

## ORGANIZATIONAL PREDICTORS OF WOMEN ON CORPORATE BOARDS

AMY J. HILLMAN  
CHRISTINE SHROPSHIRE  
Arizona State University

ALBERT A. CANNELLA JR.  
Tulane University

**Women are increasing in number among corporations' boards of directors, yet their representation is far from uniform across firms. In this study, we adopted a resource dependence theory lens to identify organizational predictors of women on boards. We tested our hypotheses using panel data from the 1,000 U.S. firms that were largest in terms of sales between 1990 and 2003. We found that organizational size, industry type, firm diversification strategy, and network effects (linkages to other boards with women directors) significantly impact the likelihood of female representation on boards of directors.**

In 2005, women made up 37 percent of the managerial work force, according to the U.S. Bureau of Labor Statistics, yet held only 14.7 percent of the board seats in *Fortune* 500 companies (Catalyst, 2005). Frequent headlines in the popular press call for increased diversity in corporate America (e.g., Blackman, 2004; Browder, 1995; Gasparino & Boyce, 1998), and institutional investors increasingly press for female directors (e.g., Singh, 2005). Further, recent empirical evidence links gender diversity on boards with improved financial performance (e.g., Carter, Simkins, & Simpson, 2003; Erhardt, Werbel, & Shrader, 2003). Given these statistics and pressures for greater female representation, why do some organizations have women on their boards of directors but others do not?

Scholarly research in the area of female representation on boards provides little guidance for answering this question. Although a large body of research studies board diversity and demography, this literature focuses on functional background, age, and tenure, but rarely gender. The research that does examine gender has been primarily conducted at the work group level (e.g., Cox & Nkomo, 1991; Milliken & Martins, 1996), in settings far different from boardrooms.

The small amount of work directly focused on female representation in large corporations casts a wide net of inquiry, although none focuses on organizational predictors of female representation on boards of directors. Scholars have compared female representation in boardrooms over time (Daily, Certo, & Dalton, 1999) and on board committees (Bilimoria & Piderit, 1994; Kesner, 1988), explored

whether and how female and male directors' demographic characteristics differ (Hillman, Cannella, & Harris, 2002), studied how female executives facilitate board appointments through CEO ingratiation (Westphal & Stern, 2006), and examined how female directors can gain influence through experience and network ties (Westphal & Milton, 2000). Thus, scholarly knowledge is limited to studies taking female representation on boards of directors as exogenous or exploring individual-level advancement or influence rather than asking whether organizational characteristics are predictive of gender diversity. Studying individual characteristics and behaviors of female directors can yield insight into how specific women advance into the boardroom, but it cannot answer the question of why some firms have female directors and others do not.

Focusing on organizational characteristics that are predictive of women on corporate boards, on the other hand, allows us to systematically explore under what conditions a firm's board is more likely to include female directors. Recognizing that organizations are open systems interdependent with external entities, resource dependence scholars have argued that directors should reflect organizational dependencies (e.g., Boyd, 1990; Daily, Dalton, & Cannella, 2003; Dalton, Daily, Johnson, & Ellstrand, 1999). Scholars in this tradition emphasize the resources and benefits that connections with other firms made via board members bring to organizations (Pfeffer, 1972; Pfeffer & Salancik, 1978; Selznick, 1949). By identifying firm characteristics or conditions under which specific interfirm links are more beneficial, resource dependence logic can

thus provide a helpful framework for understanding what types of directors can benefit a firm most.

Resource dependence theory scholars, however, have primarily focused on how directors' occupational and functional experiences match the needs of organizations (e.g., Hillman, Cannella, & Paetzold, 2000; Pfeffer, 1972) instead of on gender. Thus, we sought to make two important contributions to theory with our approach. First, we explored resource dependence theory as it applies to director gender. To do so, we combined resource dependence with work-group-level diversity theories and findings to identify potential benefits of female representation on boards of directors. Our focus on gender is a unique complement to resource dependence research focused on occupational and functional differences among directors. Second, we derived an initial set of organizational predictors of gender diversity in the boardroom by linking the benefits of such diversity with specific organizational characteristics. Ours is one of the first such studies we are aware of that seeks to explain what organizational factors predict females in the boardroom.

Although we adopt resource dependence theory as our overarching theoretical framework, it is also important to recognize the limitations of its focus on environmental dependencies. Internal organizational factors (e.g., organizational culture, human resource practices, and leadership) are also likely predictors of female representation on boards and remain unexplored in the literature, but we leave this exploration to subsequent studies guided by other theoretical lenses.

We begin our more detailed arguments with a brief review of resource dependence theory, outlining how boards of directors function as a linkage mechanism. We then integrate group-level work on gender diversity to hypothesize organizational conditions under which the benefits from female representation on a board are most valuable. Then we describe our methodology, analyses, and results before discussing the implications of our findings for scholarly research and practice.

## RESOURCE DEPENDENCE AND FEMALE REPRESENTATION ON BOARDS

### Linkage Benefits from Boards of Directors

Resource dependence theory (Pfeffer, 1972; Pfeffer & Salancik, 1978) emphasizes the interdependence between organizations and entities in their external environment that control important resources. A key insight of this perspective is that organizations are open systems, dependent upon

external entities for survival, and that the resulting uncertainties pose significant challenges and costs to the organizations (Pfeffer, 1972). Pfeffer and Salancik (1978) developed the idea that a firm can form links with elements of its external environment upon which it depends to reduce dependency and obtain resources. Boards of directors are a primary linkage mechanism for connecting a firm with sources of external dependency. By selecting a director with valuable skills, influence, or connections to external sources of dependency, the firm can reduce dependency and gain valuable resources. As environmental dependencies change, so do the resource needs for organizations and thus the needs for specific types of directors (e.g., Hillman et al., 2000). Implicit in this view is the assumption that firms better able to deal with environmental uncertainty and interdependence also perform better (Dalton et al., 1999).

