

Impact of Director's Network on Corporate Social Responsibility

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Abstract

Prior studies have focused on director's political ideology, their external pressure, financial incentives and corporate reputation in relation to corporate social responsibility (CSR). However, a little attention has been given whether directors' personal and professional networks can influence the CSR performance of firms. In this study, we investigate the effects of director's network on their CSR performance. Using an unbalanced panel data of 785 publicly listed firms from 28 countries during 2003 – 2016, we find that while director's professional network positively affects their CSR activities, their personal network, in fact, does the opposite. In addition, director's network centrality advances the CSR performance of their firms. These results are confirmed by addressing endogeneity issue arising out of simultaneously determined director's network and CSR score of firms and unobserved firm characteristics that are correlated with CSR score and directors network. Our findings contribute to the academic literature related to director's network by providing new empirical evidence and a better understanding of the decisions and activities that directors undertake, when deciding their CSR and also help policymakers to understand the importance of director's networks as a determining factor of CSR policies.

Keywords: Director's network centrality, corporate social responsibility (CSR), corporate governance, board of directors, financial crisis.

1. Introduction

With the rapidly changing global trading environments, corporate social responsibilities (hereafter CSR) have become an international focus towards firm's strategies related to better firm performance (Eberhard and Craig, 2013; Kim, Kim and Qian 2015). Prior studies find that financial performance of firms improves when firm's executives, board members, and other financial market participants are connected to each other (e.g., El-Khatib, Fogel and Jandik, 2015). Improved firm performance not only provides incentives to engage in CSR (Lins, Servaes and Tamayo, 2017), but firms performing better in CSR also face lower capital constraints, as high CSR performance is related to better stakeholder's engagement (Benabou and Tirole, 2010). To understand the motivation and incentive for directors to engage in CSR, recent studies on CSR have focused on a number of areas such as political ideology of executives (Gupta, Briscoe and Hambrick, 2017), gender and family background of CEO (Bear, Rahman and Post, 2010; Cronqvist and Yu, 2017), improvement of employee behaviour (Flammer and Luo, 2017) and better access to finance (Cheng, Ioannou and Serafeim, 2014). However, existing studies do not investigate the cross-country variation in director's networks with their peers and the impact of these networks on CSR performance.

Since, directors of firms allocate a considerable amount of time and resources to their CSR strategies (Chen, Wang, and Lin, 2014; Cheng, Ioannou and Serafeim, 2014), they usually associate themselves in a network with external stakeholders (Jacobson, Hood and Van Buren, 2014). Therefore, to extend these studies, we draw attention to director's network that influences the director's effectiveness in their CSR by measuring director's educational network, their current employment, historical employment and independent directors.

Director's networks have a substantial impact on firm's financial performance (Larcker, So and Wang, 2013; Baran and Wilson, 2018; Rossi et al., 2018) which is positively related to CSR activities of firms (Lins, Servaes and Tamayo, 2017). Singh and Delios, 2017 show

that director's networks improve access to valuable information in terms of cost, quality, and timeliness. Although we find empirical evidence of the impact of CSR and director's network on firm performance, no evidence shows the impact of director's networks on CSR activities of firms. Thus, in this paper, we examine how do the directors' networks affect CSR activities of the directors?

Following literature, we find evidence of different types of networking -such as personal connections and professional connections (Ostgaard and Birley 1994; Liu 2014) to examine the impact of each type of mentioned network on CSR across countries (Faleye, Kovacs and Venkateswaran, 2014; Renneboog and Zhao, 2014; El-Khatib, Fogel and Jandik, 2015). In addition, to strengthen our findings, we measure network centrality, which identifies the central position within network relationships (Freeman, 1977). Higher centrality enables directors to obtain valuable information (Ahuja, 2000) which allows them to anticipate their firm's CSR strategies. Directors with varying background and job profile differ regarding how connected they are with their top leaders' team. Thus, it is important to consider the centrality of directors in a network to capture the complete picture of the impact of director network on CSR performance. Following, Bebchuk, Cremers, and Peyer, (2007), we use the term 'director's network centrality' to refer to the importance of the certain position of directors in a network, in terms of ability and contribution that director has within their firms.

In this paper, we aim to address the research gap by investigating the impact of distinct network types such as professional and personal networks on the different type of CSR. The existing literature has considered environmental and sustainability behaviour of firms to explain different types of CSR (Kim, 2015). Following previous literature, Kim, Kim, and Qian, (2015); Pisani et al., (2017), we consider firms' environment and social scores to capture types of firm's CSR. Environment score refers to those aspects of CSR addressing

issues related to the natural environment, whereas social score refers issues related to the social environment (Bebchuk, Cremers and Peyer, 2007).

The financial crisis has revealed a strong interconnection between economy and financial market (Fiordelisi and Mare, 2014). As CSR is highly related to firm performance, it raises questions that how instability in the financial market impacts the types of director's network and in turn the CSR of the firms during the time of financial crisis. Because of an increase in the number of bankruptcies during the financial crisis, firms tend to focus on their ethical part of the organization (Burlea et al., 2010).

Firms' relationship with the financial sector strengthened during the financial crisis, and one of the reasons the relationship strengthened according to Heemskerk, (2013) was to support each firm and communicate, which in the long run had a strong impact on director's network. These relationships known as networking has increased the directors' social capital and enabled the firms to raise more capital and achieve higher valuations during the financial crisis (Lins, Servaes and Tamayo, 2017). However, there exists a gap in the literature about how the financial crisis impacts the directors' network related to CSR, which we address in this paper.

To empirically examine the impact of director's network centrality on CSR, we use an unbalanced panel data comprising of 785 publicly listed companies from 28 countries during 2003 – 2016. We find a significant and positive relationship between director's professional network and CSR; we also find a positive relationship between director's network centrality and CSR. However, the relationship between director's personal network and CSR is negative. We also find the decrease in CSR activities during the period of financial crisis, as firms tend to direct their focus towards company's strategic and management decisions during the financial crisis.

The findings of our study contribute to the academic literature in several ways. Our study adds to the emerging literature on the effect of director's network on CSR in developed and developing countries. We also contribute to director's professional, personal and centrality networks, types of CSR, and to the literature of director's network, CSR, and financial crisis. Our study also provides theoretical contribution by recognising inside and outside directors and their impact on personal and professional networks. In a recent study, Jacobson, Hood and Van Buren, (2014) theoretically highlight how director's internal and external networks influence CSR. However, the study fails to give any empirical evidence on personal and professional director's network that brings financial stability leading to CSR. In addition, to our best knowledge, our paper is the first attempt to provide further evidence on the country level variation of CSR engagement facilitated by the personal and professional network of directors. Results of this study will assist the policymakers to assess the policies more effectively so that they can identify a complete framework related to CSR and can understand to what extent they should consider directors' network's influence on CSR. Our analysis will also guide directors in developed and developing countries to understand to what extent they need to strengthen which types of network to diffuse and implement CSR in their firms successfully.

The remainder of this paper is structured as follows: first, we present a review of the related literature, the theoretical model on director's network and CSR and hypothesis development. We then discuss the research methodology employed in the study and report the results and robustness tests. In the last section we draw a conclusion about the impact of directors' networks on different types of CSR, discuss theoretical and practical implications and limitations of our study and indicate directions for further research.

2. Literature Review

Corporate governance (CG) refers to a system by which the firm is controlled and directed (Singh and Delios, 2017). It reflects a series of mechanisms through which the interest of board directors, management, shareholders, and other stakeholders are set out. A large body of empirical evidence suggests that directors are vital in determining factors in controlling and directing firm's operations related to CSR (Ocando, 2017). Firms that create networks through a board of directors are a vital feature shaping the organisation's environment (Braun, Briones and Islal, 2018). A well-connected director has the experience, knowledge, and external connections (Intintoli, Kahle and Zhao, 2018) to effectively increase firm performance and CSR. As directors play an essential role in managing firms, their primary tasks involve monitoring, strategic decision making, and networking (Zona and Zattoni, 2007; Francoeur et al., 2017).

One of the key matters in networking (Granovetter, 1985) is how a network of connections can influence the behavior of directors. Han et al. (2017), specifies director's network as one of the essential connections among firms, which have been proved to be a credible and costless channel of information diffusion. Based on this information diffusion function (Chiu et al., 2013), director's network connections can act as an instrument to improve firm's CSR performance.

