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ORIGINAL PAPER

Alliance Network Centrality, Board Composition, and Corporate Social Performance

Craig D. Macaulay[1] · Orlando C. Richard[2] · Mike W. Peng[2] · Maria Hasenhuttl[2]

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Abstract What critical characteristics do firms have that determine the scale and scope of corporate social responsibility activities they undertake? This paper examines two disparate predictors of corporate social performance. First, using the lens of the resource-based view, we examine the role of alliance network centrality on corporate social performance. We find that centrality enhances corporate social performance. Second, we investigate how board composition affects corporate social performance. Specifically, drawing on stakeholder theory, we find that the percentage of female directors predicts greater corporate social performance. In addition, we look at the influence of outside directors on this relationship. Our findings show that the presence of more outside directors positively moderates the relationship between female directors and corporate social performance.

✉ Craig D. Macaulay
craig.macaulay@csulb.edu

Orlando C. Richard
orlando.richard@utdallas.edu

Mike W. Peng
mikepeng@utdallas.edu

Maria Hasenhuttl
maria.hasenhuttl@utdallas.edu

1 College of Business Administration, California State University – Long Beach, 1250 Bellflower Blvd – MS 8502, Long Beach, CA 90840, USA

2 Jindal School of Management, The University of Texas at Dallas, 800 W Campbell Rd, SM43, Richardson, TX 75080, USA

Keywords Alliance networks · Board composition · Corporate social responsibility · Female Directors · Resource-based view · Stakeholder theory

Abbreviations

CSR	Corporate social responsibility
CSP	Corporate social performance
DV	Dependent variable
KLD	Kinder, Lydenberg, Domini Research and Analytics database
NAICS	North American Industry Classification System
RBV	Resource-based view

Introduction

In corporate social responsibility (CSR) research, corporate social performance measures the level of CSR engagement. Previous research has shown that corporate social performance may increase firm financial performance (Alshammari 2015; Frooman 1997; Mackey et al. 2007; McGuire et al. 1988; Orlitzky et al. 2003; Turban and Greening 1997; Wang and Hsu 2011; Wood and Jones 1995). Further, institutional pressures are another reason firms may choose to engage in increased levels of CSR activities, resulting in higher corporate social performance (Campbell 2007; Orlitzky 2013). Recent research has also demonstrated a link between firm environmental performance (a component of corporate social performance) and cost of capital (El Ghoul et al. 2011; Flammer 2013). Several questions remain. What key characteristics do firms have that determine the scale and scope of CSR activities they undertake? What leads to higher corporate social performance?

There is a growing literature discussing the predictors of corporate social performance (Egri and Ralston 2008; McWilliams et al. 2006; Petrenko et al. 2016). The focus of these studies is on investigating which firm decisions lead to in an increase in overall CSR ‘output’. Given that studies have shown that a firm’s financial performance, at least in part, is a result of corporate social performance (McGuire et al. 1988; Orlitzky et al. 2003; Peng et al. 2016; Tang et al. 2012), understanding antecedents to corporate social performance is critical.

This paper advances the growing body of work on corporate social performance by identifying and adding new antecedents. Specifically, we look at how relationships and interactions between firms and how board members shape corporate social performance. We therefore examine factors both within firms and between firms. First, we examine the role of alliance network centrality on corporate social performance. Earlier work has examined network effects and philanthropy with interesting results (Galaskiewicz and Burt 1991). Other work has focused on how firms learn voluntary codes of CSR through alliances (Arya and Salk 2006), but few papers have examined network effects on corporate social performance as a wider construct. Rowley (1997) can be viewed as a precursor to our paper, but it is a theoretical-only application of network theory to stakeholder management, as opposed to corporate social performance explicitly. Surprisingly, the question of how alliance network ties (defined as the strategic alliances and joint ventures undertaken by the firms) shape corporate social performance is still largely an underexplored area. Our study attempts to fill this void by examining the network-to-corporate social performance effect.

Second, we examine how the presence of female directors affects corporate social performance. Earlier studies have shown that female directors are more interested in philanthropy and less interested in firm financial performance (Ibrahim and Angelidis 1995). A more recent study (Adams and Funk 2012) showed that female directors have different values; specifically, female directors were found to care more about benevolence than male directors. Having a higher percentage of female directors also increases the likelihood that a company is listed on several ‘best’ lists—for example the Most Ethical Companies list (Landry et al. 2016). Using stakeholder theory, we extend this logic by arguing that the wider construct of corporate social performance is influenced by the presence of female directors. Because there are more female directors on boards each year, there is an increasing need to understand their effects on all aspects of business (Post and Byron 2015; Wooten 2008), including corporate social performance.

