital variables (such as age, qualification, and professional

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experience) and professional network variables (including network composition and structure elements) contribute differently to men's and women's likelihoods of obtaining board memberships.

Appointment of women on U.S. corporate boards

The percentage of women on public company boards in the U.S. has been growing at a slow pace. In 2001, of 5821 board seats on Fortune 500 companies, 480 were occupied by women; women held 568 positions in a reduced total of 5161 seats on the board in 2005 (Branson, 2007). In 2011, 636 women occupied board positions out of a total of 5315 seats[1]. This is an increase from 8.3 percent to 12 percent in a decade. A large proportion of this increase has been in the representation of a single woman on a corporate board. Increases in the representation of women per board over the same period have been negligible.

The profile of the female independent director of a public company has remained constant over time in some aspects but has also undergone some change in other aspects, with variations existing between different sets of companies (e.g., *Fortune* 1000 and Standard & Poor's 1500 samples). In terms of consistencies over the decade, women directors continue to remain younger than their male counterparts, and are consequently 'over-achieving' relative to their male counterparts (Groysberg & Bell, 2013). In terms of differences, the professional profile of women directors appears to have changed from the previous couple of decades. However, the change in profile has been among the women directors of the larger, more visible *Fortune* 1000 set of companies rather than the more varied Standard & Poor's set of 1500 large-cap, medium-cap and small-cap companies. Women directors of *Fortune* 1000 companies are increasingly drawn from operational roles such as finance and manufacturing in private

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[1] Data obtained by the authors from WRDS database at University of Pennsylvania and corroborated with data from the Boardex databse.

companies (Groysberg & Bell, 2013). On the other hand, sampling from Standard & Poor's 1500 companies reveals that women directors continue to be drawn from non-corporate professional backgrounds such as education, medicine and consulting (Simpson, Carter & D'Souza, 2010). This variance may be explained by the degree of variation in the visibility of companies in the two sets. *Fortune* 1000 companies are under greater scrutiny by the media as well as academic researchers on account of their larger size. The range of Standard & Poor's 1500 companies in terms of size, industry and visibility is far greater, with implications on the institutional pressures they face to include women on their boards.

Another factor in the stagnant percentage of women on boards is the 'replacement effect'. Previous research provides evidence that the addition of a female outside director is significantly related to the departure of another director, whether female or male; however, the effect does not hold for departure of inside directors (Farrell & Hersch, 2005). Moreover, these same authors also found that the likelihood of the addition of a female director is greater when the departing director is female. This finding was corroborated by evidence provided by Groysberg & Bell (2013) that boards do not consider female candidates for board membership except under the agenda of gender diversity.

To summarize, women directors in the U.S. have breached some barriers such as the professional backgrounds from which they can aspire to board positions. Yet, board directorship is still not a career trajectory that can be expected without women's 'over-achievement' in the corporate sector.

Human Capital

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A number of human capital characteristics are important for corporate board directors. In their role of monitors of corporate activity and advisors to the top management team, directors need to possess business acumen and/or knowledge of their field of expertise. Business acumen tends to be indicated by a combination of educational qualifications and professional experience. Age is frequently considered a proxy for the maturity to understand and participate in collaborative behaviors in the boardroom. The combination of director age, educational qualifications, profession, and previous professional experience (particularly experience on other boards of directors) is commonly referred to as human capital (Withers, Hillman & Cannella Jr., 2012).

We have ample evidence, anecdotal and empirical, of the type of human capital that is desirable in corporate directors. For a long time, boards were considered a fiefdom of Caucasian men from established business families with degrees from Ivy League universities (Mills, 1956; Useem, 1984; Branson, 2006). As ownership of companies transferred from family groups to shareholders and investment firms, board composition transformed to include members of top management teams, including from large investors. Changes in regulation and public sentiment led to the inclusion of community organizers and government officials. The evolution of the business environment transformed the composition of boards from fiefdoms to professional cliques. When the call for diversity in the boardroom became persistent and more powerful, women, particularly those in leadership positions, were invited to join in the boardroom. Early research found that women directors usually came from non-business occupations such as community service or philanthropic nonprofit organizations, past government positions, or educational institutions, often those that catered to women (Harrigan, 1981; Kesner, 1988). Two decades later, Hillman, Cannella Jr. and Harris (2002) found that not much had changed with

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respect to the "type" of women who were being invited to corporate boards – women on corporate boards still tend to be from non-CEO backgrounds such as being experts in law or banking and from government or educational institutions. Thus we hypothesize that:

H1: In comparison with men, being an education professional, an executive in a non-profit organization or a public official will increase women's likelihood of corporate board membership.

Social categorization theory suggests that when compositional change is imposed upon a homogenous group there is a tendency to select the minority member most different from the majority group (Bettencourt, Dorr, Charlton & Hume, 2001; Mendonza-Denton, Park & O'Connor, 2008). This allows the majority group to continue to maintain their dominance (Leonardelli & Brewer, 2001; Bertola, Blau& Kahn, 2007). This may explain why women directors continue to be consistently different from the male director prototype and kept in minority numbers on corporate boards. Previous research has consistently found that women directors are younger and better educated (Hillman, Cannella & Harris, 2002) than their male counterparts. For these reasons, we hypothesize that:

H2: In comparison with men, being younger will increase women's likelihood of corporate board membership.

H3: In comparison with men, holding higher educational qualifications will increase women's likelihood of corporate board membership.

Previous experience on the board of a public corporation is the most desirable characteristic in any directorial candidate (Carpenter & Westphal, 2001). However, recent research has shown that the women directors are less likely to hold more than one corporate board seat than men directors are (McDonald & Westphal, 2013). Thus, when women hold such

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board experience, we hypothesize that it is likely to catapult them into further board memberships even more than men with similar experience:

H4: In comparison with men, previous public company board experience will increase women's likelihood of corporate board membership.

Experience on the boards of private companies, while providing valuable local knowledge, also maintains women's salient difference from the male members of the board who tend to occupy positions in public corporations. Adams and Flynn (2005) found that women outside directors who are professionals employed in private companies tend to be strongly embedded in their local social systems. Such experience may yield less valuable resources to public corporations that often have national and global operations. Thus, women with private board experience may have their differences further heightened from the normative public corporation experience of established (male) directors, which may contribute to why they are less likely to be selected. Thus, for reasons of heightened difference, we hypothesize that:

H5: In comparison with men, previous private company board experience will decrease women's likelihood of corporate board membership.