Pfeffer and Salancik proposed that organizations can accrue three specific benefits from board linkages: (1) advice and counsel, (2) legitimacy, and (3) channels for communicating information and for gaining preferential access to commitments or support from important elements outside a firm (1978: 145, 161). Hillman and Dalziel (2003) categorized the sources of these benefits as directors' human capital (e.g., expertise, skills, knowledge, and reputation) and relational capital (e.g., resources available through a network of relationships). Studies of the firm-level benefits of directors' human and relational capital represent a rich and growing research stream (e.g., Boyd, 1990; Carpenter & Westphal, 2001; Westphal, 1999) and provide evidence of Pfeffer and Salancik's (1978) board of director linkage benefits.

Regarding the first benefit, boards' provision of advice and counsel, we note that directors' tasks are nonroutine and involve "big picture" issues rather than day-to-day operational issues. Boards set the parameters within which strategic decision making occurs (Mizruchi, 1983), are often involved in strategy initiation (Haunschild, 1993), and participate in all phases of a firm's strategic development process (Johnson, Daily, & Ellstrand, 1996). However, boards also meet infrequently, have limited information about the firm, and have little involvement in strategy implementation. Because of their fiduciary responsibility to shareholders as overseers of management, boards are often characterized as active questioners of management and the status quo (Johnson et al., 1996), but their limits as overseers are also often acknowledged (Daily et al., 2003). Empirical studies have confirmed that directors do provide valuable advice and counsel to

the firms they serve (Baysinger & Butler, 1985; Carpenter & Westphal, 2001; Westphal, 1999).

Providing a second category of benefits, directors lend legitimacy to organizations (Bazerman & Schoorman, 1983; Daily & Schwenk, 1996). In this focus on legitimacy, resource dependence theory mirrors institutional theory (Meyer & Rowan, 1977; Scott, 1995) in that legitimacy and conformity to societal expectations are considered key components of organizational survival in both theories. As Suchman (1995) pointed out, resource dependence scholars view legitimacy in terms of the pragmatic, instrumental ways whereby an organization sets out to gain legitimacy by responding to the demands of its key constituents. Directors of large corporations are highly visible to societal actors who grant legitimacy and who are influenced by prestige, such as institutional investors, and thus directors can legitimize firms (Certo, 2003; Davis & Mizruchi, 1999).

The final benefit Pfeffer and Salancik (1978) identified is provision of channels of communication to external entities and gaining influence, support, commitment, or favorable access to resources via these channels. Researchers have found that valuable information is disseminated between firms through boards (Burt, 1980; Haunschild & Beckman, 1998) and that boards are helpful in acquiring resources from important external sources of dependency (Boeker & Goodstein, 1991; Stearns & Mizruchi, 1993; Zald, 1969).

### **The Benefits of Female Representation on Boards of Directors**

Having outlined the board of directors linkage benefits from resource dependence theory, we now consider the effects of female representation on these benefits. Although we continue to examine each benefit separately for ease of discussion, we recognize that in practice they are not mutually exclusive (i.e., a director can provide advice, legitimacy, and favorable access to resources). An equally important recognition is that although female representation on a board may result in any or all of these benefits, a firm may purposefully select a female director purely for advice and counsel, yet also benefit from the legitimacy or access to resources she lends to the organization. Pfeffer and Salancik (1978) and others since (Ibarra, 1992, 1993) have recognized the tendency to select new group members who resemble an existing group, labeling this tendency "homophily." Pfeffer and Salancik (1978: 236–237) contended, however, that "for either intended or unintended reasons, the characteristics of administrators should be related

to the context of the organization" because those members who are in power and who have the greatest influence over selection are those who have characteristics most "useful in coping with the organization's context and contingencies." Finally, our underlying assumption is that many firms purposefully seek out female directors for the benefits they bring to boards. Practitioner examples abound regarding the purposeful actions taken by boards to recruit and retain female and other minority directors (e.g., Blackman, 2004; Crockett, 2006). For example, General Motors spokesperson Toni Simonetti recently commented that the GM board considers demographic diversity in every board search (Lublin & Hawkins, 2006). Also, El Paso Corporation purposefully sought to add women to its all-male board in 2003 (Dvorak, 2006), and when creating the board for Pepsi Bottling in its spin-off from PepsiCo, CEO Craig Weatherup explicitly sought out women directors (Hillman, 2004).

**Advice and counsel.** Studies have shown that, compared to homogeneous groups, diverse groups exhibit increased information search and a greater range of perspectives. Further, they generate more alternative solutions to problems (Dutton & Duncan, 1987; Watson, Kumar, & Michaelsen, 1993) and evidence different environmental perceptions (Larkey, 1996; Sutcliffe, 1994). However, diversity may also lead to decreased communication, less effective decision making, increased conflict, and parochialism (Miller, Burke, & Glick, 1998). Specifically with regard to gender, research suggests that organizational actors make decisions that are consistent with their cognitive bases (Hambrick & Mason, 1984) and that people of different genders possess different norms, attitudes, beliefs, and perspectives based on these differences (Pelled, Eisenhardt, & Xin, 1999). Gender diversity has been found to facilitate creativity within groups (Hoffman & Maier, 1961; Nemeth, 1986), but also to lead to clashes within groups because others find it difficult to identify with those of a different gender (Pelled et al., 1999). Thus, gender diversity has both positive and negative implications for decision making and processes relevant to the board of director advice and counsel function. However, because boards are engaged in nonroutine problem solving and meet infrequently, the improved brainstorming, creativity, consideration of diverse perspectives, and questioning of the status quo in which they engage may represent "functional conflict" (Amason, 1996) and benefits that outweigh other, possibly negative implications for communication. Luke Visconti, cofounder of DiversityInc Media, was recently quoted as saying, "By having a diverse board, you're going to make fewer bad de-

cisions" and that (by recruiting demographically diverse directors), "you're going to get not only a capable board member, but someone who can navigate between cultures" (Blackman, 2004: B9).