Finally, we examine the moderating effect of outside directors on female directors with respect to corporate social performance. Outside directors, for the purposes of this paper, are defined as directors who are neither employees of the firm nor any other direct stakeholders (such as suppliers and customers). Because outside directors may be more responsive to stakeholder issues (Peng 2004), they may have an amplifying effect on female directors’ propensity for higher levels of corporate social performance. Indeed, recent research shows that having women on boards results in more charitable giving (Terjesen et al. 2009) and less securities fraud (Cumming et al. 2015). The level of outside directorships represents a potential moderator of such relationships.

Overall, our study endeavors to make three contributions. First, it extends earlier theoretical work on the role of alliance networks on philanthropy by examining it empirically while also extending it to the wider construct of corporate social performance (beyond philanthropy). Second, this paper advances our understanding of whether the presence of female directors affects corporate social performance. Third, we examine whether outside directors affect the relationship between female directors and corporate social performance. Thus, we bring a previously underexamined perspective on board dynamics with respect to corporate social performance to the current literature. Some of the earlier work on how female directors influence CSP is mixed, leading some researchers to call for more nuanced analysis (Eagly 2016). We believe this study is a positive step in that direction of inquiry.

Theory Development

Alliance Network Effects on Corporate Social Performance

Alliance networks are networks made up of firm relationships such as joint ventures and strategic alliances. They are a useful construct to add to the study of corporate social performance. Network centrality is a measure of positional advantage in alliance networks (Freeman 1979). Centrality is derived from a formula that weighs not only the number of linkages (strategic alliances and joint ventures, in this case) between firms, but also the quality of those linkages (i.e., how central the firms are that are linked to the focal firm). Firms that have many linkages with firms that also have many linkages (described as high quality because of the number of linkages) are considered more central than (1) firms with fewer links, (2) firms with many links but of a lower quality, and (3) firms with fewer links that are similar quality. In other words, firms that are more central accordingly have more linkages, and those they are linked to are likely to have more linkages (relative to the network) as well. Some studies have found that highly central firms in alliance networks have very unique resources that other partners desire, resulting in the increased number of linkages (Burt 2009; Gay and Dousset 2005). It is therefore logical to suggest that firms on the periphery of an alliance network either have few unique resources that other partners desire, or that those resources are not sharable in a traditional alliance relationship. Previous work has shown why peripheral firms are less likely to ally (Yang et al. 2011).

According to the resource-based view (RBV), the competitive basis of firms resides in how firms leverage the resources available to them (Barney 1991; Penrose 1959; Wernerfelt 1984). Firms more central in the network are centrally located because, from an RBV perspective, these firms have very unique resources that allow them to be leveraged to access, acquire, and leverage even more resources (Lavie 2006; Lavie and Miller 2008). Centrality, in turn, allows for even further opportunities to compete on the basis of these abilities (Gulati 1999; Kim and Tsai 2012).

Previous studies have shown a strong positive relationship between corporate social performance and firm financial performance (Alshammari 2015; Kim et al. 2015; Mackey et al. 2007; McGuire et al. 1988; Orlitzky et al. 2003; Turban and Greening 1997). Therefore, corporate social performance can be seen as a source of competitive advantage. It is a desirable trait across network relationships and therefore encourages firms to form such relationships. As a result, highly central firms, with their many alliance relationships, are more likely to have interacted with firms that compete (at least partially) on the basis of corporate social performance as a driver of competitive advantage.

We can also view these relationships from an alliance learning perspective (Inkpen 2000; Inkpen and Tsang 2005; Ireland et al. 2002; Kale and Singh 2007; Yang et al. 2011). Alliance learning is the process of gaining knowledge from alliance partners through the alliance mechanism (Inkpen 1998). Firms that are more central may be better at learning, because they have more experience with learning through partnerships than their peers who are less central. Given that corporate social performance can lead to competitive advantage, from a learning perspective, the ability of a firm to effectively leverage corporate social performance for competitive advantage would be a desirable trait in an alliance partner (Su et al. 2016). Central firms are more likely to have strategically partnered with firms with high corporate social performance, giving central firms another source of competitive advantage. Our expectation then is that central firms may end up with higher corporate social performance via such learning. Therefore:

Hypothesis 1 A firm's alliance network centrality positively relates to the corporate social performance of that firm.