Professional Networks

There is extensive literature on the utility and importance of networks to various job-related outcomes from finding a job to wages to tenure and even effectiveness (Lin & Dumin, 1986; Geletkanyc & Hambrick, 1997; Seidel, Polzer & Stewart, 2000). Abundant anecdotal evidence exists of appointment to boards being partly a function of whom you know. Mills (1956) found evidence of this in letters written by Mr. Alfred Sloan, then chair of the board of General Motors Corporation, endorsing directorial candidates on the basis of their networks.

Mace (1971) similarly found that one of the informal practices in director selection is the influence of the CEO—more often than not, nominations for board membership go to those in the CEO's networks. For men, invitations to the board have been known to also originate in other associations, such as at college and/or through professional organizations such as government committees (Useem, 1984; Useem & Karabel, 1986). Lorsch (1989) also described the pathways of networks that lead to directorships. As recently as 2009, Hwang and Kim found that over 40% of the directors in their sample of over 1500 directors had third-party connections to the CEO. These findings cumulatively point to the critical importance of networks in obtaining directorships – for men. None of the studies cited above make particular reference to women directors.

Male directors, as has been well-documented, possess a great advantage in being members of the in-group and majority population (Ibarra, 1992, Burt, 1998). However, early studies of the members of the top management, suggests that at one point in time, men who lacked certain characteristics such as family connections, an Ivy League education and an arsenal of social connections were also disadvantaged for top management positions (Mills, 1956; Domhoff, 1967; Mace, 1971) – a state not very dissimilar to that of women today. Just as then for men, today networks of women professionals serve to signal the extent to which they are "socialized" into the masculine domain of organizational top management. Mills (1956: 139) said it best as, "To make the corporation self-perpetuating, the chief executives feel that they must perpetuate themselves … - future men not only trained but also indoctrinated". Women, socially constructed to be different than men and disadvantaged as being the "other" (Özbilgin& Woodward, 2004), may be further hampered by the absence of the "indoctrination" (socialization signaled by membership in powerful networks) identified by Mills (1956).

The literature on corporate directors' networks, however has generally been limited to studies of director interlocks (directors from one company who serve on the boards of other similar companies) between corporations (e.g. Davis, Yoo & Baker, 2003) or studies of interactions within a board (Mizruchi, 2004; Stevenson & Radin, 2009). While the literature on interlocking directorates has greatly enhanced our understanding of corporate strategy (Goodstein, Gautam & Boeker, 1994; Gulati & Westphal, 1999), corporate governance (Davis, 1996; Westphal, 1999), and how organizational practices propagate and spread (Davis, 1991; Haunschild & Beckman, 1998); it is organizational in scope. Thus, our awareness of the dynamics of intra-board activities has remained very limited. The importance of networks in understanding the mechanisms and outcomes of individual dynamics in the boardroom is evidenced by the focus on the social capital of top management teams. Interactions among board members have been found to create social capital for the board and affect its influence relative to and on the chief executive officer (CEO) (Zajac & Westphal, 1996; Stevenson & Radin, 2009). While important, the scope of studies pertaining to the social capital of board members is impeded by the difficulties of collecting network data from a large number of the population in the network of the respondent. Thus, quite often interlocking directorates or interlocks have been used frequently in lieu of directors' professional networks (Mizruchi, 1996; Daily, Dalton & Cannella, 2003). We are able to overcome these obstacles because professional networks, as conceptualized and constructed in the present study, are not based on individual choice of relationships but on the positions and attributes of colleagues in specific contexts.

Professional networks as defined in this study are structural ego networks in which the link or connection between nodes is common memberships in organizations. An ego network is a personal network; the owner of the network is referred to as the ego and members of the

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network are known as alters (Wasserman & Faust, 1994). The difference between professional networks as defined in this study—as *structural* ego networks—and social networks in previous literature is the absence of specifically defined relationships and exchanges, namely friendship, support or advice, between ego and alters which are traditionally measured in social networks. Professional networks as constructed in this study are ego networks in the sense that each network pertains to the connections of one individual, but they are also only structural in nature in that connections are based on common memberships in organizations between the ego and his/her alters and not on the ego's personal relationships or exchanges with alters such as friendship or transactions exchanging information.

Professional networks consist of the ego (the director from our sample whose network is being constructed) and alters who are her or his colleagues by virtue of memberships in the same organizations to which the ego belonged over her or his career. The professional network employed in this study is a map of the professional structure in which a director is embedded from the beginning of her or his professional (college) education to the time when the study was conducted. To illustrate with a simple example: suppose A's career has spanned 20 years and 6 companies, A's network comprises all contemporary connections over the 20 years and across the 6 companies. There are, as is warranted, rules that define alters. The rules of inclusion in the professional network are based on the notion of hierarchical similarity. Therefore, the nodes in A's network from the first company will include only those who were also in the same level as A; in order to ensure that the nodes in the network have the highest probability of actually being at least an acquaintance of or have recognition of A. On the basis of this rule, as A progresses in her or his career, the number of nodes decrease and probabilities of connecting increase. At the end of this process, the network of A as a member of the top management team includes those

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with whom A has studied, worked and/or socialized; and who are now also in the population of directors of corporations. As such, A is likely to have maintained at least acquaintanceship or be able to recognize alters in her/his professional network, in keeping with the norms of the group (Brass, Galaskiewicz, Greve & Tsai, 2004; Rivera, Soderstrom & Uzzi, 2010).

Thus the professional network is a map indicating the number and professional characteristics of the other inhabitants of the system—termed network *composition,* as well as the *structure* of the network including its size, the number of ties, the centrality of the director in her/his network, the constraint presented by the position and the relative value of alters in the network, and the extent of cohesion in the network, all of which serve to indicate whether they act as constraints or opportunity pathways in the structure of the network. The main elements – compositional and structural - that we study in the professional networks of directors follow.

Composition of the network. A primary assumption in constructing professional networks is with reference to their social capital constituents. If a network is construed foremost as a carrier of personal capital, then its primary components become those who can bestow such capital (Bourdieu, 1986). As such, professional networks comprise capital, in the form of alters, that egos acquire over the course of a career. The logic behind including all professional colleagues of the ego is that the owner of the network is not always explicitly cognizant of all those in her/his professional network and the myriad ways in which they contribute to outcomes. This phenomenon has been referred to as unmobilized social capital (Lin & Ao, 2008; Chua, 2011). Therefore, we have defined professional networks to include all professional colleagues of the ego. However, it is reasonable to differentiate between the extent to which different types of alters may contribute. For example, a CEO is much more likely to have an effect on an ego's outcomes than say a regional level executive. As such, we unpack these different influences as

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we investigate the effects of the composition of the professional network on the odds of board membership.