**Legitimacy.** The legitimacy of organizational practices is conferred by societal members (Ashforth & Gibbs, 1990; Meyer & Rowan, 1977). Cox, Lobel, and McLeod (1991) described the "value-in-diversity" hypothesis, according to which society's values regarding organizational diversity put significant pressure on firms to include females on their boards of directors (Elgart, 1983). The pressure for gender diversity comes from a number of different stakeholders that firms depend upon, and few organized interests argue against such board appointments. For example, institutional investors increasingly scrutinize corporate boardrooms for diversity (Browder, 1995; Singh, 2005), and the reputation and credibility of a firm in both internal and external labor markets may improve by its including women on the board (Daily & Schwenk, 1996; Hambrick & D'Aveni, 1992). Thus, all other things being equal, gender diversity within boards of directors adds legitimacy to an organization (Milliken & Martins, 1996).

**Communication, commitment, and resources.** By virtue of their different experience sets, beliefs, and perspectives, women have the potential to link organizations to different constituencies than men. Women are the primary purchasers in the United States, making 88 percent of all purchases and controlling spending in almost half of all households with assets of more than \$500,000 (Kanner, 2004). The importance of female purchasing power is recognized in boardrooms. Larry Johnston, CEO of the Albertsons grocery chain, recently stated, "Women have insight into our customers that no man—no matter how bright, no matter how hardworking—can match. That's important when 85% of all consumer buying decisions made in our stores are made by women" (Natividad, 2005: 13). Similarly, in reference to the purchasing power of female customers, Daily, Certo, and Dalton quoted Avon's CEO as stating, "Having women on the board just makes good sense" (1999: 94).

In addition to linking an organization to customers, Mattis (1993) argued that female directors serve as role models to individuals inside the organization, as mentors for aspiring women employees, and as a signal to other women in the organization and in the labor force that their concerns and issues will be heard. Similarly, women directors signal that an organization offers opportunities for career growth to both current and prospective employees (Milliken & Martins, 1996). One of the key success factors of diversity management is commitment

from the senior executives of an organization (Rynes & Rosen, 1995). Cox and Nkomo's (1991) study showed that the main reason managerial women left organizations was a lack of career growth and opportunities, and subsequent studies have shown that this turnover has a significant financial cost for organizations (Robinson & Dechant, 1997). Therefore, board diversity may signal an organizational commitment to diversity both internally and externally and provide access to a broader pool of potential employees.

Finally, female directors may also link a firm to important suppliers. As mentioned above, many institutional investors have policies of investing only in firms with a commitment to gender representation (Coffey & Fryxell, 1991), but links to other suppliers are also important to consider. The number of female- and minority-owned businesses in the United States in 1997 totaled over 20 million, with sales of over \$18.5 trillion (U.S. Census Bureau, 2001). Female directors can provide important ties to these organizations, again serving as symbols of commitment to minorities and females. In sum, female representation on boards of directors may link firms to different customers, current and potential employees, and important suppliers, including investors. We now turn to the conditions under which these benefits may be of the greatest value.

### When Board of Directors Linkage Benefits from Female Representation Are the Most Valuable

**Organizational size.** Research on organizational legitimacy implies that larger and more visible organizations experience more pressure to conform to societal expectations (DiMaggio & Powell, 1985; Meyer & Rowan, 1977). Large firms are the most visible to the public (Salancik, 1979; Suchman, 1995) and are likely to be under the most scrutiny.<sup>1</sup> As suggested earlier, societal expectations for gender diversity among a variety of stakeholders (e.g., investors, customers, communities) place pressure on such organizations to increase female representation in their upper echelons, and governance watchdog groups suggest that demands from institutional investors coupled with increasing regulatory pressure for more independent boards of di-

<sup>1</sup> Although legitimacy is similarly important to new and small firms as well, gender diversity on boards has not reached such a high level of acceptance that it constitutes a necessary condition for survival for new companies. Therefore, we focus primarily on the effects of visibility created by size.



rectors have intensified scrutiny among the largest U.S. corporations (Munk, 2003). Thus,

*Hypothesis 1. Organizational size is positively associated with female representation on a board of directors.*

**Industry nature.** The nature of an industry is also likely to affect the value of benefits from female representation on boards of directors. In particular, industries vary in their degree of dependence on females in the labor pool. As discussed above, having females on a firm's board can provide a valuable form of legitimacy in the eyes of potential and current employees. Thus, being in an industry with a large female employment base should tend to increase the benefits of female representation on a firm's board of directors.

*Hypothesis 2. Firms in industries with greater female employment bases are positively associated with female representation on boards of directors.*

**Diversification strategy.** The nature of environmental dependencies and the importance of specific board of directors linkage benefits also depend on firm-level strategy (Hillman et al., 2000). That is, a firm's choice of strategy determines the benefits from specific links. Although the type of industry a firm chooses to operate in represents one strategic choice relevant to the benefits provided by female representation on its board, the firm's corporate strategy or level of diversification also may influence the value of these benefits. Firms operating in a single business environment face confined environmental dependencies compared with those operating in multiple product-market environments. Spanning multiple product-markets likely increases the value of a broader set of perspectives and ties to external constituents provided by gender diversity at the board level. That is, as a firm's scope of environmental dependencies increases as a result of diversification, the value of ties to different stakeholders in the environment and the increased breadth of perspectives represented by females on the board are likely to grow in importance. Therefore,

*Hypothesis 3. A firm's level of diversification is positively associated with female representation on its board of directors.*

**Network effects.** Other firms are an important source of uncertainty in the external environment of a firm and, as a result, firms form links with each other to reduce this uncertainty and obtain information, communication, and resources. Firms form links with others formally through their directors'

home company affiliations and other directorates (Burt, 1980; Pfeffer, 1972). These links provide information regarding innovation and strategy (Bazerman & Schoorman, 1983; Haunschild & Beckman, 1998). Interlocking directorates can also convey the value of particular practices, such as gender diversity on a board of directors, and provide additional information and links to a supply of female directors. Thus, we would expect female representation on boards of directors to be similarly disseminated throughout an interorganizational network. Diffusion of organizational practices such as gender diversity occurs via the individuals who link organizations through their networks (Aldrich & Zimmer, 1986). According to the theory of embeddedness (Granovetter, 1985), firms more centrally located in an interorganizational network have more and stronger links to other firms and directors. Likewise, better-networked firms have improved access to scarce information and scarce resources, such as qualified director candidates (Hultin & Szulkin, 1999; Simon & Warner, 1992). Thus,

*Hypothesis 4. A firm's number of links to other firms with females on their boards of directors is positively associated with female representation on its board of directors.*

## METHODS

### Sample

Sample selection began with identification of the 1,000 publicly traded U.S. firms that had the largest sales between 1990 and 2003. We used public filings, such as annual reports, 10Ks, and proxy statements to gather information on each company's top management team (TMT) members and directors as well as financial data for each year. Any company that had not been publicly traded for at least five contiguous years between 1990 and 2003 was deleted from the sample. The final sample consisted of 950 firms and 9,722 firm-year observations.