The Effect of Female Directors on Corporate Social Performance

A basic premise of stakeholder theory is that the purpose of a firm is to create as much value for stakeholders as possible, not merely shareholders (Freeman 1984). Essentially, stakeholder theory contains four central theses (Donaldson and Preston 1995). The first is that the theory is descriptive of a firm. Donaldson and Preston (1995) view it as a 'constellation or cooperative and competitive interests possessing intrinsic value'. This description can be used as a basis for empirical work in stakeholder theory. In this paper, we are interested in the relationship between the board of directors (specifically female representation on the board) and the interplay between demands from shareholders (also stakeholders) and the broader community as it pertains to CSR (and in turn, corporate social performance).

Second, stakeholder theory is instrumental (Donaldson and Preston 1995). It provides a way to empirically view the different components of the firm from a stakeholder perspective. The general idea is that firms that better manage varying stakeholder demands generally obtain a competitive advantage. In other words, better corporate social performance—if there is a demand for such in the public—results in competitive advantage for a firm that successfully manages this demand (Berman et al. 1999; Ruf et al. 2001).

Third, stakeholder theory is normative (Donaldson and Preston 1995). It is subdivided into two distinct ideas: (1) that stakeholders are persons or groups with legitimate interests with respect to the firm and (2) that stakeholder concerns have intrinsic value, meaning they merit consideration for their own sake, independent of the desires of other groups, like shareholders. This dimension has an explicit application to our work, in that it suggests that certain groups demand CSR. Specifically, female directors are one group that responds to this demand, because they may have relatively less focus on the financial bottom line and more interest in ameliorating stakeholders (Adams and Funk 2012; Cumming et al. 2015; Ibrahim and Angelidis 1995; Landry et al. 2016).

Finally, stakeholder theory is managerial (Donaldson and Preston 1995). It involves weighing and deciding between conflicting interests and groups. This of course underscores the classic tug-of-war between a Friedmanesque view of firm financial performance versus a more holistic approach such as with stakeholder theory (Peng et al. 2016). The emphasis here is that the (financial) 'bottom line' is not the only consideration that managers face. Some work has examined how an increased need for corporate social performance may have unintended negative consequences on firm financial performance (Cennamo et al. 2009). This further demonstrates the potential tug-of-war between corporate social performance and firm financial performance. However, although we focus exclusively on corporate social performance here, we propose these are not necessarily strict opposites—specifically, emphasis on one does not, necessarily, harm the other.

Female directors, both insiders and outsiders, may tend to be more sensitive to corporate social performance (Adams and Funk 2012; Landry et al. 2016; Rao and Tilt 2016). Thus, their board presence may have a positive effect on CSR in general. Female directors, compared to their male counterparts, may be more likely to advocate for outside stakeholder groups, because of their social and economic background. For example, Harrigan (1981) found that female directors are more likely to come from legal, educational, or non-profit backgrounds. It is then reasonable to expect that female directors may be more sensitive to outside stakeholder issues than male directors, ceteris paribus. Previous work suggests female directors are more likely to have expert backgrounds outside of business than male counterparts and come with different perspectives (Hillman et al. 2002). For example, gender socialization theory suggests that men and women are raised and taught different roles based on gender, and that translates to differences in values and concerns, forming masculine and feminine roles in childhood (Dawson 1997). This supports the idea that there are fundamental differences between the genders. Women, for example, are shown to react more ethically when a dilemma arises (Mason and Mudrack 1996). Women also exhibit stronger feelings about disclosures related to ethical issues (Roxas and Stoneback 2004).

Indeed, previous work has shown some relationship between board diversity and most admired firms (used by some as a proxy for CSR performance) (Adams and Funk 2012; Bear et al. 2010). Indeed, while recent work has shown women tend to be more empathic than men (Mestre et al. 2009), it is now being increasingly suggested that employee empathy plays a large role in CSR development in a firm (Muller et al. 2014). Female managers have been shown to participate more in board deliberations than their male counterparts (Eagly et al. 2003) and are more democratic (Eagly and Johnson 1990). Female managers have also been found to be more transformational than their male counterparts (Eagly et al. 2003). Indeed, the social role theory of leadership suggests that women are more likely to show a greater concern for the welfare of people than men (Eagly and Carli 2007; Eagly et al. 1995). Other recent studies on female directors have found that they care more about benevolence than men (Adams and Funk 2012).