There is substantial evidence of the role played by the CEO in the nomination and selection of independent directors (Lorsch, 1989; Westphal & Zajac, 1995). Given the influence of the CEO on board invitations, whether direct or indirect (Shivdasani & Yermack, 1999), having CEOs in their network will facilitate board membership being acquired by women in organizations. Women belong to a lower status group in organizations, according to social identity and categorization theories (Ridgeway, 1993; Roth, 2004), increasingly more due to occupational segregation than being the demographic minority (Lyness & Thompson, 2000). Occupational segregation also means that women are considered unsuitable for top positions due to lack of experience in the core functions of the organization. In order to access higher positions, women need sponsors from among higher status groups in their networks (Lin & Dumin, 1986; O'Neil, Hopkins & Bilimoria, 2008). For women who are already in executive (top management team) positions, as is often essential to be considered for corporate board membership, such alters preferably are public company CEOs. Public company CEOs are superior constituents of social capital by virtue of their membership in the dominant group in organizations. Hence, it is public company CEOs in women's networks who will have the greatest impact on the likelihood of board appointments for them, such alters being members of the in-group who can serve as their sponsors (Moore, 1988; Kumra, 2010). Thus we expect that:

H6: In comparison with men, public company CEOs in a network will increase women's likelihood of corporate board membership.

Women in private companies are difficult to enumerate as private companies are not required to share as much information as is required of public companies. According to 2010

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data collected by the Bureau of Labor Statistics, there were 2,512,000 employees in 'Chief Executive' and 'General and Operations Manager' positions, of which approximately 27% (678,240) were women. Given this large number of women in senior management occupations and their relatively small representation in public companies, it is reasonable to infer that women are better represented in the senior managements of privately held corporations. Additionally there is evidence for the movement of women from public companies into private companies by way of entrepreneurship (Economist, 2005). Since organizational leadership is one of the prerequisites of board membership in public corporations, and such experience is not commonly available to women in public corporations, it is very likely that women may seek senior positions in private companies which are less affected by public perceptions of female leadership (Roth, 2004). As such, women directors of public companies may be more likely to have alters who are CEOs of private companies than their male counterparts whose career positions may have focused more on public corporations.

However, private companies vary greatly from public companies in their strategic operations, orientation, and regulation (Boot, Gopalan & Thakor, 2006). In this sense, in the professional networks of public company directors CEO alters from private companies will wield considerably lower leverage than CEO alters from public corporations. This is particularly true for women, as private company CEO alters will most likely corroborate existing perceptions of the "otherness" of women. The presence of private company CEO alters in a director's network will also indicate indoctrination of a different kind to that typically found valuable in public companies, which is likely to strengthen the perception of unsuitability of such women for board membership in public corporations. Hence:

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H7: In comparison with men, private company CEOs in a network will decrease women's likelihood of corporate board membership.

Structure of the network. Structural elements of the network of interest to us in this study are discussed below. The size of a professional network is indicative of two dimensions of a director's career: the number of companies that the sample director was associated with through her or his career and the size of such organizations. To illustrate, if A was educated at an exclusive college with a small student population, worked in one company until the year in which the sample was drawn, and is a member of one trade association and one charitable institution, then her network is bound to be far smaller than the network of another director in the sample, B, who attended a public university, held jobs in five different companies till the year in which the sample was drawn, is a member of five trade and business associations and sits on the board of five charitable institutions. The differential effect of the size of the networks of A and B is the degree of visibility afforded by the size as well as scope of the professional network. It is imperative to keep in mind that we are referring to opportunity and constraint structures; not the actual behavior of the individual with reference to such opportunities and constraints. Thus, the size of an individual's professional network is a threshold indicator of opportunities and constraints affected by the system in which an individual is embedded.

In the research pertaining directly to the career paths of women, there is evidence that few women rise to the top in a single company. Rather, women tend to move up the career ladder by changing organizations to get to the next higher step (Davies-Netzley, 1998; Lyness & Judeisch, 1999). Therefore, it is reasonable to infer that women who do reach the top of the organizational hierarchy may have done so through more job and organizational changes than

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similar men. Hence, it is plausible to hypothesize that the professional networks of women who have attained board director positions will also be larger than those of men in similar positions.

H8: In comparison with men, larger networks will increase women's likelihood of corporate board membership.

Granovetter's (1973) seminal paper and subsequent research has proved the importance of those who lie farther than the "close" network of family and proximate friends. More recently, Christakis and Fowler (2009) showed that several events in one's life occur due to the proximity and influence of the people who lie within three degrees in the person's network. Therefore, it is a reasonable inference that larger the size of the network, the more the number of people who lie within degrees and the greater the number of opportunities that can be availed of by the ego. The degrees of distance from the ego in the network is measured by the ties between the ego and alters and those among alters in the network. As such, ties become an indicator of the opportunities accessible to and constraints faced by the individual as a result of those directly accessible to the individual in her/his professional network.

H9: In comparison with men, more network ties will increase women's likelihood of corporate board membership.

While ties in general are conduits of resources in a network, actual access is indicated by the position of the individual in a tie. For instance, if A's network has twenty alters and has direct ties to ten of those alters, then A benefits more efficiently from those ten alters to whom A is directly connected than from the ten with indirect connections. Betweenness centrality is a measure of the number of times an ego lies between two nodes (Wasserman & Faust, 1994). Freeman (1977) found that those who occupy central positions are perceived to be more effective, leader-like and resourceful but its effect was later found to be marginal relative to

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actual position, rank and status (Sparrowe, Liden, Wayne, & Kraimer, 2001). Resources are not evenly spread in organizations, nor is their distribution static (Tsai, 2001). A person who is in a position of control today may be moved into a position that does not provide the same degree of access to resources. Therefore, a person who is situated on many paths is relatively less affected by such distribution and movements. Another way of looking at this is that people who hold central (betweenness) positions are perceived to be more influential due to their position in several paths.

For women directors, betweenness centrality can be indicative of access to and influence in groups that invariably includes the high-status men in the organization. In a study of the performance effects of network correlates, Cross and Cumming (2004) found that betweenness centrality significantly influenced performance due to the access to information and the types of information available to those who occupy more between positions in work groups. Though not a central finding, the same study found a strong positive correlation between gender and betweenness centrality in the information network. Therefore, women tend to occupy between positions and also benefit from it. Hence:

H10: In comparison with men, betweenness centrality will increase women's likelihood of corporate board membership.