### Measures

**Female board representation.** The dependent variable of interest in this study was coded 1 if a firm's board of directors included at least one woman and 0 otherwise, because resource dependence theory suggests the likelihood of a particular type of director being appointed to a particular board, and our central research question concerned differentiating firms with female representation from those without it. To identify director gender, we went through four steps: First, we used a na-

tional survey of women on boards of directors from Kinder, Lydenberg, Domini (KLD) and checked to see that the women listed there were identified as female in our database. Second, we consulted press reports about female executives and board members (e.g., the *Wall Street Journal's* annual supplement for 2005, "Top Women to Watch") to confirm that individuals mentioned in these media reports were correctly coded. Third, we identified gender-specific names (e.g., David = male; Susan = female). Finally, we "Googled" any remaining gender-ambiguous names.

**Organizational size.** We measured organizational size as the logarithm of sales. Many studies have used sales as a measure of firm size (e.g., Hambrick & Cannella, 2004; Sanders & Boivie, 2004); assets (e.g., Peng, 2004) and number of employees (e.g., Konrad & Mangel, 2000) are other common metrics. Using those two other measures for firm size yielded results identical to those reported below.

**Industry labor force.** We used Bureau of Labor Statistics (BLS) data to identify the percentage of employees who were women in each two-digit SIC industry category. Our measure, *industry female employment*, reflects annual BLS statistics from the 1994–2004 editions of *Employment and Earnings*, such as women comprising the majority in health services and financial occupations but remaining vastly underrepresented in such industries as construction and utilities.

**Diversification strategy.** We used Palepu's (1985) entropy measure to gauge diversification. The entropy measure for *related diversification* captures the extent to which a company's sales are represented by similar industry segments and related industry groups. The measure for *unrelated diversification* involves gauging the extent to which the firm's sales are derived from different two-digit SIC industries.

**Network effects.** We tested the network effects hypotheses by measuring outside female director links as the total number of women directors to whom a focal firm was linked through its outside directors. The variable was a count of female directors on the boards of the other firms where the focal firm's directors served on either the TMT or board.

**Control variables.** We included board size (*number of directors*) to scale the female representation on the sampled boards. *Organizational age* was used to counter potential alternative explanations (e.g., inertia) for female representation. Because our data spanned 1990 through 2003, we also had dummy variables to control for year fixed effects.

We also included a variety of market- and accounting-based performance metrics as control

variables, in view of the possible explanation that performance precedes diversity (Hillman et al., 2000). Our performance measures were the following: *total risk*, calculated as the standard deviation in daily stock returns over a company's fiscal year (standardized to a mean of 0 and a standard deviation of 1); *Tobin's Q*, calculated with Bertrand and Schoar's (2003) formula, which compares the market value of assets to their replacement cost or book value; *shareholder return*, measured as the end-of-fiscal-year return to \$1.00 invested in a firm's stock on the first day of a fiscal year (expressed as a percentage); *value-weighted market return*, a control for market effects, calculated as the end-of-fiscal-year return to \$1.00 invested in a fully diversified portfolio on the first day of a fiscal year (expressed as a percentage); *return on assets*, the ratio of net income to total assets, expressed as a percentage; and the *debt-to-equity ratio*, or long-term debt plus current liabilities divided by common equity.

## Analyses

Our study included company-year data from 1990 through 2003. Recognizing the observations were not independent and exhibited some cross-sectional heterogeneity, we treated the data set as a panel with all observations consolidated over our 14-year window. We ran population-averaged logistic regression models with firm as the cross-sectional unit and year as the temporal unit (Greene, 2003: 285, 291, 293, 304; STATA, 2003). We chose not to use a firm-level fixed-effects approach because female representation on the boards of nearly half our sample firms did not vary over time; 502 firms consistently had either no women or at least one woman for the entire period. Using a fixed-effects approach was also inappropriate because our data failed the Hausman test, indicating that independent variables were correlated with firm fixed effects.

Therefore, for our sample of 950 firms we utilized a population-averaged model in which generalized estimating equations (GEE) adjusted for the correlation between independent variables and fixed effects, thus rendering our random effects appropriate for the adjusted sample. Population averaging represents a generalization of general linear models that takes into account within-group correlations, thus correcting for violations of the assumption that unobserved firm-specific random effects and fixed effects are uncorrelated (STATA, 2003). Jensen and Zajac (2004) utilized and explained a similar logic in moving from a fixed-effects modeling strategy. The population-averag-

ing method is in this respect a conceptual middle ground between fixed and random effects.

The evidence from our analyses permitted us to comment on the practical implications of a change in our independent variables on the likelihood of having women on a board. To check the robustness of our results, we conducted several alternative analyses. First, we ran multinomial logistic models, separating boards with one woman from those with two or more women. The results of those models did not differ importantly from those reported here. That is, the coefficients for one woman and those for two or more women were always of the same sign and significance levels. Negative binomial regressions with the count of women directors as the dependent variable also led to the same conclusions for our hypothesis tests. We therefore report only the results from the panel data logistic regressions using population averaging to control for cross-sectional heterogeneity.