Existing work does show that boards with more women are likely to have higher levels of charitable giving (Krüger 2009; Terjesen et al. 2009; Wang and Coffey 1992; Williams 2003), higher levels of environmental CSR (Post et al. 2011), and generally better employee work environments (Johnson and Greening 1999). Our argument is that these collective elements (informed by the stakeholder arguments)—coupled with female directors' more participatory demeanor, emphasis on ethics, and concern for others—may lead to higher overall corporate social performance in firms with more women on the board. Therefore:

Hypothesis 2 A firm's percentage of female directors on its board positively relates to the corporate social performance of that firm.

The Moderating Effect of Outside Directors on Female Directors

From a theoretical perspective, stakeholder theory also suggests that outside directors are important for the competitiveness of a firm. Outside directors are another mechanism firms use to address stakeholder issues, and the presence of such directors is described as board pluralism (Bazerman and Schoorman 1983). Other work has suggested that outside directors may be more responsive to stakeholder pressures (Kassinis and Vafeas 2002; Peng 2004; Roberts and Dowling 2002).

Outside directors may be more likely than inside directors to support philanthropy (Ibrahim and Angelidis 1995). This is a clear illustration of stakeholder theory as outlined by Donaldson and Preston (1995), where managers (in this case directors) weigh the needs and desires of different stakeholder groups to make decisions, sometimes prioritizing stakeholder concerns over firms' short-term economic concerns. Outside directors also have been shown to have an effect on voluntary CSR disclosures (Jizi et al. 2014).

While philanthropy is only one dimension of CSR, we believe these earlier findings may hold for the wider construct of corporate social performance for some of the very same reasons. In fact, we predict that the presence of outside directors, on their own, may not be enough to increase corporate social performance (Arora and Dharwadkar 2011; Hafsi and Turgut 2013). However, given the characteristics described above, it seems likely they would have an interactive influence on corporate social performance. Therefore, we expect outside directors—and their focus on stakeholder issues—to have an *amplifying* effect on female directors' support for increased stakeholder accountability, by lending increased credibility (as they are generally more representative of stakeholder groups) in positive support of such activities. Therefore:

Hypothesis 3 The presence of more outside directors will positively moderate the hypothesized relationship between female directors and corporate social performance.

Methods

Sample

Our sample is drawn from several databases. The firms in our sample are all from the USA, which helps us to control variation due to the institutional setting. For example, what may be viewed as CSR in one country may be a regulation in another—this makes cross-national comparisons problematic. The sample period is from the 2007–2011 period (inclusive), so we use a fixed effects panel model to analyze the data. We are restricted to these years because of data availability. We are interested in large, publicly traded firms predominantly in the USA. The S&P 500 allows for better data (as it does not include private firms) and is frequently used in CSR research (Liston-Heyes and Ceton 2009; Lougee and Wallace 2008). The sample size is reduced to include only firms for which complete data existed, for a total of 577 firm-years of data.

Endogeneity

As discussed in a review by Bascle (2008), endogeneity can be problematic in one of three ways. First, there could be errors in variables (where the actual value of independent variables is not observed). This is not a problem for this study because all of the independent variables are directly observed. Second, there is a potential for omitted variables to cause endogeneity. In this study, we control for several alternative explanatory variables in a longitudinal setting, so omitted variable bias is also unlikely to be present. Finally, simultaneous causality could be problematic, where outcome variables are affected by explanatory variables, and vice versa. We correct for this by lagging the dependent variable, which should more clearly demonstrate the effect the independent variables have on the outcome variable.

Dependent Variable

The dependent variable (DV)—corporate social performance—comes from the Kinder, Lydenberg, Domini Research and Analytics (KLD) database. The KLD database includes data on the 3000 largest US companies. These KLD ratings include dimensions such as community, corporate governance, employee relations, diversity, environment, human rights, and product concerns. The measure is an aggregate of KLD ratings in various areas as originally proposed by Ullman (1985). The method is commonly used in later research (Hull and Rothenberg 2008; Jayachandran et al. 2013; McWilliams and Siegel 2000; Waddock and Graves 1997).