Constraint is defined as the extent to which the ego is restricted, directly or indirectly, by the structure of the network (Burt, 1992). Here, the structure of the network refers to the relative position and strength of alters of the individual in her/his professional network. As an example consider A, who has X in her network. X happens to be the person through whom A is connected to a large number of alters in A's own network. It also so happens that in terms of characteristics (number of years of association in this study), X has strong connections to A's alters. In this

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situation, while it can be said that X is providing access to some alters of A, it can also be said that X is controlling A's access to A's own alters thereby acting as a constraint on A's access to A's own network. Imagine now, that A has another alter Y who is also connected to X's alters; now A can access those alters either through X or Y, therefore X's control over A's access to those alters is reduced to the extent of the strength of Y's connection to them. Burt (1998) found that members of minority groups benefitted by network constraint. That is to say, a female A is more likely to gain from her connection to a male X because he (X) acts not only as a connection but also as an endorsement. For a male A though, a male X is likely to be more of a constraint as X's endorsement is not as essential to a male A as it is to a female A who is a minority group member as a woman in top management. Legitimacy accounts for these opposite effects: in-group members are already legitimate and hence they do not need the sponsorship of more connected others in the network whereas outsiders need to be ratified by those who are more connected within the network (Brass, 1984; Burt, 1992; 1998). As such, the ego is then constrained in her or his access to resources of the network, by such alters. However, in these earlier studies, the women sampled were unlike those in our sample; i.e., they were not women in senior management and corporate director positions. Women's careers are different from men's in that women are more likely to progress through movement between organizations while men progress linearly within relatively fewer organizations (Lyness & Thompson, 2000). Consequently, the professional networks of women are composed of disparate groups belonging to the various organizations in which they were employed. Therefore, as positional networks, the professional networks of women are less constrained than that of women described in earlier empirical studies of relational networks (Ibarra, 1992; Burt, 1998). Since women at top management levels are likely to have greater legitimacy than women in lower positions, we

expect the high-level women in the present study to benefit from lower constraint. Thus we expect that:

H11: In comparison with men, network constraint will decrease women's likelihood of corporate board membership.

If structural holes bestow an advantage through non-redundancy of resources, cohesion signifies the advantage of trust, through redundancy. Densely connected networks advantage members of the network in two ways. Being a close-knit network, there are established norms of conduct and sanctions for non-conformance (Coleman, 1988). This builds trust within the network, which is essential in situations that are sensitive to environmental stress (Krackhardt, 1992). Second, for minority group members densely connected networks provide for multiple endorsements and validations. Burt (1998) referred to this as borrowed social capital. In the case of women and professionals who belong to minority racial/ethnic groups, merely knowing someone is not as much an advantage as when they provide a positive reference, a result possible only in the event of a strong connection. Thus we expect:

H12: In comparison to men, network cohesion will increase women's likelihood of corporate board membership.

METHODS

Data

Data on company directors were retrieved from Boardex, a commercial database on company boards. Boardex data includes demographic information of directors, including age, education (degree and institution), race, and sex, their professional credentials including companies, titles and periods, and non-occupational social membership information for members

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on the boards of companies featured on financial indices across the world. Boardex information is collected from numerous public sources such as legal filings, social registers and company announcements. The method of converting career biographical data into networks is described below.

Sample

The study's sample was constructed as follows. First, a list of all board appointments in companies on the annual *S&P* 500[2] lists between 2005 and 2010 was generated. From this list, only those boards that appointed at least one woman, in addition to men, were retained. The objective behind our sampling criteria was our primary interest in comparing the characteristics of women who got appointed to public boards to those of men who got appointed to the same board at the same time. In order to remove such respondents whose appointment would not be affected by network dimensions, nominations from institutional investors and founder families were removed from this list. The final list of directors comprised independent directors appointed through the routine nomination process. There were more men than women in the sample of 489 directors – 177 women and 312 men. Companies from finance, retail, technology and manufacturing sectors were represented in the sample.

Variables – Human capital

Human capital was measured by the following variables.

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2 The S&P 500, or the Standard & Poor's 500, is an American stock market index based on the market capitalizations of 500 large companies having common stock listed on the NYSE or NASDAQ.

Educational qualification was classified into three categories – undergraduate, graduate and post-graduate education.

Age was measured in years.

Profession was categorized by the primary position held by the directors for the ten years preceding the year from which the sample was drawn. That is, if the director was drawn from the list of companies that appointed both men and at least one woman in 2005, then profession was identified from the jobs held by the individual from 1995 to 2005. Six professions were identified – CEOs, Professional Directors (those who have been serving only as corporate board directors for the previous ten years), Independent Professionals and Entrepreneurs (e.g., self-employed professionals), Education Professionals, Non-profit Professionals and the final category of 'others' captured any profession that was not included in the five categories defined above, including government officials and defense personnel, among others. The primary position was identified from the jobs listed in the career biography of the individual as the job held for the longest and most recent duration in the preceding ten years. For example, if A was the President of a university as well as served on a two public company boards and one private company board during the past ten years, then A's profession was identified as an education professional. In the event of an individual being in more than one primary profession during the previous ten years, then the individual's profession was indicated by the last professional role they held.

Number of other public company boards was the number of boards of public corporations on which a director served, in her/his entire professional career until the year of sampling for this study. To illustrate, if A is a director in our sample from the list of companies that appointed men

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and at least one woman to its board in 2005, then all other public company boards that A served on until 2005 were counted in this variable.

Number of other private company boards was the number of boards of private corporations on which a director served in her/his entire professional career until the year of sampling for this study.

Variables – Professional Network

Network composition measures were:

Public company and private company CEO alters were calculated as the count of CEOs by type of company—public and private—in a director's professional network.

Measures of network structure calculated were:

Size: The total number of people in the network that a director is connected to, directly or indirectly.

Ties: The number of pairs that are connected in the network, whether or not they include the ego-director (i.e., the director whose network it is).

Centrality: The proportion of the number of times the ego-director lies on the shortest path between a pair of alters (the people in the ego-director's network) to the total number of direct paths between pairs, in the network.

Constraint: The extent to which the connections of the ego-director are connected to each other thereby reducing the influence of the ego-director over the actions of the others in her or his network. If an ego-director's connections are all connected to each other, then the ego-director is highly constrained in her or his network behavior. On the other hand, if the ego-director's connections are accessible to each other largely through the ego-director, then the ego-director

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has greater freedom in her or his own network behavior as well as that of her or his connections. As a result, such an ego-director is less-constrained.