## RESULTS

Table 1 provides means, standard deviations, and correlations for our measures. As can be seen from this table, 44.21 percent of our sample firms had no female directors, and the remaining 55.79 percent had one or more. We tested for multicollinearity in two ways. First, we ran OLS regressions to generate variance inflation factors and found that none exceeded 3, a value well below the accepted maximum of 10 (Chatterjee & Price, 1991). Second, in running the logistic models reported here, we systematically deleted one independent variable at a time, checking to see if the deletion changed the sign or significance level of any key independent

variables. The signs and significance levels of our independent variables were not affected. Therefore, we concluded that multicollinearity had little impact on our analyses.

Table 2 provides the results of our analyses. To ease interpretation of the results, we report odds ratios rather than coefficients. Odds ratios represent the change in the likelihood of a dependent variable arising from a one-unit change in the independent variable. An odds ratio of 1.00 indicates no effect. Odds ratios of greater than 1.00 indicate that increases in the independent variable increase the likelihood of the dependent variable (in this case, increase in the likelihood of having one or more women on the board). Odds ratios of less than 1.00 indicate negative associations—here, that increases in the independent variable are associated with decreases in the likelihood of having women on the board.

Hypothesis 1 predicts that organizational size will be positively associated with female board representation. Larger organizations are expected to face greater liabilities with regard to legitimacy and to respond to societal pressures for greater gender diversity in their corporate boardrooms. The evidence in Table 2 (model 2) supports this hypothesis. The odds ratio for the log of sales indicates that moving from the sample mean to one unit above the mean in firm size increases the likelihood of female representation on a board of directors by about 19.2 percent (odds ratio = 1.19,  $p < .001$ ).<sup>2</sup>

<sup>2</sup> It is important to remember that the magnitude of effects reported is nonlinear because the variables were log-transformed for the logistic regression analysis. The

**TABLE 1**  
**Descriptive Statistics and Correlations<sup>a</sup>**

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Women directors	0.56	0.50															
2. Organizational age	33.35	34.87	.25														
3. Total risk	0.00	1.00	-.15	-.25													
4. Debt-to-equity ratio	2.30	17.43	.00	-.01	.04												
5. ROA	3.98	8.47	.04	.05	-.24	-.03											
6. Tobin's <i>Q</i>	1.82	1.46	.05	.00	.09	-.02	.32										
7. Shareholder return	18.46	51.20	-.04	-.08	.00	-.02	.15	.32									
8. Value-weighted market return	13.08	16.81	-.04	-.01	-.23	-.01	.09	.06	.24								
9. Number of directors	11.00	4.31	.28	.13	-.23	-.02	-.02	-.07	-.04	.05							
10. Annual sales <sup>b</sup>	8.01	1.24	.30	.27	-.12	.01	.00	-.01	-.09	-.07	.33						
11. Industry female employment	39.23	14.30	.05	-.16	.04	.00	-.01	.02	.03	.00	.06	.01					
12. Related diversification	0.13	0.26	.08	.15	-.09	.00	-.05	-.07	-.06	-.03	.07	.11	-.05				
13. Unrelated diversification	0.23	0.37	.05	.20	-.12	-.01	-.03	-.08	-.06	-.01	.09	.19	-.14	.08			
14. Outside female director links	6.48	8.07	.46	.34	-.20	.00	.05	.05	-.03	.05	.31	.44	.05	.08	.14		

<sup>a</sup> Correlations of greater than |.02| are significant at  $p < .05$ .

<sup>b</sup> Logarithm.

**TABLE 2**  
**Results of Logistic Regression Analysis for the**  
**Presence of Women Directors<sup>a</sup>**

Variables	Model 1: Controls	Model 2: Main effects
Organizational age	1.01***	1.01***
Total risk	0.90***	0.93*
Debt-to-equity ratio	1.00	1.00
ROA	1.00	1.00
Tobin's <i>Q</i>	1.02	1.02
Shareholder return	1.00	1.00
Value-weighted market return	1.00	1.00
Number of directors	1.16***	1.12***
Annual sales <sup>b</sup>		1.19***
Industry female employment		1.01*
Related diversification		1.19
Unrelated diversification		0.84*
Outside female director links		1.09***
Wald $\chi^2$	1,072.26***	1,245.42***
<i>n</i>	9,722	9,722

<sup>a</sup> Odds ratios are reported. Year dummy variables were included in the analysis but results are omitted here.

<sup>b</sup> Logarithm.

\*  $p < .05$

\*\*\*  $p < .001$

Hypothesis 2 predicts that industries with larger female employment bases will have greater female representation on their firms' boards of directors. The evidence in Table 2 (model 2) supports this hypothesis. Firms operating in industries with greater numbers of female employees are more likely to have female representation on their boards (odds ratio = 1.01,  $p < .05$ ). A 1 percent increase in the industry's employment of women (above the mean of 39 percent) leads to about a 1 percent increase in the likelihood that a board will have at least one woman.

Hypothesis 3 predicts that level of diversification will be positively associated with female representation on a board. The evidence in model 2 provides no support for this hypothesis. The odds ratio for related diversification is not significant, and the negative association between unrelated diversification and female representation (odds ratio = 0.84,  $p < .05$ ) is opposite the predicted positive association. Therefore, Hypothesis 3 is rejected.

Hypothesis 4 predicts that the extent to which a firm is linked to other firms with female directors will be positively associated with female representation on its board. The evidence in model 2

strongly supports this network effects hypothesis. Female board of directors representation is significantly and positively related to the count of outside women director links (odds ratio = 1.09,  $p < .001$ ). This evidence suggests that an increase of one female director among linked firms (above the mean value of 6.48) increases the likelihood of having at least one woman on a board by about 9 percent. Alternatively, of course, a decrease of one female director among linked firms (below the mean value of 6.48) decreases the likelihood of having a female director by the same percentage.

Only three of the control variables were found to be significantly associated with female board representation. These were firm age (odds ratio = 1.01,  $p < .001$ ), total risk (odds ratio = 0.93,  $p < .05$ ), and number of directors (board size; odds ratio = 1.12,  $p < .001$ ).