Overall, we use 68 different dimensions in the KLD data to measure corporate social performance. This includes measures as varied as whether the company had product safety issues, actively pursued pollution prevention, had a profit sharing arrangement with employees, and so on. Broadly, the categories in the KLD database can be summarized as follows: community, governance, diversity, employee relations, and the environment. KLD also includes exclusionary screen data for firms that sell products containing 'controversial' substances such as alcohol and tobacco. These are not used as they are very industry-specific and are arguably not central CSR issues (Strike et al. 2006). This variable (the aggregate of KLD scores as described above) is then advanced one year to show the effect of existing board dynamics and existing alliance structure on future corporate social performance, and log-transformed because it is sufficiently non-normal. For robustness, this is also compared with a 2-year and 3-year lag—no substantial variation in results is found. The log transformation has little effect on the actual results, but is done as is standard practice in regressions with significantly non-normal variable distributions.

Independent and Moderating Variables

The independent variable for Hypothesis 1, alliance network centrality, is derived from data retrieved from SDC Platinum alliance data for alliances in the years 2007–2011. Following earlier studies, we use a 5-year window for the alliance network (Gulati and Gargiulo 1999; Lavie and Rosenkopf 2006; Stuart 1998; Yang et al. 2011). This is because alliance contracts, generally, last no more than five years (Kogut 1988; Yang et al. 2011). For each year in our data, a 5-year window ending on that data year is computed. Centrality is calculated using UCINet's eigenvector centrality measure, as is commonly used in alliance network research (Gulati 1999). Eigenvector centrality measures the influence of a node in a network. It gives more weight to a node's overall influence on the network rather than local network idiosyncrasies. This variable is also log-transformed.

The independent variable for Hypothesis 2, percentage of female directors, comes from the RiskMetrics database in Wharton Research Data Services. The years for these data are 2007–2011 as well. This data set is our constraining variable on the dataset—a larger panel would have been possible but RiskMetrics only has data from 2007 on. The actual total of female directors (outside and inside) in a given year is divided by the total number of directors to obtain a percentage—essentially controlling for variation among differing board sizes to make comparability possible. This variable is also log-transformed.

The moderating variable for Hypothesis 3, outside director percentage, also comes from RiskMetrics. This variable is also for the years 2007–2011, is measured by total number of outside directors divided by total number of directors (for comparability), and is also log-transformed.

Control Variables

Firm size. Firm size has been shown to affect corporate social performance (Johnson and Greening 1999). Therefore, total assets are included as a control because larger firms obviously have greater financial ability to participate in CSR activities. These data come from the Compustat database. This variable is log-transformed because it is significantly non-normal.

Firm financial performance. As a proxy for firm financial performance, net income is included as a control. The greater the net income, the more ability directors may have to influence their favorite projects such as CSR initiatives. Regardless of firm size, net income demonstrates what discretionary powers director may have. For example, a very large firm may be having difficulty and as a result report low net income. This obviously is a scenario which would depress corporate social performance as, in the minds of many managers, CSR is considered more of an optional effort, and not critical to a firm's success. Previous studies have shown this to be a factor in corporate social performance (Waddock and Graves 1997). These data come from the Compustat database and are also log-transformed.

Advertising intensity. Previous work argues that advertising intensity increases corporate social performance (McWilliams and Siegel 2000; Strike et al. 2006). This variable is calculated as annual advertising expense/total sales. These figures come from the Compustat database. Again the variable is log-transformed.

R&D intensity. R&D intensity is measured as a ratio of R&D expenditures divided by total sales. McWilliams and Siegel (2000) and Strike et al. (2006) show it to be a crucial expenditure for long-term viability. CSR studies that omitted it might have overemphasized the effect of corporate social performance had on firm financial performance. While we are not examining firm financial performance per se, this concern shown in earlier studies is enough to control for it. These data also come from Compustat. This variable is also log-transformed.

Debt ratio. Debt ratio is defined as long-term debt divided by total assets. Using some of the same logic as with net income, more debt may also constrain the firm's ability to participate in what would otherwise be viewed as optional for the firm. Again, these data come from Compustat and are log-transformed.

Board size. Previous studies have shown board size to be a determinant for corporate social performance (Post et al. 2011), so it is included here as well. These data are from RiskMetrics.

CEO duality. This variable is often used as a control in studies where board composition is examined (Peng 2004). The data come from RiskMetrics and represent when the same person holds both the CEO and Chairman positions. It is a binary variable.