Cohesion: The proportion of triads to possible triads (i.e., dyads) in the network. In a valued, non-directional network, transitivity (which is a measure of cohesion) indicates how many adjacent edges are connected to each other. Triads indicate closed sub-groups, while dyads indicate open sub-groups. The proportion of closed sub-groups indicates the extent to which the network is close-knit.

Analytical Procedure

Each network was analyzed with UCINET (Borgatti, Everett & Freeman, 2002), a widely used network analysis software program, to obtain measures of network composition, cohesion and structural holes. After network measures were obtained from UCINET for each director in the sample, they were included in a dataset that contained demographic variables such as age, education level, years of non-director experience, and profession of the egos who comprise the sample of the study. Therefore, the final dataset for this study contained human capital and professional network data for the 489 members of the sample. This was the final dataset used for statistical analysis using SPSS.

Due to the highly collinear nature of the data, first a principal component analysis was performed in order to obtain the most suitable subset of variables to evaluate the study's hypotheses. For instance, there were three measures of centrality, two measures (density and transitivity) of the connectedness of the ego, and three measures of the advantage accrued to the ego from its own and alters' network position (hierarchy, indirect ties, and constraint). However, these are not measures that are equal or the same, disallowing the possibility of combining them

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into factors. Consequently, the multicollinearity diagnostic routine of OLS regression was used to identify the set of variables that satisfied the criteria set out in the hypotheses as well as conditions of non-multicollinearity.

Since the research question was whether human capital and network variables would affect the odds of directorship differently for men and women, the statistical method employed was binary logistic regression. This method is also better suited to the data at hand because the independent variables cannot be said to be completely independent of each other. Since logistic regression analysis was developed for the express purpose of testing for categorical dependent variables, it does not require the fulfillment of the assumptions of OLS regression analysis (Hosmer & Lemeshow, 2000).

RESULTS

Table 1 shows the means, standard deviations and correlations of the continuous variables of the study. Table 2 reports the tests of equality of means for two independent samples. This is an appropriate test because female and male board members are drawn from different populations and the selection of one has no bearing on the selection of the other except in terms of the numbers of either. Therefore, though the number of vacancies and the decision on the number of women to be appointed to the board affects the number of men, the candidates are essentially independent of each other. The results of the T-Tests show that the female and male board appointees in this study differed significantly only in terms of age (women appointees were younger than men appointees), experience on other private company boards (women appointees sat on fewer private company boards than men appointees), and the number of ties in

the professional network (women appointees had fewer ties in their networks than men appointees).

<center>--------------------------------
Insert Tables 1 and 2 here
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The relative likelihood of female board membership (compared with male board membership) in public corporations was assessed using a logistic regression with female board membership as the dependent variable and human and professional network capital variables as independent variables. The results of the logistic regression of women's likelihood of board membership are shown in Table 3. Table 4 summarizes the results of the tests of the specific hypotheses.

<center>--------------------------------
Insert Tables 3 and 4 here
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The final logistic regression model in Table 3 was very well-specified with a statistically significant Chi-Square statistic of 51.455 with a p value less than 0.0001, as well as a Hesmer-Lemeshow goodness-of-fit statistic of 3.044 with 8 degrees of freedom and p value of 0.932 (Hosmer & Lemeshow, 2000). Despite this, the final model was able to predict female board membership correctly only in 28% of the cases; it was able to predict male board membership correctly in 89% of the cases. Human capital variables were found to be more effective in predicting the board membership of women, with age and being a public official (i.e., a government employee) being significant as expected in Hypotheses 1 and 2. Among professional network variables, only the number of ties (Hypothesis 9) and the degree of cohesion (Hypothesis 12) were significant in predicting the relative likelihood of female board membership on public corporations as summarized in Table 4.

<center>24</center>

Director age was a significant factor with B= -0.07; $p < 0.001$; Exp(B)=0.93 value indicating that for every unit decrease in age, the likelihood of board membership increases by nearly ten percent. This confirms findings of earlier research (e.g., Furst & Reeves, 2008) that women who ascend to high-level organizational leadership positions tend to be those who have achieved professional competence at least equivalent to that of men but at a younger age. In terms of profession, in relation to the comparison category of being a CEO, being an education professional (B=1.13; $p < 0.05$; Exp(B)=3.09) or a public official (B=1.58; $p < 0.001$; Exp(B)=4.86) greatly improved the likelihood of board membership for women by three and nearly five times respectively relative to the likelihood of a male education professional or public official being selected to a public company board.

The number of ties in women's professional networks (B= 0.01; $p < 0.05$; Exp(B)=1), and the degree of cohesion in women's professional network (B= 0.02; $p < 0.05$; Exp(B)=1.02) have positive and statistically significant but negligible effects on their odds of corporate board membership. Though negligible, in view of the low chances of women to be appointed to public company boards (given the very small proportion of women on the boards of public companies), even a negligible increment of 0.02 units in the degree of cohesion in the professional network improves the chances of the woman being appointed to the board of a public company by 2%. This is borne out by the Nagelkerke R square[3], a measure of the effect of independent variables, which indicates the magnitude of influence of the independent variables on the predictive capability of the model. The increment in the Nagelkerke R square for the step in which structural elements of the professional network were entered in the model is 0.03. In itself, this increment may seem insignificant but when taken relative to the total effect accounted for by the

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[3] A pseudo R square value, akin to the R square calculated during OLS regression, applicable for logistic regression (Hosmer & Lemeshow, 2000)

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model (i.e., 0.135), it is not trivial. Therefore, there is evidence of the suitability of the network structure variables for the model as well as of their explanatory capability.

As a *post hoc* analysis, we also performed a linear regression with the number of public company board appointments as the dependent variable and human capital and professional network variables as independent variables. The dependent variable was defined as the total number of public company boards a director had served on in their career including the current board (i.e., the number of previous public company boards on which a director served + 1). We tested for the assumptions of normality and found that the variables indicating the number of private company board appointments, network size and network ties did not conform to a normal distribution. These variables were adapted for the regression equation by a log transformation. We also found that the variable network constraint was highly collinear with the dependent variable, the number of public company board appointments. This is not surprising because the higher the number of public company board appointments, the greater the number of highly connected alters we can expect to be present in the professional network. For this reason, we removed the variable network constraint from the linear regression model. There was no change in R^2 and Adjusted R^2 after removing this variable from the model. We separated the samples of men and women in order to understand the differential effects better than that explained by the combined sample model. Results of the linear regression are shown in Table 5.