## DISCUSSION

Our inquiry began with the observation that female representation among large corporations' boards of directors is far from pervasive or uniform, begging the question of why some organizations have such representation while others do not. Little if any research on board of directors diversity examines gender, and the literature that does concern gender diversity almost exclusively focuses on the work group level as opposed to the board level. The few studies focused on women on boards of directors either take female representation as exogenous or examine individual methods of influence or advancement rather than organization-level predictors. In this sense, our effort is an important but exploratory one. Taking an initial step into this research gap, we adopted a resource dependence perspective commonly used to examine board composition and tested hypotheses in the context of the 1,000 U.S. firms with the largest sales over 14 years.

Resource dependence theory suggests three broad categories of benefits accrue to firms through boards: advice and counsel, legitimacy, and access to resources/channels of communication. Our overall findings support the resource dependence logic and these presumed benefits. Theory suggests large firms are under increased pressure for legitimacy and, in our sample, large firms have a significantly greater likelihood of women on their boards. Theory also suggests firms operating in industries dependent on female employees can benefit from ties to current/potential employees, and our results provide evidence that female representation on boards of directors is higher in these industries. Our data also bear out resource dependence theory's focus on the benefits provided through inter-

effect sizes we report are valid only for one-unit changes above or below the sample mean. See Petersen (1985) for details.



locking directorates. We find that when a firm is linked to other firms with female directors, it is more likely to have female representation on its own board of directors. Although our data do not allow us to directly observe the dissemination of best practices or whether links provide access to a supply of potential female directors, our evidence is consistent with resource dependence logic.

Even given this consistency with theory, it is also important to recognize that our evidence is not conclusive. Institutional theory, which overlaps with resource dependence theory in also examining legitimacy, would also fit our evidence. Similarly, social network theory and, potentially, the isomorphic norms from institutional theory would be consistent with our evidence regarding network effects. However, from a holistic perspective, we consider resource dependence theory logic to have aided us well in this initial inquiry and encourage further research using other theoretical foundations.

Our findings suggest research may benefit from expanding resource dependence theory's early focus on boards of directors as a linkage mechanism to also include board gender diversity. As suggested above, we hope our findings will spur additional examinations of other characteristics that may influence female representation on boards. A key limitation of our approach and study is that resource dependence theory is primarily focused on environmental dependencies and, by adopting it, we did not examine more internal organizational predictors such as leadership, hiring and promotional environments, culture, and so forth, that may also be important organizational factors. Internal predictors such as these might help explain why our control variables for board size exhibit the relationships they do. We acknowledge that although ours is an important first step, an exploration of internal factors should follow for a more complete understanding.

Additional research in other contexts may also be a fruitful next step. For example, although women are fairly underrepresented in the United States in corporate boardrooms in relation to their numbers in the managerial labor force, other countries lag far behind the United States in terms of the number of women on boards. Exploring the criticality of the board linkage needs fulfilled by female representation on boards of directors across countries would be an interesting avenue for further work.

The empirical results of our initial exploration also raise some interesting questions and suggest the need for further research. First, although we drew upon resource dependence logic and work-group-level diversity research for our propositions and found associations among many of our hypoth-

esized variables, we could not draw conclusions regarding causality. Further, we relied on Pfeffer and Salancik's (1978) arguments for the benefits of advice and counsel, legitimacy, and channels of communication, support, and resources, yet we did not directly measure these benefits, nor did we assess whether board members understand and act on these benefits. Plausible theory suggests they might do so, but our work cannot assess board member motives or cognitions. Future research studies on the actual mechanisms and benefits brought by women on boards of directors and board cognition would be other fruitful extensions of our work.

The implications of our work for practice are also important. First, we believe the strategic composition of boards and dynamic consideration of the organizational context and needs for board linkages are important for management practice. At its broadest level, our research suggests that firms can benefit from such links and that purposeful selection of board members who can help manage environmental dependencies is valuable to a firm. In terms of female representation on boards of directors more specifically, our results point to certain industries (those with high female employment) and firms (those that are larger and more central in a network) with increased female representation in boardrooms. Predictors of female board representation may help scholars understand when and why a given context is conducive to the appointment of a female director, in such a way that the differentiators of why women are on some boards and not others can inform issues of representation. These findings represent areas of opportunity, both for women seeking to advance into the corporate elite and for firms seeking to improve their gender diversity.

## REFERENCES

- Aldrich, H. E., & Zimmer, C. 1986. Entrepreneurship through social networks. In D. L. Sexton & R. W. Smilor (Eds.), *The art and science of entrepreneurship*: 3–23. Cambridge, MA: Ballinger.
- Amason, A. C. 1996. Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams. *Academy of Management Journal*, 39: 123–148.
- Ashforth, B. E., & Gibbs, B. 1990. The double-edge of organizational legitimation. *Organization Science*, 1: 117–194.
- Baysinger, B. D., & Butler, H. N. 1985. Corporate governance and the board of directors: Performance effects