Estimation Strategy

We use a fixed effects panel regression to test our proposed effects. A discussion of industry controls is important here. As the year-to-year variation in the same firm on industry is very minor if at all, industry controls cannot be included in the regression as they will simply be excluded for collinearity. Instead, the panel regression is run using the four digit North American Industry Classification System (NAICS) code as the fixed effect grouping. This allows for industry effects to be controlled, something that is important given the large variations of corporate social performance by industry. Three regressions are run, Model 1 includes with just controls, Model 2 adds the variables for H1 and H2, and Model 3 represents the full model.

Results

Table 1 reports the descriptive statistics and bivariate correlations for the variables in the regression. The fixed effects regression results are reported in Table 2. Model 1 shows that most of our controls are significant, and in the directions consistent with expectations. In Model 2, the independent variable *centrality* is quite significant (at the 0.01 level). The coefficient is in the hypothesized direction of Hypothesis 1, which stated that more central firms would have higher corporate social performance. Thus, Hypothesis 1 is supported. Additionally, the independent variable *female director percentage* is also quite significant (at the 0.01 level). The coefficient here is also in the hypothesized direction, which is that the higher the percentage of female directors on a board, the higher the corporate social performance of the firm. This then provides support for Hypothesis 2.

In Model 3, the moderator test of *female director percentage* × *outside director percentage* is also significant in the hypothesized direction. This provides support for

Table 1 Descriptive statistics and correlations

	Variables	Mean	SD	1	2	3	4	5
1	Corporate social performance (CSP)	2.34	0.37	1.00				
2	Total assets[a]	7.92	1.75	0.36	1.00			
3	Net income[a]	10.34	0.09	0.29	0.52	1.00		
4	Advertising intensity[a]	−4.58	1.42	0.21	0.24	0.13	1.00	
5	R&D intensity[a]	−2.89	1.35	−0.05	−0.28	−0.05	−0.16	1.00
6	Debt ratio[a]	0.14	0.14	0.03	0.32	−0.01	0.21	−0.26
7	Board size	9.13	2.14	0.29	0.65	0.29	0.2	−0.4
8	CEO duality[b]	0.64	0.48	0.14	0.15	0.11	0.05	−0.23
9	Centrality[a]	0.01	0.04	0.31	0.35	0.46	0.04	0.1
10	% Female directors[a]	0.12	0.09	0.42	0.48	0.24	0.26	−0.27
11	% Outside directors[a]	0.58	0.06	0.14	0.17	0.07	0.02	−0.11
	Variables	**6**	**7**	**8**	**9**	**10**	**11**	
7	Board size	0.29	1.00					
8	CEO duality[b]	0.06	0.08	1.00				
9	Centrality[a]	−0.08	0.13	0.03	1.00			
10	% Female directors[a]	0.19	0.47	0.12	0.12	1.00		
11	% Outside directors[a]	0.05	0.12	0.10	−0.01	0.21	1.00	

$N = 577$. CSP is measured at $t + 1$, all other variables are measured at t. Correlations larger than |0.07| are significant at $p < 0.05$

[a] Variable is logged

[b] Variable is dummy coded

Hypothesis 3, that the more outside directors present would positively moderate the effect of female directors. The R-square value in the full model (Model 3) is greater than the one with just the independent variables (Model 2), and that one in turn is greater than the one with just the control variables (Model 1). This demonstrates that our models progressively create a better fit, with Model 3 showing the most complete picture of the determinants of corporate social performance.

Figure 1 shows the moderation effect of outside directors on female directors. The effect is positive in all four cases (none of the predicted situations drop below the x-axis), and it demonstrates that the effect of outside directors does enhance the effect of female directors on corporate social performance quite clearly.

As a further robustness check of the interaction, the sample is bisected by the median of female director percentage. A separate regression is run only including records where female director percentage is below the median, using the second model. The outside director effects are found to be insignificant as a main effect (with a p value of 0.284). Therefore, we can comfortably say that outside directors do not have a direct effect, but are instead truly a moderator on the relationship between female directors and corporate social performance.

Discussion

Our study contributes to the literature in three ways. First, network theory effects (at least centrality) have significant effects on corporate social performance. Firms that are more central in an alliance network are more likely to have higher corporate social performance. As discussed earlier, the RBV provides an explanation—firms that are more central in an alliance network have desirable, tangible resources that can be obtained through alliance partnerships. Firms on the periphery, however, are less likely to have such resources. This suggests that these firms may have intrinsic resources that are not easily transferred in an alliance relationship.