Insert Table 5 here

The *post hoc* linear regression model shows that being a public official (β_{women}=1.43, p < 0.001; β_{men}=0.94, p < 0.05), experience on the boards of private companies (β_{women}=0.55, p < 0.001; β_{men}=0.89, p < 0.01), the number of public company CEOs in the professional network

(β_{women}=0.62, β_{men}=0.53; p < 0.001) and the number of private company CEOs in the professional network (β_{women}=0.31, β_{men}=0.27; p < 0.01) have nearly the same effect on the number of board appointments held by both men and women. In terms of other professions, in relation to the comparison category of CEO, men benefit from being professional directors (β_{men}=0.80; p < 0.05) and were disadvantaged by being nonprofit executives (β_{men}= -1.02, p = 0.05). Women, on the other hand, benefitted from being public officials/governmental employees (β_{women}=1.43, p < 0.001).

The results of the simple regression presented in Table 5 corroborated the results of the earlier logistic regression (Table 3) to a certain extent, and also went further to explain the results of the logistic regression. The R^2 for the model run on the sample of women directors was 0.67, whereas the R^2 for the same model run on the sample of men directors was 0.71; this suggests that the model specifies the independent predictors of the number of public company board appointments held by men better than it does for women. Further, an examination of the variable effects shows that while the number of public company board appointments held by men was positively impacted by the number of other (private) board appointments they held, this effect did not occur for women. An interesting result of the within-sex *post hoc* analysis of women directors was the non-significance of age and being an education professional, both of which were significant variables in the primary analysis comparing women's and men's odds of corporate appointment. The conclusion we can draw from this is that while in comparison to men candidates being younger and an education professional are advantages for women (see Table 3), among women candidates neither is an advantage (see Table 5). Among women candidates, holding the profession of a public official was considered the most desirable profession compared to the category of being a CEO. Also, women who had more private board

experience, and had more public and private company CEOs in their networks were more likely to serve on public company boards.

Network structure variables were not seen to be significant in the *post hoc* within-sex analyses (Table 5) although network ties and cohesion were found to be significant in the primary cross-sex analysis (Table 3). This is also suggestive of the differential importance of networks; they are important in the comparison of women and men directors but it appears that network structure does not distinguish selection within each group.

In summary, the results of our T-test analyses suggest that there are few differences between male and female board members in terms of their human capital and professional networks, yet these variables seem to affect the odds of board membership for women differently than for men. Both primary and *post hoc* analyses indicate that although men and women directors are essentially similar, the criteria for their board appointments are differently nuanced. Particularly with regard to the explanatory power of human capital and professional network variables, the results indicate that other variables may need to be taken into consideration in order to fully understand the factors that affect the odds of female board membership. Evaluation and elaboration of the effects found in this study and further improvements to the models are discussed below.

DISCUSSION

As noted in recent reviews by Withers et al (2012) and Johnson et al (2012), research on women on corporate boards has focused mainly on the human capital characteristics of women directors. Few studies have taken their networks, social or professional, into consideration. Despite these constraints, there is sufficient evidence that not only human capital (personal

characteristics such as age, education, and profession) but also social capital (those to whom and the manner in which directors are in some way connected) are important factors in board appointments (Sheridan & Milgate, 2005; Westphal & Stern, 2006). Yet, the means to capture and analyze network data have been elusive due to the nature of the role of board members. Hence, there is scant information regarding the networks of board members and a distinct lacuna in knowledge of the effects of such networks on the corporate board appointments of women and men.

This study is an attempt to bridge this gap through an innovative use of data available through secondary sources which draw on the career histories of corporate board members. Information about who worked with a corporate board director, when, where, and in what capacity throughout the director's career enabled the construction of what is presented here as a professional network. A professional network was conceptualized in this study as a structural network of colleagues who held common memberships in the same organizations during the same periods. For corporate directors colleagues may be conceived of as resources in the professional realm, supporting a resource-based view of board composition as it implies that the resources of board members become available to the boards to which they are appointed. The present study investigates the relative importance of human capital and professional network variables for the appointment of board members. Two analyses were used to examine this research question—a logistic regression analysis which indicated how women's and men's human capital and professional networks influence their board appointments, and separate linear regression models for men and women directors which indicate how these variables affect the board appointments for men and women independently.

The findings of the study indicate that a woman's profession, and to a lesser extent certain characteristics of her professional network, significantly impact her chances of being appointed to a corporate board. The results show that the factors that contribute to corporate board membership for women are not the same as those for men, indicative of the differential effects that a comprehensive set of human capital and professional network variables have on the ability to predict board membership for women and men. The model was able to predict board membership for women correctly in only 28% of the cases, whereas men appointed to the same boards at the same time were classified correctly in 89% of the cases. From this, we may conclude that while men's human capital and professional network characteristics almost fully explain their selection to corporate boards, clearly the bulk of the criteria that influence the corporate board selection of women lie outside their human capital and professional network characteristics. That is, in comparison with their male counterparts who were appointed at the same time for the same boards as they were, women directors' human capital and professional network characteristics simply do not as fully explain their appointment. We speculate that the outside factors that appear to preponderantly drive the appointment of women directors on corporate boards may include the regulatory, legislative, and public relations pressures felt by corporate boards to diversify through the inclusion of women directors. That is, while men appear to be appropriately selected to join corporate boards on the basis of the quality of their individual human capital and professional network characteristics, women appear to be appointed to corporate boards more on the basis of their group membership (i.e., as women) than the quality of their individual characteristics. This finding suggests that sex typing continues to prevail in the workplace, even in the selection of candidates for premier corporate positions such

as seats on boards of directors. Unfortunately, being a woman appears to far overshadow individual qualifications in women's appointment to corporate boards of directors.

Within-group analyses of the importance of human capital and professional network characteristics employed in the appointment of women and men directors revealed that predominantly the same set of criteria are associated with the number of corporate board memberships held by women and men. That is, holding the profession of public official (as compared with the profession of CEO), having experience on private company boards, and having public and private company CEOs in a director's network were positively associated with holding multiple board memberships for both women and men directors. However, in comparison to being a CEO, certain professions advantaged (being a professional director) or disadvantaged (being a nonprofit executive) male directors alone.