Following Cai and Sevilir, (2012), we define a director's network a collection of ties with all the connections that exist among other directors. These ties can be formed when two directors share the same board, or they shared the same board in the past, they sit on the same board as independent directors, or they graduated from the same institute. For a very long time, networks have been a contentious phenomenon as directors are thought to be compromising the effectiveness of the firm by forming different types of networks (Ocando,

2017). It is vital to understand director's networks who effectively act in the interest of firm's CSR decision-making process. Helmers et al., (2017), show that the larger the network size of the directors, the more likely they are exposed to information and ideas to improve firm performance; hence, they are likely to suggest changes in CSR activities of the firm.

Prior literature suggests that director's network ties are crucial information transmission channel and it has a direct effect on the diffusion of practices among firms (Han et al., 2015; Bizjak, Lemmon, and Whitby, 2009; Haunschild and Beckham, 1998). For instance, Davis (1991) claim that when a firm adopts a poison pill, the likelihood of its director's interlocked firms taking the same poison pill will increase. Another literature suggests that firms are more likely to adopt the multi-divisional structure if their interlocking directors have also adopted it (Palmer, Jennings, and Zhou (1993). To summarise, director's networks is one of the most important information channels because it is significant for firm performance which then has an impact on firm's CSR.

First time in decade large number of firms collapsed, or some of the firms were bailed out by governments due to the global financial crisis (Erkens, Hung, and Matos, 2012). Motivated by the significance of the global crisis, previous literature has attempted to examine the causes and consequences of the global financial crisis (Huizinga; Laeven 2012 and Balakrishnan, Watts and Zuo (2016). During the financial crisis, directors have received attention and have undergone to reforms their structure of boards of directors (Essen, Engelen and Carney, 2013). A board of directors is a team of individuals with fiduciary duties of leading a firm including during the period of hardship. Therefore, directors are responsible for setting a corporate goal of the firms. To ensure adequate performance of the firm, directors should pay attention to their networks. The financial crisis highlighted the importance of networks for firms and their financial stability (Lins, Servaes and Tamayo, 2017). Literature makes it clear that director's networks are essential source during the crisis

period. In this paper, we provide empirical evidence on which type of director's network effect CSR.

Theoretical Framework

Many theories have been utilised to explain the relationship between director's network, CSR and firm performance. Existing literature has primarily focused on the characteristics of the board such as board size, age, and tenure, etc. and other issues affecting firm performance such as ownership and CEO compensation (Fama and Jensen, 1983; Davis, Schoorman and Donaldson, 1997; Muth and Donaldson 1998; Lausten 2002). This section will review and summarise some of the essential theoretical perspectives of director's professional and personal network effects and CSR that are considered relevant for this study: stakeholder's theory, institutional theory, and network theory.

The research gap mentioned above is explained with the following theoretical model.

Stakeholder Theory

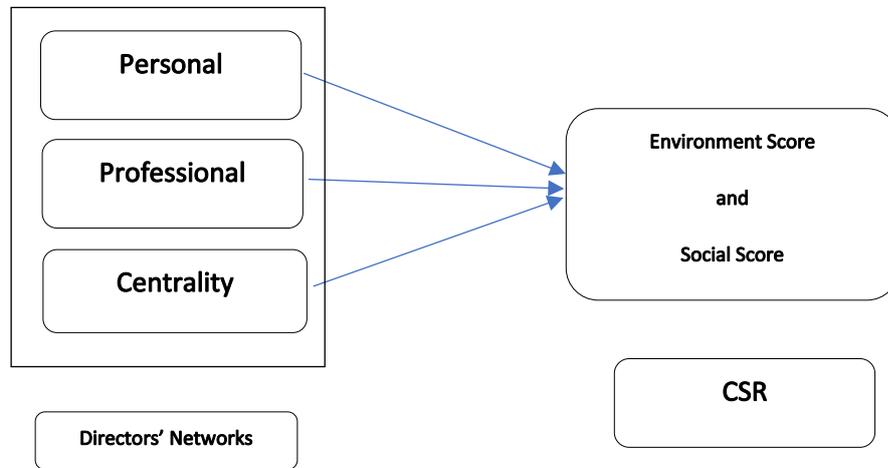
The theoretical framework is based on stakeholder theory adopted by Freeman (1994). This theory explains the relationship between shareholders (principle) and directors (agent). Stakeholder theory address how directors perform their duties, i.e., directors should make decisions taking in account the interest of all the stakeholders of the firm including CSR, and its intimately connected firm performance (Laplume, Sonpar, & Litz, 2008). Stakeholder theory suggests that the nature of firm's directors and their decisions are relevant information for predicting performance of firm's CSR (Brenner and Cochran, 1991; Humphry Hung, 2011). The goals of a firm is to improve CSR which can be achieved by balancing the interests of these different stakeholders such as employees, shareholders to whom the corporation is responsible (Freeman, 1994; Clarkson, 1995).

Donaldson and Preston (1995) describe theory in three different perspectives. (1) The descriptive perspective where directors empirically make use of the theory to show the steps they are taking for the firm's CSR. (2) Instrumental perspective is used to identify the connection between directors and the achievement of CSR (Heskett and Kotter, 1992). Finally, the (3) Normative perspective examines how directors should behave and their motivations towards the improvement of firm's CSR. The conceptualisation of these perspectives requires the development of the appropriate research models which we provide in this study by linking three perspectives to find influence of director's network on CSR. Directors are seen as important role players to integrate environmental, social, ethical and human rights concerns into their firms with the aim to increase the value for their shareholders. While previous literature viewed shareholders and CSR aggregated measure, there is a strong view that the different dimensions of directors affect CSR such as director's network which we will examine in this study.

Besides, we apply the following theoretical framework adopted from Waldman, Siegel and Javidan, (2006) to strengthen the theoretical underpinning of the research model.

Diagram 1

Director's networks and CSR



In this theoretical framework model, the authors explain that personal and professional network among firm leaders influences the firm's CSR. Similarly, in our research, we are aiming to find the impact of personal and professional networks on CSR. In addition, we are introducing the crisis period which will help us to extend this existing theoretical model. This model is applied to theoretically examine how different types of network explain the different types of CSR before and after the financial crisis.

Institutional theory

Institutional theory (IT) provides a non-economic explanation of firm's behaviours and strategies (Yang and Su, 2014). A firm's strategic actions may not be free possibilities determined solely by economic arrangements but can be regarded as a choice among a narrowly defined set of legitimate options determined socially within the organizational field (Deligonul et al., 2013). DiMaggio and Powell (2000), explains that an organizational field is a set of actors and practices that constitute an area of institutional venue and these actors can be described as directors. The venue may include key stakeholders and policy makers.

Organizational fields are quite often well established and highly structured under rules and behaviour of director's. Melo (2001), develops an institutional approach to analyse collective actions in industrial networks. The focus is on how a group of directors develop institutional relationships that can support their decision-making process. This literature motivated us to consider the institutional theory in explaining the impact of director's network in our study. Deligonul et al., (2013); Anndersen Christensen, and Demgaard (2009) apply three institutional pillars and discuss how their institutional environments influence firms from different parts of the world and how this influence shapes their expectations within inter-firm relationships. They argue that the legal, regulative and cognitive pillars in society can influence norms and expectations within buyer-seller relationships. As CSR strategies influence the relationship with stakeholders so we introduce the institutional theory to explain the theoretical model in our paper. In addition to stakeholder's theory we applied the institutional theory to explain the impact of different types of networking before and after the crisis on CSR.

Network theory

Director's networks influence economic outcomes for two main reasons: They influence the quality of information, and act as an important source to build trust in relationships. Network theory (NT) studies show the structure of relationships around director's or organisations and how it affects their behaviours. According to Wellman (1983) and Brown et al., (2012) within firms' networks between directors are vital as it may affect their independence and behaviour.

The size of director's network capture by the number of the ties exists within their circle. Wegner (1991), describe networks as a dichotomy, as they are classified as either weak or strong ties. Director's tie's strength reflects the closeness of the relationship between

directors. Directors with strong network ties indicate similar background and are in frequent contact. Director's weak network ties characterized as 'distant' and infrequent connections between directors (Brown et al., 2012). Granovetter (1985), argue that strong network ties provide similar information as each tie of network can make marginal contribution to the information base. In contrast, weak network ties more likely to be sources of new information with higher value to the network ties (Strahilevitz, 2005).