Second, we have established a clear relationship between the presence of female directors on a board and the corporate social performance of the firm. This extends stakeholder theory beyond earlier work that merely looked at philanthropy (one relatively narrow dimension of corporate social performance) as a result of female directorship. The theory is now encompassed in the much larger net of corporate social performance. Previous studies have shown improvements in philanthropy, the environment, and other areas, but few if any have examined the broader construct of corporate social performance and the influence of female directors.

Table 2 Fixed effects regression of corporate social performance

Variables	Model 1	Model 2	Model 3
Total assets[a]	0.087***	0.058***	0.056***
	(0.000)	(0.000)	(0.000)
Net income[a]	0.357**	0.288*	0.270*
	(0.021)	(0.066)	(0.084)
Advertising intensity[a]	0.013	0.007	0.008
	(0.194)	(0.446)	(0.376)
R&D intensity[a]	0.034*	0.043**	0.044**
	(0.075)	(0.018)	(0.016)
Debt ratio[a]	−0.149	−0.102	−0.135
	(0.164)	(0.313)	(0.184)
Board size	0.031***	0.017**	0.020**
	(0.000)	(0.041)	(0.019)
CEO duality[b]	0.075***	0.045*	0.040*
	(0.003)	(0.066)	(0.099)
Centrality[a]		0.892***	0.931***
		(0.004)	(0.003)
% Female directors[a]		1.221***	−1.580
		(0.000)	(0.197)
% Outside directors[a]		0.353*	−0.110
		(0.091)	(0.703)
Female directors × outside directors			4.804**
			(0.021)
Constant	−2.166	−1.446	−0.993
	(0.166)	(0.367)	(0.537)
N	577	577	577
R^2	0.298	0.390	0.393
F	39.852	38.266	35.569

Robust standard errors in parentheses. Two-tailed tests for all variables

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

[a] Variable is logged

[b] Variable is dummy coded

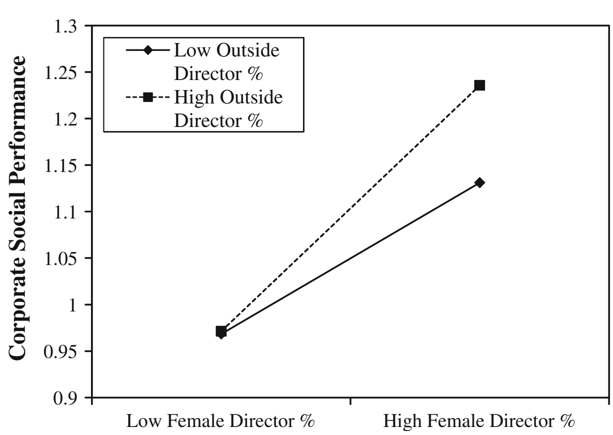

Fig. 1 Moderating effect of outside directors on female directors and corporate social performance

Third, we have shown the role that outside directors have on corporate social performance as an enhancing moderator for female director representation. The presence of outside directors amplifies the relationship between female directors and increased corporate social performance. In sum, our research offers some support for both RBV and stakeholder theoretical frameworks.

Limitations and Future Directions

While much previous research has used the KLD data in a manner similar to ours, increasingly there is criticism for the oversimplified nature of aggregated ratings. This criticism generally revolves around the idea that different KLD measures have different 'value' in terms of a composite of CSR. For example, how much is charitable giving 'worth' compared to volunteer programs? Are they worth the same, or is one more important when building an aggregate measure? Some argue that an aggregate measure can never capture these variances well (Jayachandran et al. 2013). However, we feel that there is still value in looking at CSR (and thereby corporate social performance) in a holistic fashion, as other recent work has done (Marano and Kostova 2016).

One limitation of this study is that unfortunately, a disappointing number of cases are dropped because of missing data. For example, advertising intensity is only reported for about half of the firm-years in our original sample. Similarly, R&D intensity is only reported for about 60 percent of our firm years. This is the result of Compustat's data not being complete in these areas. We could have benefited from a data source that includes more complete data as it would have improved this study by increasing the number of firm years for hypothesis testing. Nevertheless, we are confident in our findings because they account for important controls that provide more assurance in the reported results.