- of changes in board composition. *Journal of Law, Economics and Organization*, 1: 101–124.
- Bazerman, M. H., & Schoorman, F. D. 1983. A limited rationality model of interlocking directorates. *Academy of Management Review*, 8: 206–217.
- Bertrand, M., & Schoar, A. 2003. Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics*, 118: 1169–1208.
- Bilimoria, D., & Piderit, S. K. 1994. Board committee membership: Effects of sex-based bias. *Academy of Management Journal*, 37: 1453–1477.
- Blackman, A. 2004. Casting a wider net: Diversity in the boardroom is gaining as a way to improve governance and business decisions. *Wall Street Journal*, June 21: B6–B7.
- Boeker, W., & Goodstein, J. 1991. Organizational performance and adaptation: Effects of environment and performance on changes in board composition. *Academy of Management Journal*, 34: 805–826.
- Boyd, B. K. 1990. Corporate linkages and organizational environment: A test of the resource dependence model. *Strategic Management Journal*, 11: 419–430.
- Browder, D. 1995. Shareholders are valuing diversity. *Directors and Boards*, 19(3): 12–17.
- Burt, R. S. 1980. Cooptive corporate actor networks: A reconsideration of interlocking directorates involving American manufacturing. *Administrative Science Quarterly*, 25: 557–582.
- Carpenter, M. A., & Westphal, J. D. 2001. The strategic context of external network ties: Examining the impact of director appointments on board involvement in strategic decision making. *Academy of Management Journal*, 44: 639–660.
- Carter, D., Simkins, B., & Simpson, W. 2003. Corporate governance, board diversity, and firm value. *Financial Review*, 38(1): 33–53.
- Catalyst. 2005. *Catalyst census of women corporate officers and top earners and Catalyst census of women board directors*: <http://www.catalyst.org>.
- Certo, S. T. 2003. Influencing initial public offering investors with prestige: Signaling with board structures. *Academy of Management Review*, 28: 432–446.
- Chatterjee, S., & Price, B. 1991. *Regression analysis by example* (2nd ed.). New York: Wiley.
- Coffey, B., & Fryxell, G. E. 1991. Institutional ownership of stock and dimensions of corporate social performance: An empirical examination. *Journal of Business Ethics*, 10: 437–444.
- Cox, T., Lobel, S., & McLeod, P. 1991. Effects of ethnic group cultural differences on cooperative and competitive behavior on a group task. *Academy of Management Journal*, 34: 827–847.
- Cox, T., & Nkomo, S. 1991. A race and gender group analysis of the early career experience of MBAs. *Work Occupations*, 18: 431–446.
- Crockett, R. 2006. The rising stock of black directors. *BusinessWeek*, February 27: 34.
- Daily, C. M., Certo, S. T., & Dalton, D. R. 1999. A decade of corporate women: Some progress in the boardroom, none in the executive suite. *Strategic Management Journal*, 20: 93–99.
- Daily, C. M., Dalton, D. R., & Cannella, A. A., Jr. 2003. Corporate governance: Decades of dialogue and data. *Academy of Management Review*, 28: 371–382.
- Daily, C. M., & Schwenk, C. 1996. Chief executive officers, top management teams, and boards of directors: Congruent or countervailing forces? *Journal of Management*, 22(2): 185–208.
- Dalton, D. R., Daily, C. M., Johnson, J. L., & Ellstrand, A. E. 1999. Number of directors and financial performance: A meta-analysis. *Academy of Management Journal*, 42: 674–686.
- Davis, G. F., & Mizruchi, M. S. 1999. The money center cannot hold: Commercial banks in the US system of corporate governance. *Administrative Science Quarterly*, 44: 215–239.
- DiMaggio, P. J., & Powell, W. W. 1985. The structure of corporate ownership: Causes and consequences. *Journal of Political Economy*, 93: 1155–1177.
- Dutton, J. E., & Duncan, R. B. 1987. The creation of momentum for change through the process of strategic issue diagnosis. *Strategic Management Journal*, 8: 279–295.
- Dvorak, P. 2006. Women slowly break into boardroom: They are gaining seats as directors, but progress remains inconsistent. *Wall Street Journal*, March 27: B3.
- Elgart, L. 1983. Women on Fortune 500 boards. *California Management Review*, 24(4): 121–127.
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. 2003. Board of director diversity and firm financial performance. *Corporate Governance: An International Review*, 11(2): 102–111.
- Gasparino, C., & Boyce, J. 1998. SEC to hold meetings in effort to boost women and minorities in corporate US. *Wall Street Journal*, January 19: A3.
- Granovetter, M. 1985. Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91: 481–510.
- Greene, W. H. 2003. *Econometric analysis* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.
- Hambrick, D. C., & Cannella, A. A. 2004. CEOs who have COOs: Contingency analysis of an unexplored structural form. *Strategic Management Journal*, 25: 959.
- Hambrick, D. C., & D'Aveni, R. A. 1992. Top team deterioration as part of the downward spiral of large corporate bankruptcies. *Management Science*, 38: 1445–1466.