Director's network ties can also be conceptualized as direct or indirect networks (Brown et al., 2012). Previous literature such as Larcker (2013); Fracassi and Tate (2012); Cohen et al., (2010); Gulati and Westphal (1999), only focus on board's direct network ties, i.e. directors sitting for the same boards. We argue that direct network ties only capture current network ties, ignoring the indirect ties such as director's shared same board in the past. As a consequence, the size of director's network ties is underestimated. Thus, to get a better understanding about impact of directors' network on CSR especially before and after financial crisis we strengthen our theoretical model by incorporating NT along with the above-mentioned theories.

2.1. Hypothesis Development

Directors' professional networks and CSR

Many studies have examined the relation between CSR and financial performance through a theoretical and an empirical lens (Adams et al., 2015). The range of CSR activities of firms is extensive, i.e., firm may develop products that are made of environmentally- friendly materials, work closely with community organizations or donate to charities (McCarthy, Oliver, and Song, 2017; Yang and Liu, 2018), which describes and proves the importance of CSR in firms and society. In recent studies, CSR has been considered as 'important' or 'very important factor' of businesses' future success (Cheng, Ioannou and Serafeim, 2014). Firms

affecting CSR performance likely to disclose their CSR activities (McCarthy, Oliver and Song, 2017), which shows their long-term motivation towards environment and society. Even though CSR is becoming increasingly significant, research still shows that CSR performance by some countries is limited compared to others (Golob and Bartlett, 2007; Chen and Bouvain, 2009). One of the main reasons is lack of network within the primary decision-makers, in particular, boards of directors who are considered to be the key players in firms' CSR achievements (Adler and Kwon, 2002).

Director's networks have attracted growing academic attention in the field of business and corporate governance (Renneboog and Zhao, 2014). There is a definite link between director's networks and firm performance (Geletkanycz, Boyd and Finkelstein, 2001; Larcker, So and Wang, 2013; Renneboog and Zhao, 2014; Benson et al., 2018; Baran and Wilson, 2018). These networks are formed through common education, work experience, interconnecting board seats, and interconnecting board meetings, etc., which provide channels to exchange valuable information (El-Khatib, Fogel and Jandik, 2015). Researchers find that directors with large network connections have better access to information (Fernando Anjos and Cesare Fracassi, 2014; Singh and Delios, 2017). Thus, we consider director network as an important aspect to be examined in CSR related studies.

Though previous literature finds the impact of CSR and director's network on firm performance separately, there are very fewer studies focus on the impact of director's network on CSR. Thus, by examining the impact of directors' network centrality on CSR, we will fill the existing gap in the literature of CSR.

Recently, the importance of CSR is broadly discussed within the global community both by practitioners and researchers (Pisani et al., 2017). In developed countries such as US and UK, corporate communication in firms is often used to highlight firm's commitments to CSR (Li et al., 2010), improving their markets efforts and enhancing their relationship with their

stakeholders. Firms face a variety of demands from their stakeholders, where socially responsible behavior is one of them (Freeman, Harrison and Wicks, 2007).

CSR is important for every firm for some reasons (1) it strengthens their relationship with their stakeholders (Sen, Bhattacharya and Korschun, 2006) and (2) improve the long-term competitiveness and profitability (Carroll and Shabana, 2010). The directors of the firms are key leaders to play a significant role in deciding CSR for their firms. For firms to be socially and environmentally responsible, directors must work with other directors to exchange their information and ideas, to learn different types of CSR. Although CSR is growing significantly, CSR performance is still limited in some countries particularly in developing countries (Chen and Bouvain, 2009; Rao and Tilt, 2016). Directors are responsible and accountable to a broader range of stakeholders, therefore, examining director's network and their influence on CSR across countries is important. Prior studies have mainly used environment disclosure and environmental performance to measure CSR (Al-Tuwaijri, Christensen and Hughes II, 2004; Clarkson et al., 2011), but there are only a few studies investigating all of the elements of environment and social performance together and especially, how different types of director network could influence types of CSR. Our discussion to this point makes clear that director's professional networks contribute towards CSR. Therefore, we propose the following hypotheses:

Hypothesis 1: Director's professional networks are positively related to CSR

Directors' personal networks and CSR

Personal networks of directors have been identified as important resources for firms (Johannisson, 1998). We consider that personal network of a director with other directors exist before the director joins a firm, that is, directors in personal network have studied together at the same institute (In this study, we do not consider the other factors for personal

network such as ethnicity, language etc.). Through personal networks, directors can attain information on how firms are maintained, sustained and developed (Nelson, 2001; Jack, 2010). Personal networks also open opportunities for directors to enhance the quality of strategic choices and reduce the risk of innovation investments (Faleye, Kovacs and Venkateswaran, 2014). In other words, personal network helps in crucial decision-making process because people linked in this network can give impartial suggestions and information. However, prior studies in the area of personal network document that there may be a falling return by introducing new relations (Deeds and Hill, 1996). This type of network can provide a variety of resources. But if the firm does not have appropriate absorptive capacity, information and resource overload become obvious. So, it can trigger a fall in relation with another network (Fombrun, 1982). A number of studies have discussed about the structural hole and its impact on network (e.g. Burt 1992). Dodd and Patra (2002) argue that personal network can have a negative impact on firm performance through lack of structural holes in the network.

Institutional theory suggests that where weak institution and underdeveloped capital market bring challenges in internationalization of firms, personal network (often informal) plays an important role. Luo and Chung (2005) find that family and prior personal contact can facilitate business groups' financial performance. Baum, Calabrese and Silverman, (2000) describe personal networks as opportunistic, positive and trust building tools. But, high level of trust in relationship can be counterproductive, because it can lead to limited information processing and consequently firms can lose to identify the best opportunity (Yil-Renko, Autio and Sapienza, 2001). However, Burt (1997) argues that strong personal ties among directors can hinder creativity and thus have negative effect on firms' strategies and financial performance. In a later study, Musteen, Francis and Datta (2010) show that information obtained from director's personal ties may be inferior in quality to that obtained

from professional networks. In addition, Adobor (2006) argues that personal network can sometimes be in conflict with the best interest of the firms. So, based on the contradictory literature related to personal network, we predict the following hypothesis in relation to CSR:

Hypothesis 2: Director's personal networks are negatively related to CSR

Network centrality and CSR

Centrality² measure is widely used in literature to measure the director's link in the network which captures director's ability to obtain information, command others and influences economic decision-making (El-Khatib, Fogel and Jandik, 2015). These networks are formed when they are (1) linked to more stakeholders; (2) close to all other stakeholders including peers, and; (3) on the shortest path connecting any other pairs of stakeholders.

It is proven that the connections among directors are kind of networks that cannot be ignored (Conyon and Muldoon, 2006; Engelberg, Gao and Parsons, 2012; Fracassi and Tate, 2012; Chen, Wang and Lin, 2014). The behaviour of directors towards CSR not only relies on their contacts, but they also get influenced by other directors in their network connections. There is an impressive body of existing literature examining the influence of director's networks and financial outcomes. Some studies find that connections among directors affect a wide variety of business activities (Liu, 2014).

Directors' personal and professional networks include all the directors whom directors have direct connections. These connections are significant because it is the main path transferring knowledge or information through these connections (Eberhard and Craig, 2013).

² Three common measures of centrality are: closeness, degree and betweenness centrality (Freeman, 1977). Closeness is the inverse of the sum of the (shortest) distances between a director and all other directors in a network; it indicates how efficient directors are in a network (El-Khatib, Fogel and Jandik, 2015). Degree is the number of direct ties director have in the network, the more connections directors hold, the more central this director is in the network (Khatib, Fogel and Jandik, 2015). Betweenness measures how often directors lie on the shortest path between any other two members of the network (Khatib, Fogel and Jandik, 2015).