A further extension of this work would also be to integrate the role of additional board characteristics. Previous work, for example, has noted that specific board characteristics, such as monitoring roles (such as CEO duality, independence, and percentage of directors appointed after the CEO took office) and resource provisioning roles (such as busy boards, boards with CEOs from other firms, and lawyers on boards) have an effect on environmental performance (de Villiers et al. 2011). The CEO's political orientation has also been shown to have an effect on corporate social performance of a firm (Chin et al. 2013). Including these additional board characteristics to extend the current study would further improve our understanding of the relationship between boards and corporate social responsibility.

From a diversity perspective, we only use gender in this paper. However, it is certainly not the only measure of diversity that may be relevant. Ethnicity is a dimension of boards that we do not directly address, and might have some interesting results in a similar analysis. In exploring future work, an emphasis on differences among diverse groups could be beneficial. For example, instead of strictly measuring diversity as an effective mix of different ethnicities (Andrevski et al. 2014), it would be useful to see if specific ethnicities contribute disproportionately to CSR and if they have similar effects as to what we found for the percentage of women directors. For example, would the percentage of African-American directors more strongly moderate the alliance centrality network-to-corporate social performance relationship than the percentage of Asian Americans? Although we realize that many large US companies' boards do not have a critical mass of specific racial minority subgroups, we advise similar to Chrobat-Mason and Aramovich (2013) against lumping all racial minorities into one minority group to access percentage of racial minority on the board because of their unique racial/ethnic experiences that warrant attention.

Also, an international dimension could be additive, particularly with respect to female directors. Recent work illustrates that differences among firm financial performance as a result of the presence of female directors depend on how gender egalitarian the context is (Post and Byron 2015). It seems logical, based on their work, to speculate that our results would likely be similar if not stronger in a high-egalitarian nation such as Denmark and that our results might be weaker in a low-egalitarian nation like Nigeria. Adding data from international contexts would illustrate whether the work exploring uneven effects of female directors on firm financial performance based on the level of egalitarianism with regard to gender in a nation would be applicable to corporate social performance outcomes as well.

Finally, we share the enthusiasm Rao and Tilt (2016) have for understanding on a deeper level how female directors and outside directors actually shape decision making on boards, and how that leads to better corporate social performance on the part of firms. Their suggestions include using qualitative methods to examine decision making on boards directly. We agree this would be a valuable step in understanding how female directors shape decision making.

Conclusion

Ultimately, we believe this paper is a solid first attempt at examining network measures as antecedents of corporate social performance. We have made and substantiated our case, suggesting that alliance network centrality and the presence of women on the board positively affect corporate social performance.

We contribute to the literature on the RBV by describing how network position or importance (centrality) is a desirable resource, which assists firms in the creation of corporate social performance. The implication is that promoting relationships between less central firms and more central ones can be used as a mechanism to gain knowledge to improve corporate social performance.

Stakeholder theory predicts that female director representation on boards may also improve corporate social performance, and our empirical tests support this view. Further, we find that the presence of outside directors amplifies the effect of female directors on corporate social performance, as is also expected by our theoretical lens of stakeholder theory.

For practitioners, we offer several new insights on how to improve corporate social performance and stakeholder relationships. First, it is important for firms that desire greater corporate social performance to partner with firms that themselves are important players in the firm alliance network. Firms that are central, that have many relationships with other firms that also have more relationships, tend to have higher levels of corporate social performance. As discussed, an alliance relationship can be an effective way of learning from alliance partners' strengths, including in the area of corporate social performance.

Second, we suggest that the makeup of a board of directors is crucial if firms desire corporate social performance (and likely better stakeholder relations) as an outcome. Appointing more female directors to a board, with a higher percentage of outside directors, seems to be a useful way to leverage these individuals' assets to improve a firm's corporate social performance. Our study shows that these leaders drive the creation of corporate social performance in firms. This, in turn, should provide great benefits in terms of stakeholder relations as well, as stakeholders generally value firms with relatively high levels of CSR (as this indicates an interest in managing stakeholder concerns far beyond those exclusively of shareholders).

As stakeholders and the general public continue to clamor for more CSR activities on the part of firms, enhancing our understanding of this phenomenon—especially along the intriguing but relatively underexplored dimensions of alliance network centrality and board composition—becomes increasingly important for researchers and practitioners as well.

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