- Hambrick, D. C. & Mason, P. 1984. Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9: 193–206.
- Haunschild, P. R. 1993. Interorganizational imitation: The impact of interlocks on corporate acquisition activity. *Administrative Science Quarterly*, 38: 564–592.
- Haunschild, P. R., & Beckman, C. 1998. When do interlocks matter? Alternate sources of information and interlock influence. *Administrative Science Quarterly*, 43: 815–844.
- Hillman, A. J. 2004. *Governance from scratch: The Pepsi Bottling Group IPO* (Ivey publishing case 9B04M062). London, ON: Ivey.
- Hillman, A. J., Cannella, A. A., & Harris, I. C. 2002. Women and minorities in the boardroom: How do directors differ? *Journal of Management*, 28: 747–763.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. 2000. The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37: 235–255.
- Hillman, A. J., & Dalziel, T. 2003. Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28: 383–396.
- Hoffman, L. R., & Maier, N. 1961. Quality and acceptance of problem solutions by members of homogeneous and heterogeneous groups. *Journal of Abnormal and Social Psychology*, 2: 401–407.
- Hultin, M., & Szulkin, R. 1999. Wages and unequal access to organizational power: An empirical test of gender discrimination. *Administrative Science Quarterly*, 44: 453.
- Ibarra, H. 1992. Homophily and differential returns: Sex differences in network structure and access in an advertising firm. *Administrative Science Quarterly*, 37: 422–447.
- Ibarra, H. 1993. Personal networks of women and minorities in management: A conceptual framework. *Academy of Management Review*, 18: 56–87.
- Jensen, M., & Zajac, E. J. 2004. Corporate elites and corporate strategy: How demographic preferences and structural position shape the scope of the firm. *Strategic Management Journal*, 25: 507–524.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. 1996. Boards of directors: A review and research agenda. *Journal of Management*, 22(3): 409–438.
- Kanner, B. 2004. *Pocketbook power*. New York: McGraw-Hill.
- Kesner, I. F. 1988. Directors' characteristics and committee membership: An investigation of type, occupation, tenure, and gender. *Academy of Management Journal*, 31: 66–84.
- Konrad, A. M., & Mangel, R. 2000. The impact of work-life programs on firm productivity. *Strategic Management Journal*, 21: 1225.
- Larkey, L. 1996. Toward a theory of communicative interactions in culturally diverse workgroups. *Academy of Management Review*, 21: 463–491.
- Lublin, J. S., & Hawkins, L. 2006. GM's board seeks to add an African-American director, *Wall Street Journal*: B1.
- Mattis, M. 1993. Women directors: Progress and opportunities for the future. *Business in the Contemporary World*, 5: 140–156.
- Meyer, J., & Rowan, B. 1977. Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83: 340–363.
- Miller, C. C., Burke, L. M., & Glick, W. H. 1998. Cognitive diversity among upper-echelon executives: Implications for strategic decision processes. *Strategic Management Journal*, 19: 39–58.
- Milliken, F. J., & Martins, L. L. 1996. Searching for common threads: Understanding the multiple effects of diversity in organizational groups. *Academy of Management Review*, 21: 402–433.
- Mizruchi, M. S. 1983. Who controls whom? An examination of the relation between management and board of directors in large American corporations. *Academy of Management Review*, 8: 426–435.
- Munk, C. W. 2003. Women still minority on boards of most Fortune 500 companies, *Wall Street Journal*, December 10: 1.
- Natividad, I. 2005. Women directors and the global company, *Directors Monthly*, March: 13–15.
- Nemeth, C. J. 1986. Differential contributions of majority and minority influence. *Psychological Review*, 91: 23–32.
- Palepu, K. 1985. Diversification strategy, profit performance, and the entropy measure. *Strategic Management Journal*, 6: 239–255.
- Pelled, L. H., Eisenhardt, K. M., & Xin, K. R. 1999. Exploring the black box: An analysis of work group diversity, conflict, and performance. *Administrative Science Quarterly*, 44: 1–28.
- Peng, M. W. 2004. Outside directors and firm performance during institutional transitions. *Strategic Management Journal*, 25: 453.
- Petersen, T. 1985. A comment on presenting results from logit and probit models. *American Sociological Review*, 50: 130–131.
- Pfeffer, J. 1972. Size and composition of corporate boards of directors: The organization and its environment. *Administrative Science Quarterly*, 17: 218–229.
- Pfeffer, J., & Salancik, G. R. 1978. *The external control of organizations: A resource dependence perspective*. New York: Harper & Row.

- Robinson, G., & Dechant, K. 1997. Building a business case for diversity. *Academy of Management Executive*, 11(3): 21.
- Rynes, S., & Rosen, B. 1995. A field survey of factors affecting the adoption and perceived success of diversity training. *Personnel Psychology*, 48: 247.
- Salancik, G. R. 1979. Interorganizational dependence and responsiveness to affirmative action: The case of women and defense contractors. *Academy of Management Journal*, 22: 375.
- Sanders, W. G., & Boivie, S. 2004. Sorting things out: Valuation of new firms in uncertain markets. *Strategic Management Journal*, 25: 167.
- Scott, W. R. 1995. *Institutions and organizations*. Thousand Oaks, CA: Sage.
- Selznick, P. 1949. *TVA and the grass roots*. Berkeley: University of California Press.
- Simon, C. J., & Warner, J. T. 1992. Matchmaker, matchmaker: The effect of old boy networks on job match quality, earnings, and tenure. *Journal of Labor Economics*, 10: 306.
- Singh, V. 2005. Shuffling the deck for boardroom diversity. *Financial Times*, June 10: 4.
- STATA. 2003. *Cross-sectional time series*. College Station, TX: Stata Press.
- Stearns, L. B., & Mizruchi, M. S. 1993. Board composition and corporate financing: The impact of financial institution representation on borrowing. *Academy of Management Journal*, 36: 603–618.
- Suchman, M. C. 1995. Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20: 571–610.
- Sutcliffe, K. M. 1994. What executives notice: Accurate perceptions in top management teams. *Academy of Management Journal*, 37: 1360–1378.
- U.S. Census Bureau. 2001. *Minority- and women-owned businesses, United States, 1997 economic census*. <http://www.census.gov/epod/mwb97/us/us.html>.
- Watson, W. E., Kumar, K., & Michaelsen, L. K. 1993. Cultural diversity's impact on interaction process and performance: Comparing homogeneous and diverse task groups. *Academy of Management Journal*, 36: 590–602.
- Westphal, J. D. 1999. Collaboration in the boardroom: Behavioral and performance consequences of CEO-board social ties. *Academy of Management Journal*, 42: 7–24.
- Westphal, J. D., & Milton, L. P. 2000. How experience and network ties affect the influence of demographic minorities on corporate boards. *Administrative Science Quarterly*, 45: 366–398.
- Westphal, J. D., & Stern, I. 2006. The other pathway to the boardroom: How interpersonal influence behavior can substitute for elite credentials and demographic majority status in gaining access to board appointments. *Administrative Science Quarterly*, 51: 169–193.
- Zald, M. N. 1969. The power and functions of boards of directors. *American Journal of Sociology*, 5: 97–111.



**Amy J. Hillman** ([amy.hillman@asu.edu](mailto:amy.hillman@asu.edu)) is the Jerry and Mary Ann Chapman Professor of Management in the W. P. Carey School of Business, Arizona State University. She received her Ph.D. from Texas A&M University. Her research interests include resource dependence linkages and firm performance, boards of directors, and corporate political strategies.

**Christine Shropshire** ([christine.shropshire@asu.edu](mailto:christine.shropshire@asu.edu)) is a doctoral candidate in the W. P. Carey School of Business at Arizona State University. Her research interests include corporate governance, stakeholder management, and diversity in the upper echelons.

**Albert A. Cannella Jr.** ([acannell@tulane.edu](mailto:acannell@tulane.edu)) is the Koerner Chair in Strategy and Entrepreneurship at Tulane University. He received his Ph.D. from Columbia University. His research interests focus on executives, entrepreneurship, and competitive dynamics.





Copyright of *Academy of Management Journal* is the property of Academy of Management and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.