Their personal qualities such as education and work experience affect their actions while deciding about CSR (Jacobson, Hood and Van Buren, 2014). While we measure the impact of director's personal and professional network, we also measure positional networks which provide a clear understanding of directors are in strategic network positions, giving them the power to spread CSR information through their extensive networks with their peers. Previous studies show that directors with high centrality (well-connected) can possess many advantages in their network, relative to low centrality (less-connected) directors (Faleye, Kovacs and Venkateswaran, 2014). The concept of well-connectedness involves many dimensions. Firstly, a director may be well-connected if they possess many channels of resource exchange, giving them opportunities to share and receives information faster than other directors (measured by DEGREE centrality). Secondly, a director may be well-connected if it possesses closer ties to other directors i.e. there are fewer steps between other directors, making resource exchange quicker (measured by CLOSENESS centrality). Lastly, a director may be well-connected if it lies on more paths between pairs of other directors, making a key broker of resource exchange (measured by BETWEENNESS centrality). Directors with large centrality can have better access to valuable information about their firms and peer firms (Larcker, So and Wang, 2013). This valuable information can help these directors to make better decisions while deciding CSR policies, leading to better CSR. Therefore, we propose our third hypothesis that director's centrality has a positive impact on CSR:

Hypothesis 3: Director's network centrality is positively related to CSR

3. Methods

3.1. Sample

To test our hypotheses, we follow multi-stage data collection procedure using the listed firms available from BoardEx and then merge with the CSR data from ASSET4 database. Finally, we collect financial data from DataStream for the merged firms. In this section we discuss our sample selection in detail.

The data for director's characteristics information are extracted from BoardEx. For each fiscal year during the sample period, we collect demographic information on each of the firm's director, including inside and outside directorships they are holding. We also collect their current place of employment with their job title and all the board, where they sit. Finally, we find their educational history, including the institution attended, the year they graduated, and degree earned.

Information on networks ties is often missing or incomplete because BoardEx does not cover all the relevant directors. To avoid reducing the sample size, we do not drop the missing observations. Instead, when information on some network ties is often missing or incomplete, we assume there is no tie (Khanna, Kim and Lu, 2015). We intend to select the whole universe of firms reported by BoardEx. However, when we merge our final sample, firms with no CSR information reported were dropped immediately. Therefore, after deleting all financial firms, our final sample consists of unbalanced panel 9468 firm-year observations. In particular, this sample consists of 785 firms with 839 unique directors in 28 countries during the period of 2003-2016.

We draw CSR data from Thomson Reuters's ASSET4 database. ASSET4 is an established source for environmental, social and governance (hereafter ESG) information used by many

researchers to measure CSR (Cheng, Ioannou and Serafeim, 2014). ASSET4 collect data and score for firms on ESG dimensions since fiscal year 2002. ASSET4 database has a team of 125 analysts to collect information on over 900 evaluation points per firm and according to their guidelines, all the primary data used must be objective and publicly available. Then these data points are combined into 226 key performance indicators (KPIs), which make the basis of the rating process of firm's three performance pillars: environmental, social and governance. ASSET4 then transform this information into ratings through a system that assigns weights of each key performance indicators following several industry considerations. To form a firm's rating pillar, ASSET4 add up the products of each key performance indicators and its weight for each pillar. These scores are adjusted for skewness and fitted to a curve to derive ratings between 0 and 100.

3.2. Variable Description

Following previous literature, Kim, Kim and Qian, (2015); Pisani *et al.*, (2017), we capture CSR by measuring environment and social score of the firm.

Environment Score (ES): The first key pillar environmental scores measures as how well a company uses the best management to generate long-term shareholders value (Cheng, Ioannou and Serafeim, 2014). We measure ES using ASSET4 environment pillar, which measures how a firm uses their practices to generate long-term shareholder value by measure the impact on living and non-living natural systems. ES is based on three categories: resource reduction, emission reduction, and product innovation, ASSET4 assign a value from 0 to 100, with higher values shows better ES.

Social Score (SS): The second pillar social score shows firm's capacity to generate trust and loyalty with its workforce, customers, and society, through its use of best management practices and firm's reputation and the health of its license to operate (Cheng, Ioannou and

Serafeim, 2014). We measure SS using the ASSET4 social pillar, which measures how firm generates trust and loyalty amongst its stakeholders. SS is based on seven categories including employment quality, health and safety issues, training, diversity, human rights, community involvement, and product responsibility. The variable takes the values from 0 to 100, with higher value shows higher SS levels.

Director's personal and professional networks

We use our fundamental data from BoardEx to measure network connections between directors of the firms. For this study, we consider six types of measures to operationalize director's network connections. The professional network consists of current employment, and independent directors, the personal network includes education networks and the centrality includes closeness, degree and betweenness.

Professional Networks

Following (Fracassi and Tate, 2012), we use our first measure of directors' network (*Professional Network 1*) by using the current employment of directors. When two or more directors work in the same firm and sit together on the same board, they are connected through their current employment network. Following (Dikolli, Mayew and Nanda, 2014), we use our second measure of directors' network (*Professional Network 2*) by calculating the number of *independent directors in a firm*. Three or more outside directors are connected if they sit on the same board as independent directors.

Personal Networks

Prior studies suggest that two directors are connected if they went to the same school and graduated within two years of each other with a similar degree (Faleye, Kovacs and

Venkateswaran, 2014). We operationalize the directors' *Personal Network* by calculating natural logarithm of number of directors who share same school for similar degree.

*Director's centrality networks*³

We use common measures of centrality from the network literature to evaluate the position of a director in the network (El-Khatib, Fogel and Jandik, 2015). Closeness: closeness measures the number of steps that a director needs to take within their network to reach any other director. This measure captures the connection to highly influential directors. Closeness is defined as the inverse of the average distance between as director and any other directors. Letting $l(i, j)$ be the number of steps in the shortest path between director i and director j ,

$$Closeness_i \equiv \frac{n-1}{\sum_{j \neq i} l(i, j)}$$

Degree: Degree measures all the direct links that each director has with other directors in the network. This measure takes the most information in an account to which a director is visible because it measures the fraction of directors to which the director is connected. Let $\delta(i, j)$ denotes an indicator that directors i and j share a network,

$$Degree_i \equiv \sum_{j \neq i} \delta(i, j)$$

Betweenness: Betweenness measure the shortest paths linking two directors in the network that pass through a director. This measure is most effective capturing the absolute position of a director in the network. Let $P_i(k, j)$ denote the total number of shortest paths between

³ Director's historic employment can help them to form network. We argue that our centrality measurement can capture this fact. The information regarding historic employment information includes their firms in which they worked; their roles, role descriptions, and years of employment.

director's k and director j, and $P(k, j)$ denote the total number of shortest paths between k and j,

$$Betweenness_i \equiv \sum_{j \neq i: i \in \{k, j\}} \frac{P_i(k, j)/P(k, j)}{(n-1)(n-2)/2}$$

Firm-specific and country control variables

We include several firm-specific control variables that may affect CSR in those firms. At the firm level we control for firm size, profitability, leverage, liquidity and Tobin's Q. Firm size is natural logarithm of total assets (Villiers, Naiker and van Staden, 2011; Cheng, Ioannou and Serafeim, 2014). Profitability measured by ROE; net income divided by book value off equity, Leverage; dividing total debt by percentage of common equity (Walls, Berrone and Phan, 2012). Liquidity; net sales divided by the receivable net. We use a sum of equity market value and liabilities market value divided by equity book value plus liabilities book value to proxy for Tobin's Q (Khanna, Kim and Lu, 2015) . We employ GDP per capita and inflation to control for country control variables.

Finally, we measure two firm-level governance measures constructed using data from ASSET4. An impressive set of papers considers alternative measures of corporate governance and study the impact of these governance measures on firm performance (Bhagat and Bolton, 2008). Gompers, Ishii and Metrick, (2003), (hereafter GIM) governance measure is an equally weighted index of 24 governance provisions, such as, presence of staggered board, the existence of poison pills, dual-class shares, whether firm has limits to calling special meeting, blank cheque, classified board, compensation plan, voting rights, golden parachute, liability, shareholders right, supermajority, fair price provision, secret ballot and written consent. G-index ranges between 0 and 24, where higher values indicate weaker shareholder rights. Some of the researchers such as (Bebchuk, Cohen and Ferrell, 2004; Bebchuk, Cohen

and Ferrell, 2008) found some of the provisions matter more than others; therefore they create an "entrenchment index". The entrenchment index (E-index) consists of six shareholders rights provisions in a firm's charter (Bebchuk, Cohen and Ferrell, 2004; Bebchuk, Cohen and Ferrell, 2008). These provisions are calculated as one point for each of the following six charter provision that a firm has: staggered board, a supermajority, golden parachute, the existence of poison pills (Bebchuk, Cremers and Peyer, 2011). E-index ranges between 0 and 6, where higher values indicate weaker shareholder rights, similarly to G-index.