The study's findings point to the overwhelming importance of a woman's profession for her appointment on a corporate board. Previous studies that have examined the impact of profession on board membership for women have found that the education and nonprofit sectors tend to be the occupational sectors from which women ascend to boards (Harrigan, 1981; Kesner, 1988). Our results showed that education-related professions continue to positively influence women's odds of board membership. That is, in relation to the comparison category of being a CEO, a woman coming from the education sector is more than three times more likely than a man from the education sector to be appointed to a corporate board. However the results also indicate a change in the influence of nonprofit-related occupations as a source of women directors. Nonprofit organizations appear to have been replaced by public office/governmental positions as viable sources of women directors. In fact, in relation to the comparison category of being a CEO, a woman coming from public office/governmental service is almost five times

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more likely than a man from a similar profession to be appointed to a U.S. corporate board. This result suggests that the contacts, resources and influence offered by holding public office and governmental positions are most highly sought in women directors as compared with the category of holding the profession of CEO. The results also indicate that being a nonprofit executive is not as detrimental for women's board appointment as it is for men's in relation to the comparison category of being a CEO. However, being a professional director (as compared to being a CEO) significantly benefits men only. The finding that being a professional director is not a significant contributor to the number of board appointments held by women is further evidence of the findings by Westphal and McDonald (2013) that women and minority group members are less likely to be considered for multiple board appointments.

With regard to the composition and structure of directors' professional networks, we found that overall the professional networks (i.e., mappings of overlapping memberships in organizations) of women were smaller than those of men. While this cannot be construed as a comment on the social capital (relationships and exchanges) of directors given the non-relational nature of the professional networks constructed in the present study, there is still the implication that women do not create networks around them in the same magnitude as men. In terms of professional networks as predictors of the number of board appointments in public companies, we found significant effects from the composition of the network in the within-sex analyses of the samples of women and men. The presence of CEOs, of both public and private companies, in the professional network, contributed positively (and about equally) to the number of board appointments of both men and women. Certain structural characteristics of professional networks (i.e., network ties and cohesion) were also shown to positively increase the odds of women's board membership as compared with men's. However, the magnitudes of the significant effects

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obtained in Table 3 were extremely small, and within-group significances in Table 5 were not found for network structure variables, making it difficult to draw substantive conclusions about the influence of these variables.

Study Limitations and Future Research

Due to logistical difficulties in obtaining data pertaining to the actual networks of board members, most research on board composition has not included direct measures of corporate directors' social capital. A limitation of the present study is that our conceptualization of professional networks as overlapping organizational memberships with others over a director's career cannot be translated to direct measures of social capital. Overestimation is a likely and valid criticism of this basis of network construction. As per the norms of exchange, information possession and transmission are unequal processes imposed upon both by temporality and embeddedness in the structure (Raub & Weesie, 1990). Hence, it is plausible that an individual may be in a position to possess resources but unable to transfer them (and vice versa) at different points in time depending on their network position. However, given how little is known of network activity in the uppermost echelons of organizations, overestimation may be less of a concern than missing vital network links.

Greater explanatory capability of the network structure variables may be realized by refining the design of the professional network, assigning direction and weight to connections based on relevant parameters such as hierarchical level, length of association and possibly the various types of organizations through which people may be associated. Given the magnitude of the effects contributed by directors' professions, there is potential to specify the model better by defining the profession variable in greater detail, possibly by differentiating between the role and

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area of expertise. Additionally, it may be illuminating to explore other similarities between the ego director and their network connections than merely those by proximity (common membership) in an organization. The times or locations at which the most beneficial connections emerge over a career is another interesting area of further research – for example, are connections formed during higher education or in early career stages more instrumental for director appointment than those formed in mid-career stages in the workplace?

Finally, given the wealth of biographical and other data available through the internet there is potential for exploring different designs of the professional network structures of corporate board members. The nature of the connections in director networks could be conceptualized in many different ways depending on the research questions being examined, for example to include only such colleagues as are in the same role, profession, or area of expertise. The design flexibility offered by the present study's innovative methodology of constructing directors' professional networks on the basis of easily available biographical data opens up future research in the area of the networks of corporate board members. The availability of technology and the increasing comfort with sharing information online provide strong potential for future research into the networks of hitherto nearly impossible to access populations such as corporate board directors and top executives.

Table 1
Descriptive Statistics and Correlation Coefficients

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Sex	0.37	0.48																			
2. Age	54.56	7.09	-0.17**																		
3. College Graduate	0.25	0.43	0.01	-0.04																	
4. Graduate Degree	0.63	0.48	-0.06	-0.03	-0.76**																
5. Doctoral Degree	0.12	0.32	0.07	0.10*	-0.21**	-0.48**															
6. CEO	0.73	0.45	-0.07	-0.21**	0.08	0.09*	-0.25**														
7. Professional Director	0.05	0.21	-0.03	0.16**	0.03	-0.01	-0.02	-0.36**													
8. Independent Professional	0.10	0.30	-0.01	-0.02	-0.07	0.05	0.02	-0.55**	-0.07												
9. Education Professional	0.05	0.21	0.09*	0.14**	-0.04	-0.19**	0.34**	-0.36**	-0.05	-0.07											
10. Public Official	0.05	0.23	0.11*	0.09*	-0.02	-0.02	0.05	-0.39**	-0.05	-0.08	-0.05										
11. Nonprofit Executive	0.02	0.15	-0.03	0.10*	-0.06	-0.06	0.16**	-0.25**	-0.03	-0.05	-0.03	-0.04									
12. Number of Public Company Boards	3.04	2.38	-0.07	0.30**	-0.09*	0.06	0.04	-0.18**	0.19**	0.09*	0.04	0.05	-0.05								
13. Number of Private Company Boards	2.37	2.51	-0.11*	0.12**	-0.05	0.06	-0.02	-0.11*	0.06	0.09*	0.00	0.05	-0.02	0.42**							
14. Number of Public Company CEOs in the Network	2.75	2.82	-0.05	0.31**	-0.09*	0.12*	-0.05	-0.05	0.15**	0.03	-0.01	-0.07	0.01	0.76**	0.23**						
15. Number of Private Company CEOs in the Network	0.46	0.87	-0.03	0.11*	0.03	-0.01	-0.04	0.07	0.07	-0.07	-0.01	-0.06	-0.08	0.25**	0.25**	0.14**					
16. Network Size	90.63	87.04	-0.02	0.13**	-0.06	0.03	0.04	0.03	-0.04	-0.07	0.01	0.07	0.01	0.33**	0.03	0.44**	0.08				
17. Network Ties	6799.20	22847.34	-0.06	0.05	-0.04	0.03	0.00	-0.02	-0.05	0.00	-0.04	0.10*	0.04	0.03	-0.04	0.09*	-0.02	0.81**			
18. Network Centrality	3595.75	7850.61	-0.01	0.15**	-0.04	0.04	0.00	-0.05	-0.01	0.00	0.05	0.06	-0.02	0.45**	0.13**	0.56**	0.13**	0.82**	0.63**		
19. Network Constraint	0.47	7.68	-0.03	0.01	0.08	-0.06	-0.02	0.03	-0.01	-0.01	-0.01	-0.01	-0.01	0.03	0.01	0.05	0.03	0.05	-0.01	0.08	
20. Network Cohesion	62.77	15.76	0.05	-0.03	-0.01	0.00	0.02	-0.07	-0.07	0.08	0.01	0.06	0.05	-0.33**	-0.19**	-0.39**	-0.16**	0.01	0.32**	0.01	-0.01

n = 494
** p < 0.01 level (2-tailed)
* p < 0.05 level (2-tailed)