3.3. Econometric Approach

As we have repeated measurements at firm level CSR scores (environmental and social) that are nested within countries, a multilevel (panel) data regression analysis is suitable for the test of our hypotheses. Multilevel analysis is a method to include explanatory variables at different levels simultaneously such as country and firm level (Dong and Stettler, 2011; Braam et al., 2015). A major problem of this model is the possibility of firm-level unobserved heterogeneity, which can be solved by firm-level fixed effects model. We use Equation 1 to examine the hypotheses empirically.

$$CSR = \beta_0 + \beta_1 DIRECTOR'S NETWORK + \beta_2 CENTRALITY + \beta_3 FIRM_{CONTROL} + \beta_4 COUNTRY_{CONTROL} + \varepsilon \dots \dots \dots Eq 1$$

Where Environment Score (ES) and Social Score (SS) are the measures for CSR, which are the dependent variables in the above equation. We use director's professional networks, personal networks and network centrality as our main explanatory variables to test the hypotheses. In addition, we control for firm-level variables as well as country-level variables which are explained in detail.

However, Nickell, (1981) argues that the estimated coefficients by firm-fixed effect model can be biased for a short panel length (our sample period is from 2003 to 2016). Furthermore, we use few time-invariant country-level variables across firms that makes fixed-effects models unusable. Recent studies show that firm performance related to CSR and corporate governance are simultaneously determined (Harjoto and Jo, 2011). In fact, the relationship between CSR and director's strategic decision are endogenous in nature (McCarthy, Oliver and Song, 2017). To solve this problem, we use two-step system Generalized Method of Moments (GMM)⁴ developed by Arellano and Bond, (1991) by including internal instruments with multiple lags of all exogenous explanatory variables (Wintoki, Linck and Netter, 2012). Our findings are explained below.

3.4. Descriptive statistics

Table 1 presents the number of firms we have for each country. It can be noted that Australia (131 firms) and USA (187 firms) have a very large number of firms compared to other countries. Surprisingly, China (3 firms), Austria (1 firm), and the Czech Republic (2 firms) have only a few firms in our sample, the reason for this could be after we merged our data from BoardEx and Asset4, firms with missing observations dropped out. We control for outliers by removing countries (Australia and USA) with most observations in our robustness section after merging our data. Figure 1. Shows the distribution of environment and social scores over the sample period. About 80 firms have obtained 10 score for environment, about 55 firms have received 90 score for investing in environment. For social score, higher (55 firms) number of firms received 90 score for investing in social and lowest (13 firms) firms received 10 score. Figure 2. Represents the mean from 2003-2016, showing firms are more interested to invest in social activities. However, the environment and social score have

⁴ We use Windmeijer, (2005) finite sample correction to the estimated standard errors.

increased from 2003-2016, proving more firms are aware of investing in activities related to CSR.

[Insert Table 1 about here]

[Insert Figure 1 and 2 about here]

Table 2 gives the break-up of industries covered in the sample. Table 2 shows the industrial classification including manufacturing industries such as chemicals, electronic and electrical industry, aerospace and defence. Table 2 shows the industry with most firms where the percentage is 4.5 or above, for instance, Construction and building materials (44 firms), Transport (43firms), and electronic and electrical equipment (41 firms) have the majority of the firms. Alternately, Investment companies (1 firm), Legal (1 firm), and containers and packaging (2 firms) have the least firms in our sample data.

[Insert Table 2 about here]

Table 3 presents the descriptive statistic for dependent, independent, country and firm-level control variables used in the analysis. The table shows that our sample firms are fairly large, with the mean of total assets \$15.9 million.

Table 3 shows the average of at least two directors attended the same institution in the same year and attained the similar type of degree. Our results are consistent with Faleye,

Kovacs, and Venkateswaran (2014), but as their study was only done for the U.S and our study is on cross country, we, therefore, have less mean values in our results.

Table 4 reports the correlations between all variables in the main tests. The correlations between personal network and ES (-0.08), and SS (-0.05) are as expected. The environment score and social score (0.76) are very high raising concern of multicollinearity. Thus, we calculate the VIF (variable inflation factor) for these variables and the highest VIF value is 3.35, which is well below the suggested limit of 10.

[Insert Table 3 about here]

[Insert Table 4 about here]

4. Results

The results from two-step system GMM are reported and discussed in this section. In this model, apart from lags of internal explanatory variables, following Mak and Li, (2001) we also include the variable number of inside directors. Based on Hansen test statistics, we find 2 years lag the optimal lag length of our GMM model. The joint significance of the independent variables is confirmed by high F-statistics. Furthermore, the insignificant Hansen test (reported p-value) indicates that our models do not suffer from over-identification. The use of a dynamic panel (lagged dependent variable) is further supported by significant AR (1) and not-significant AR (2). Additionally, we also check the multicollinearity of variables and find the VIF of the variables used in our models are below 10.

4.1 Director's professional network and CSR

Our main results for Hypotheses 1 are presented in Table 5. Hypothesis 1 predicts a positive relationship between director's professional networks and CSR. Columns 1 and 4, we show the base model, in which exogenous control variables are regressed on ES and SS

(the two measures of CSR). In Columns 2 and 4, we include along with the other variables (as Column 1 and 2) and regress the two professional network measures on ES and SS. As it can be seen that, the coefficient for Professional Network 1 is positive and statistically significant ($\beta = 7.394$, $p < 0.05$) in Column 4 and the coefficient for Professional Network 2 is also positive and statistically significant ($\beta = 16.237$, $p < 0.10$) in Column 2. This implies, on average an increase of one more participant in the director's Professional Network 1 and 2, the CSR score will increase by 16.24 and 7.40 unit for ES and SS respectively. This indicates that directors use their professional network 1 (formed through their current employment) for society and professional network 2 (formed through shared board of director's position) for environment. Overall, these results support the Hypothesis 1.

[Insert Table 5 about here]

4.2 Director's personal networks and CSR

Hypothesis 2 predicts a negative relationship between director's personal networks and CSR. Our findings for this hypothesis are documented in Columns 3 and 5 of Table 5. In these two columns, we regress personal network variable on ES and SS. Note that, since the directors are employed to their firms, so their professional networks are still in use in addition to personal network in Columns 3 and 5. The coefficient on directors' personal network and ES is negative and statistically significant (Table 5 Column 3: $\beta = -2.660$, $p < 0.001$). This indicates that increase of participants in director's personal network reduces the environment score of the firms. However, we do not find statistically significant coefficient for personal network when we regress on SS. This may be because directors can easily get influenced by their personal network to invest in profit-making projects rather than in CSR. This supports our Hypothesis 2.

4.3 Director's networks centrality and CSR

In Table 6, we investigate the effect of director's network centrality on CSR, namely ES and SS. To find empirical support for Hypothesis 3, we include three measures of centrality – degree, betweenness and closeness in stepwise i.e. each centrality measures at a time in our dynamic regression models. The coefficient on degree of centrality in Column 1 is positive (although small) and statistically significant ($\beta = 0.003$, $p < 0.10$) and the coefficient on betweenness centrality in Column 2 is also positive and statistically significant ($\beta = 79.934$, $p < 0.10$). This indicates that the centrality position of directors get support and access important information to engage in CSR related to environment. However, we do not get support for centrality measures related to closeness centrality and ES. When we regress degree, betweenness and closeness centrality measures on social score, we do not observe any statistically significant coefficients. The reason can be, the centrality in director's network where the directors form direct links with other directors (of different firms in similar or dissimilar firms) is used to improve the image of the firms through taking care of environments. However, a number of prior studies shows that the network centrality is mainly used to improve firms innovation (e.g. Guan and Liu, 2016; Leanders and Dolfmsa, 2016; Perry-Smith and Manucci 2017, Chuluun et al. 2017, etc.). So we believe that directors access knowledge through their centrality position in a network about their competitors regarding innovation and spend their earnings in profit-generating projects. So, their spending on CSR that improves their social score gets neglected. So, our results partially support Hypothesis 3.

[Insert Table 6 about here]

4.4 Further investigations

Director network and CSR activities during financial crisis

The global financial crisis led to a worldwide rethinking of their financial system's architecture (Affinito and Pozzolo, 2017). Achieving financial stability and developing a well-functioning market have become the most essential to firms after the financial crisis (Lins, Servaes, and Tamayo, 2017). Prior studies examine the relationship between firm's environment and social behaviour and their financial performance during the recent financial crisis (e.g. Cornett, Erhemjants, and Tehranian, 2016). Having access to social capital recourses, it is possible to reduce the negative impact of stressful events, such as financial crisis. Directors often seek to take support from their networks when they seek to handle economic hardship (Heemskerk, 2013). Based on previous literature discussed above, it is evident that interpersonal links likely to affect director's CSR decision during financial distress. Although, Cornett, Erhemjants, and Tehranian, (2016) documents that CSR activities are limited during the financial crisis, but prior studies lack empirical evidence of the effect of financial crisis on the relationship between different types of directors' network and their CSR activities. Since our sample period covers the recent global financial crisis, in our next attempt we aim to understand which type of CSR activities (environment or social) is worst affected by the financial crisis when directors are in a network.

[Insert Tables 7a and 7b about here]

We find that during the financial crisis, while director's professional and personal networks do not have any significant impact on firm's environment score, their network centrality, in particular the closeness centrality increases the environment score of the firms (Table 7a, Column 4). For instance, the closeness centrality increases the Environmental score during the crisis i.e. increasing the closeness centrality during the financial crisis can increase CSR activities by about 6% in terms of environmental score (from $\beta = 17.872$, $p <$

0.10 to $\beta = 23.141$, $p < 0.01$). However, Column 4 of Table 7b shows that the increase of closeness centrality can decrease the CSR activities indicated by social score by 17% (from $\beta = 30.983$, $p < 0.01$ to $\beta = 14.181$, $p < 0.05$). So overall, the CSR activities decrease during the financial crisis, because firms and, in particular, directors try to spend more earnings carefully in increasing profit margins than CSR by product differentiation, innovation, or improving strategic and management decisions.

5. Robustness checks

This study has conducted a number of post ad hoc tests. Firstly, Table 2 shows that industries such as construction and building materials, electronic and electrical equipment, leisure and hotel, mining, and transport have more firms compared to other industries. So, we dropped the firms of these industries and estimate the model again. The results are reported in Table 8a and 8b. Secondly, by dropping firms from Australia and United States (relatively large number firms belong to these two countries), we test the model and lastly, we estimate the model by dropping observations from year 2008-2010 (not reported). In all these situations, our results stay qualitatively similar, providing support for our predictions.

[Insert Table 8a and 8b about here]

5.1. Conclusion

CSR has become a key strategic decision for the board of directors as it has obtained importance from society and stakeholders that are close to the firm, especially regarding environmental and social issues. A capable director should not only focus on company's policies but also motivate others to contribute to activities related CSR. A well-networked director provides and receives valuable information quickly and cost-effectively. Several studies examine the effect of director's networks on firm's outcomes. Most of the empirical

studies focus on firm's financial performance and CSR, to our knowledge, no study has examined the impact of different type director's network on CSR performance. This paper develops and tests the hypothesis that directors through their professional networks have a positive impact on CSR, whereas director's personal networks have a negative impact on CSR, showing peers likely to advise more on issues related to strategic decision making.

In this paper, we examine the impact of director's networks on CSR in developed and developing countries. It seems that director's networks play an essential role for the enhancement of the environment and social performance of the firm, which means that directors of firms must pay attention to their stakeholder's relationships that influence their behaviour. Especially, those from less developed countries should make efforts to build their relations with their peers and convince them to see the importance of CSR in their firms and support them for the strategic decision-making process of CSR. Our study finds that director's professional networks have a significant and positive impact on CSR. However, director's personal networks have a negative impact on CSR. Moreover, our study draws attention to the impact of director's networks during times of distress as well.

We consider environment score (ES) and social score (SS) separately to find the impact of director's network on CSR in depth. Moreover, we find from our analysis that director's networks affect environment scores (ES) more than social scores (SS). Previous literature findings have shown that director's network effect firm performance, also CSR effect firm performance (Larcker, So and Wang, 2013; Benabou and Tirole, 2010). However, the lack of evidence of the impact of director's network on CSR motivated us to extend the existing literature. In addition, we included the period of financial crisis in our study to examine how the directors' networks during financial crisis impact the CSR performance of firms in different countries. Empirically we find evidence that director's personal and professional network has a better impact on CSR and that director's centrality also affects CSR positively.

Even though we did not hypothesize a relationship between director's network and CSR before and after the crisis, in series of further investigation, we find that there is a significant relationship between director's network and CSR during the crisis. This significant relation demonstrates the networks continue to play an important role in developing and developed countries even in the financial crisis period. We find that directors that are more central in the network are more likely to pursue growth in the environment and social performance.

Directors represent the most important shareholders, they know the behaviour and performance of the firm better, directors have an interest in increasing CSR related expenditure because of their interest of stakeholders and their identity which is affiliated strongly with the firm (Renneboog and Zhao, 2014). CSR has become crucial for firms due to the importance that it has acquired both in the society and among stakeholder's groups closest to the firm especially concerning the environment and social performance.

The contribution of this study has several main aspects. Academically, we contribute to the literature of director's personal and professional networks by demonstrating the effects of director's networking and interaction on CSR. We address the role of each director's network (formal/informal) in each aspect of CSR (environment/social). Our results extend the existing literature on the benefits of networks and centrality and show that director's network connections matters in corporate governance. Our results suggest that directors add value to the board not only with qualification or previous experience but also with network connections they have. We also contribute to the literature on the financial crisis in developed and developing countries by demonstrating director's importance on networking during the crisis period.

Secondly, the managerial implications of this study relate to firms interested in improving CSR performance by having large networks of directors who can influence decisions

financially and non-financially. The analysis of this study adds value to directors because it points to a specific area related to CSR in corporate governance, as the pressure from other stakeholders may be directed to better firm performance, to deal with this, they can build up their network to take support from their peer directors. Our results also suggest that directors should engage in building and strengthening their networks, and they should utilise those networks to drive new ideas to improve CSR performance. Our findings also contribute to the financial sector suggesting the lenders (banks) reconsider their decisions while lending loan to the borrowers (directors) to directors with their large network as it is proven in the previous literature that banks are interested in firms who engage themselves in CSR activities (Nandy and Lodh, 2012). The managerial implications of this study also highlight the importance of networks in developed and developing countries, by demonstrating that directors with such networks have access to more significant and vital information, positioning themselves to pursue opportunities both industrial and country level that best matches their CSR performance.

Previous single theoretical models lead to contradictory findings which we overcome by bringing several theories together to explain the research question. Theoretically, our findings indicate that most of these directors' personal and professional networks are important in developed and developing countries to improve their financial performance. We extend Waldman, Siegel, and Javidan, (2006), existing theoretical model examining the relationship between types of director's network and CSR. Our study also provides theoretical implication by recognising inside and outside director's network and their impact on personal and professional networks. Figure 3. shows that directors working or worked together can network inside their firms and have an impact on professional networking. However, directors related outside the firm such as education and independent directors can network inside and outside the firm, have a high impact on professional and personal networking.

Finally, our study has important policy implications. CSR plays a vital role in the firm's strategic decision-making process in developed and developing countries (Wanderley et al., 2008), our study will be interest to policymakers because we identify types of director's networking that may deserve regulatory focus to achieve the CSR objectives.

Despite several relevant contributions, we are aware that our study has some limitations. We find that there is lack of extensive details about director's network, especially in developing countries. By looking at other characteristics of directors such as director's duality future research can examine the impact on CSR. As we only explained in robustness test the impact of the crisis on director's network and CSR, future research can extend this literature by finding how financial crisis influence networks and its impact on CSR in developed and developing countries. Finally, further research should consider the country level changes in corporate governance framework and its impact on CSR considering other types of networking such as social media networking and lobbying.