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Table 2
Group Means and T-Tests

Independent Variables	Sex	N	Group Statistics		T-test for Equality of Means
			Mean	S.D.	T
Age	F	177	52.92	6.18	-3.91***
	M	312	55.49	7.44	
Number of Public Company Boards	F	177	1.77	2.06	-1.84
	M	312	2.18	2.52	
Number of Private Company Boards	F	177	0.80	1.50	-3.62***
	M	312	1.58	2.66	
Number of Public Company CEOs in the Network	F	177	2.53	2.47	-1.27
	M	312	2.86	3.01	
Number of Private Company CEOs in the Network	F	177	0.40	0.86	-1.03
	M	312	0.48	0.84	
Network Size	F	177	84.47	65.34	-0.92
	M	312	91.74	92.63	
Network Ties	F	177	3486.81	5171.74	-2.20*
	M	312	7835.36	25950.59	
Network Centrality	F	177	3096.43	5440.68	-0.78
	M	312	3648.60	8439.08	
Network Constraint	F	177	0.12	0.13	-0.76
	M	312	0.67	9.67	
Network Cohesion	F	177	63.56	14.84	0.93
	M	312	62.20	16.07	

999   p < 0.05*
*** p < 0.01*
**** p < 0.001*

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Table 3

Logistic Regression Model for the Effects of Human Capital and Professional Networks on the Likelihood of Board Membership for Women as Compared to Men

Independent Variables	B	S.E.	Exp(B)
Age	-0.07***	0.02	0.93
College Graduate (comparison category)			
Graduate Degree	-0.11	0.23	0.90
Doctoral Degree	0.22	0.38	1.24
CEO (comparison category)			
Professional Director	0.39	0.51	1.48
Independent Professional	0.25	0.34	1.28
Education Professional	1.13*	0.52	3.09
Public Official	1.58***	0.47	4.86
Nonprofit Executive	-0.09	0.75	0.91
Number of Public Company Boards	-0.11	0.08	0.90
Number of Private Company Boards	-0.08	0.05	0.92
Number of Public Company CEOs in the Network	0.07	0.07	1.07
Number of Private Company CEOs in the Network	0.08	0.12	1.08
Network Size	0.01	0.00	1.01
Network Ties	0.01**	0.01	1.00
Network Centrality	0.00	0.00	1.00
Network Constraint	-0.28	0.87	0.76
Network Cohesion	0.02*	0.01	1.02
Nagelkerke R^2	0.135		
Goodness-of-fit Measures			
Hosmer-Lemeshow Test Coefficient	3.044 (p = 932)		
Chi-Square Test of Model Coefficient	51.455***		

n = 494

*   *p < 0.05*

**   *p < 0.01*

*** *p < 0.001*

Classification Table			
Observed	Predicted		Percentage Correct
	Male	Female	
Male	278	34	89.1
Female	132	50	27.5
Overall Percentage			66.4

Table 4
Summary of the Hypotheses Tested in the Logistic Regression Model

Hypotheses	Result
H1: In comparison with men, being an education professional, an executive in a non-profit organization or a public official will increase women's likelihood of corporate board membership.	Partially supported
H2: In comparison with men, being younger will increase women's likelihood of corporate board membership.	Supported
H3: In comparison with men, holding higher educational qualifications will increase women's likelihood of corporate board membership.	Not supported
H4: In comparison with men, previous public company board experience will increase women's likelihood of corporate board membership.	Not supported
H5: In comparison with men, previous private company board experience will decrease women's likelihood of corporate board membership.	Not supported
H6: In comparison with men, public company CEOs in a network will increase women's likelihood of corporate board membership.	Not supported
H7: In comparison with men, private company CEOs in a network will decrease women's likelihood of corporate board membership.	Not supported
H8: In comparison with men, larger networks will increase women's likelihood of corporate board membership.	Not supported
H9: In comparison with men, more network ties will increase women's likelihood of corporate board membership.	Supported
H10: In comparison with men, betweenness centrality will increase women's likelihood of corporate board membership.	Not supported
H11: In comparison with men, network constraint will decrease women's likelihood of corporate board membership.	Not supported
H12: In comparison to men, network cohesion will increase women's likelihood of corporate board membership.	Supported

Table 5
**Linear Regression Model for the Effects of Human Capital and Professional Networks on
Total Number of Public Company Board Appointments for Men and Women**

Independent Variables	Women		Men	
	B	S.E.	B	S.E.
Age	-0.01	0.02	0.01	0.01
College Graduate (comparison category)				
Graduate Degree	-0.13	0.23	0.00	0.20
Doctoral Degree	0.58	0.34	0.57	0.32
CEO (comparison category)				
Professional Director	0.75	0.51	0.80*	0.38
Independent Professional	0.92	0.34	0.31	0.28
Education Professional	-0.07	0.44	0.93	0.48
Public Official	1.43***	0.37	0.94*	0.45
Nonprofit Executive	-0.31	0.79	-1.02*	0.53
Log of Number of Private Company Boards	0.55**	0.17	0.89***	0.12
Number of Public Company CEOs in the Network	0.62***	0.06	0.53***	0.04
Number of Private Company CEOs in the Network	0.31**	0.11	0.27**	0.10
Log of Network Size	-0.00	0.00	0.00	0.00
Log of Network Ties	-0.05	0.12	-0.09	0.10
Network Centrality	0.01	0.06	0.03	0.05
Network Cohesion	0.01	0.01	-0.01	0.01
R^2	0.67		0.71	
Adjusted R^2	0.64		0.69	

n(Women) = 180; n(Men) = 306
*   p < 0.05
**   p < 0.01
*** p < 0.001

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