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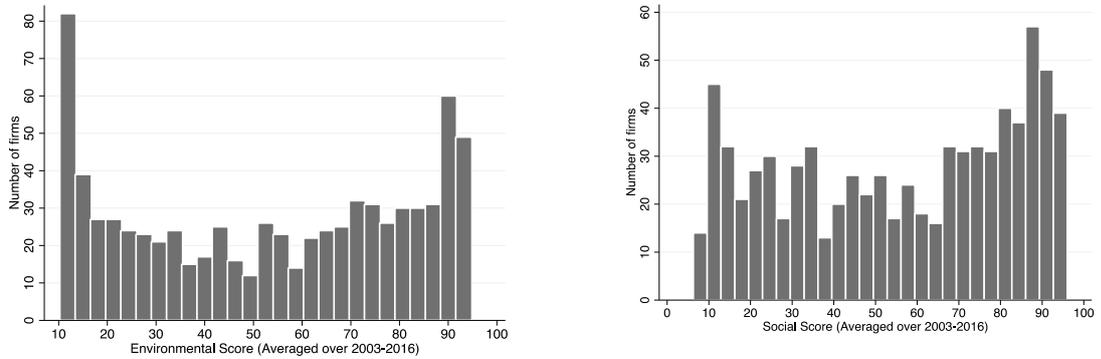


Figure 1: Distribution of Environmental and Social Scores for the sample firms (averaged over 2003-2016)

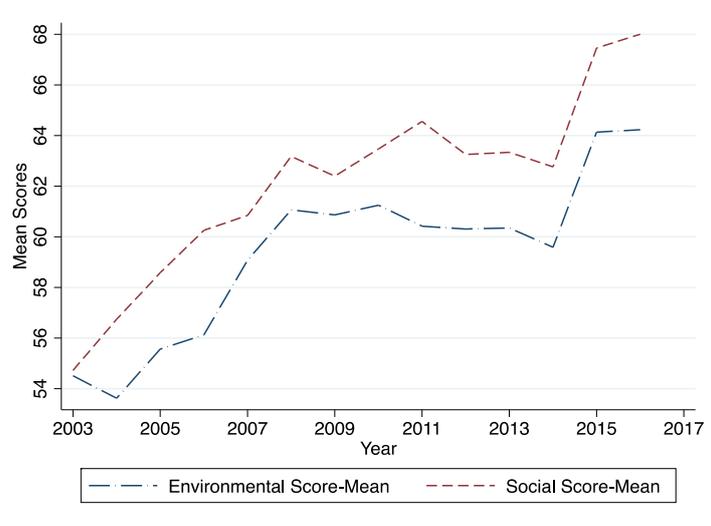


Figure 2: Distribution of CSR Scores (Environmental and Social) over 2003-2016

Figure 3.

	Professional	Personal
Inside Networking	<i>High/Low</i>	High/ <i>Low</i>
Outside Networking	<i>High/Low</i>	<i>High/Low</i>

Table 1: Number of Firms in each country

Country	Freq.	Percent
Australia	131	16.69
Austria	1	0.13
China	3	0.38
Czech Republic	2	0.25
Denmark	8	1.02
Finland	12	1.53
France	37	4.71
Germany	25	3.18
Greece	2	0.25
Hong Kong	18	2.29
India	63	8.03
Israel	2	0.25
Italy	12	1.53
Japan	56	7.13
Mexico	9	1.15
New Zealand	14	1.78
Norway	4	0.51
Philippines	12	1.53
Poland	3	0.38
Russian Federation	8	1.02
Singapore	10	1.27
South Africa	49	6.24
Spain	12	1.53
Sweden	4	0.51
Switzerland	8	1.02
Turkey	5	0.64
United Kingdom - England	88	11.21
United States	187	23.82
Total	785	100

Table 2: Number of firms in each industry (2003-2016)

Industry	Freq.	Percent
Aerospace & Defence	7	0.89
Automobiles & Parts	23	2.93
Beverages	8	1.02
Business Services	35	4.46
Chemicals	22	2.8
Clothing, Leisure and Personal Products	18	2.29
Construction & Building Materials	44	5.61
Consumer Services	4	0.51
Containers & Packaging	2	0.25
Diversified Industrials	30	3.82
Education	2	0.25
Electricity	22	2.8
Electronic & Electrical Equipment	41	5.22
Engineering & Machinery	27	3.44
Food & Drug Retailers	9	1.15
Food Producers & Processors	29	3.69
Forestry & Paper	4	0.51
General Retailers	32	4.08
Health	19	2.42
Household Products	7	0.89
Information Technology Hardware	14	1.78
Investment Companies	1	0.13
Legal	1	0.13
Leisure & Hotels	36	4.59
Media & Entertainment	32	4.08
Mining	40	5.1
Oil & Gas	37	4.71
Pharmaceuticals and Biotechnology	39	4.97
Publishing	5	0.64
Real Estate	18	2.29
Renewable Energy	6	0.76
Software & Computer Services	38	4.84
Steel & Other Metals	25	3.18
Telecommunication Services	36	4.59
Tobacco	5	0.64
Transport	43	5.48
Utilities - Other	20	2.55
Wholesale Trade	4	0.51
Total	785	100

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Director's Network</i>					
Personal Network	9134	1.323	1.509	0	4.543
Professional Network 1	9468	0.247	0.489	0	2.565
Professional Network 2	6309	0.707	0.142	0.500	1
Degree Centrality	9468	150.593	317.036	1	2884.000
Closeness Centrality	9468	0.163	0.116	0	0.355
Betweenness Centrality	9468	0.035	0.103	0	0.446
<i>Corporate Social Responsibility</i>					
Environmental Score (ES)	6436	60.337	30.339	8.570	97.460
Social Score (SS)	6436	63.274	28.876	3.590	98.930
<i>Control Variables</i>					
G-index	9468	2.534	2.475	0	12
E-index	9468	0.875	1.009	0	5
Log (Total Assets)	8881	15.950	2.485	3.219	23.758
Tobin's Q	8587	2.016	2.659	0.278	173.639
ROE	7999	14.400	154.588	-2690.260	10400
Log (Liquidity)	8599	3.965	0.843	0	10.026
Debt-Equity Ratio	8935	104.858	2113.343	-81371.850	127028.900
Board Size	6784	11.014	4.082	2.000	30
CG Score	6436	58.587	27.869	1.240	97.590
GDP	9468	3.057	3.051	-9.180	15.510
Inflation	9468	2.840	2.605	-2.670	25.300

Table 4: Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1 Personal Network	1.00																			
2 Professional Network 1	0.08	1.00																		
3 Professional Network 2	0.09	0.19	1.00																	
4 Degree	-0.01	0.09	0.02	1.00																
5 Closeness	-0.31	0.07	-0.03	0.32	1.00															
6 Betweenness	0.43	-0.09	0.00	0.12	-0.50	1.00														
7 ES	-0.08	-0.17	-0.09	-0.01	0.07	-0.01	1.00													
8 SS	-0.05	-0.17	-0.12	0.00	0.01	0.13	0.76	1.00												
9 G-index	-0.09	0.04	0.09	0.07	0.22	-0.18	0.15	0.14	1.00											
10 E-index	-0.04	0.05	-0.02	0.07	0.15	-0.07	0.11	0.12	0.69	1.00										
11 Log (Total Assets)	-0.01	-0.22	-0.26	-0.05	-0.01	0.09	0.39	0.37	-0.01	0.03	1.00									
12 Tobin's Q	-0.02	-0.04	-0.04	-0.04	0.02	-0.04	-0.12	-0.06	-0.06	-0.04	-0.02	1.00								
13 ROE	-0.05	-0.07	-0.04	0.00	0.00	0.02	0.04	0.08	-0.02	-0.01	0.07	0.19	1.00							
14 Log (Liquidity)	0.01	-0.08	0.03	-0.07	0.01	-0.09	-0.04	-0.09	-0.06	-0.04	0.01	-0.08	-0.06	1.00						
15 Debt-Equity Ratio	0.00	-0.02	-0.03	0.01	0.02	0.00	0.06	0.02	0.00	0.02	0.05	-0.06	0.00	0.04	1.00					
16 Board Size	0.01	-0.23	-0.28	0.03	-0.01	0.19	0.35	0.43	0.07	0.10	0.49	-0.06	0.02	0.05	0.06	1.00				
17 CG Score	0.02	0.14	0.19	0.10	0.08	0.05	0.28	0.34	0.30	0.23	-0.20	-0.12	-0.03	-0.13	0.01	-0.03	1.00			
18 GDP	0.01	0.03	-0.11	-0.03	0.01	-0.05	-0.14	-0.13	-0.14	-0.07	0.23	0.23	0.04	0.02	-0.04	0.05	-0.20	1.00		
19 Inflation	0.07	-0.07	-0.21	-0.04	-0.14	0.31	-0.08	-0.02	-0.21	-0.09	0.37	0.18	0.07	0.00	-0.01	0.20	-0.24	0.43	1.00	

Table 5: Dynamic GMM regression: Effect of personal and professional network on CSR

	Environmental Score (ES)			Social Score (SS)		
	(1)	(2)	(3)	(4)	(5)	(6)
ES _(t-1)	0.336*** (7.059)	0.281*** (6.376)	0.322*** (8.462)			
SS _(t-1)				0.471*** (11.146)	0.367*** (6.564)	0.453*** (11.288)
Industry average-ES	0.316 (1.200)	0.069 (0.338)	0.100 (0.722)			
Industry average-SS				0.885*** (3.663)	1.105*** (4.995)	0.705*** (4.816)
G-index	-0.616 (-0.703)	0.701 (0.706)	0.495 (0.888)	-0.181 (-0.327)	-0.067 (-0.130)	0.362 (0.692)
E-index	-0.307 (-0.140)	-0.972 (-0.550)	-0.681 (-0.530)	2.901+ (1.940)	0.372 (0.228)	2.201+ (1.916)
Log (Total Assets)	2.556+ (1.709)	3.288** (2.728)	0.844 (1.312)	-0.918 (-0.637)	-0.692 (-0.524)	0.154 (0.181)
Tobin's Q	-6.489*** (-3.410)	-4.098** (-3.007)	-3.480** (-3.214)	-1.358 (-0.879)	-1.505 (-1.022)	-1.162 (-0.964)
ROE	-0.101 (-1.487)	-0.031 (-0.551)	-0.098* (-2.001)	-0.058 (-1.212)	-0.124+ (-1.931)	-0.020 (-0.493)
Log (Liquidity)	1.685* (2.033)	0.810 (1.120)	1.154+ (1.882)	1.405+ (1.728)	2.111** (2.763)	2.003*** (3.518)
Debt-Equity ratio	-0.000 (-1.132)	-0.000 (-0.889)	0.000 (0.183)	-0.002+ (-1.957)	-0.002* (-2.166)	-0.003* (-2.316)
Board size	-0.285 (-1.641)	0.132 (0.495)	-0.220 (-1.060)	-0.017 (-0.083)	-0.804** (-3.116)	-0.479* (-2.533)
CG Score	0.506*** (6.430)	0.298*** (3.999)	0.246*** (4.529)	0.556*** (6.797)	0.490*** (5.394)	0.335*** (5.866)
GDP	-0.152 (-0.963)	-0.103 (-0.646)	-0.116 (-0.809)	0.012 (0.080)	0.150 (0.784)	0.292* (2.000)
Inflation	-0.104 (-0.497)	0.118 (0.473)	-0.014 (-0.064)	-0.043 (-0.205)	-0.006 (-0.019)	0.228 (0.954)
Year dummies	YES	YES	YES	YES	YES	YES
Professional Network 1		2.262 (0.749)	4.504* (2.433)		7.394* (2.377)	3.778* (2.194)
Professional Network 2		16.237+ (1.712)	9.832 (1.319)		8.031 (0.658)	3.559 (0.441)
Personal Network			-2.660*** (-3.337)			-0.541 (-0.939)
Observations	2831	1678	1678	2831	1678	1678
AR(1) p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.589	0.630	0.168	0.677	0.515	0.388
Hansen Over-id (p-value)	0.871	0.299	0.524	0.278	0.442	0.313
F-statistics First Stage	59.03	41.10	59.85	51.83	30.79	47.41
p-value (F-stat)	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Two-step dynamic GMM is used. Industry effect is included in all the models. t-statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01 and + p<0.001.

Table 6: Dynamic GMM regression: Effect of directors' network centrality on CSR

	Environmental Score (ES)			Social Score (SS)		
	(1)	(2)	(3)	(4)	(5)	(6)
ES _(t-1)	0.107*** (7.928)	0.115*** (8.966)	0.095*** (6.277)			
SS _(t-1)				0.471*** (13.719)	0.461*** (13.579)	0.450*** (12.810)
Industry average -ES	0.725*** (10.643)	0.707*** (11.345)	0.912*** (12.036)			
Industry average -SS				0.621*** (5.111)	0.538*** (4.670)	0.669*** (5.334)
G-index	0.950*** (3.578)	0.969*** (3.856)	0.961*** (3.771)	-0.384 (-0.809)	-0.418 (-0.971)	0.107 (0.294)
E-index	0.420 (0.814)	-0.226 (-0.418)	-0.121 (-0.204)	2.935** (2.969)	2.103** (2.616)	2.156* (2.436)
Log (Total Assets)	2.560*** (7.279)	2.844*** (8.516)	2.852*** (8.496)	-0.514 (-0.745)	-0.295 (-0.449)	-0.755 (-1.086)
Tobin's Q	-5.261*** (-9.077)	-6.102*** (-9.097)	-4.817*** (-6.364)	-0.961 (-1.057)	-1.038 (-1.056)	-0.284 (-0.302)
ROE	-0.009 (-0.493)	-0.008 (-0.392)	-0.047* (-1.997)	-0.013 (-0.379)	0.018 (0.657)	-0.009 (-0.272)
Log (Liquidity)	0.240 (0.435)	0.480 (0.873)	0.706 (1.326)	2.400*** (5.243)	2.240*** (4.798)	1.982*** (4.235)
Debt-Equity ratio	-0.000* (-2.391)	-0.000* (-2.126)	-0.000* (-2.303)	-0.003** (-3.063)	-0.003* (-2.392)	-0.003* (-2.536)
Board Size	0.161 (1.384)	0.161 (1.256)	0.103 (0.777)	-0.415* (-2.201)	-0.201 (-1.085)	-0.309+ (-1.702)
CG score	0.446*** (19.315)	0.460*** (17.529)	0.466*** (13.204)	0.309*** (7.021)	0.298*** (6.986)	0.391*** (7.415)
GDP	-0.074 (-0.915)	-0.103 (-1.312)	-0.005 (-0.061)	0.352** (2.627)	0.319* (2.481)	0.304* (2.507)
Inflation	0.113 (0.746)	-0.139 (-0.940)	0.092 (0.646)	0.274 (1.261)	0.114 (0.567)	0.182 (0.851)
Year dummy	YES	YES	YES	YES	YES	YES
Professional Network 1	1.929*** (5.038)	2.548*** (6.626)	1.346** (3.299)	2.119+ (1.700)	2.583* (1.971)	1.231 (0.834)
Professional Network 2	12.621** (3.099)	14.355*** (3.648)	10.932* (2.420)	-2.998 (-0.396)	-2.380 (-0.378)	5.639 (0.792)
Personal Network	-0.675*** (-3.600)	-0.619*** (-3.670)	-1.114*** (-5.960)	0.161 (0.348)	0.455 (1.145)	0.072 (0.173)
Degree Centrality	0.003*** (5.403)			0.001 (0.684)		
Betweenness Centrality		79.934*** (4.825)			45.620 (0.663)	
Closeness Centrality			-1.155 (-0.236)			-2.772 (-0.217)
Observations	1678	1678	1678	1678	1678	1678
AR(1) p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.600	0.710	0.639	0.395	0.401	0.441
Hansen Over-id (p-value)	0.427	0.534	0.462	0.160	0.144	0.137
F-statistics First Stage	1134.02	829.07	1081.64	56.23	73.99	67.90
p-value (F-stat)	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Two-step dynamic GMM is used. Industry effect is included in all the models. t-statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01 and + p<0.001.

Table 7a: Dynamic GMM regression: Effect of Financial crisis on the relationship between director's network and CSR. The dependent variable is Environment Score.

	Environmental Score (ES)				
	(1)	(2)	(3)	(4)	(5)
ES (t-1)	0.138*** (5.829)	0.321*** (8.345)	0.105*** (7.868)	0.110*** (7.856)	0.111*** (8.170)
Industry average ES	1.024*** (5.222)	0.124 (0.857)	0.726*** (10.374)	0.733*** (11.237)	0.749*** (10.896)
Professional Network 1	1.644+ (1.655)	4.803* (2.465)	1.852*** (4.734)	2.340*** (5.229)	2.241*** (6.373)
Professional Network 2	17.014* (2.146)	10.827 (1.392)	13.001** (3.119)	11.072** (2.609)	10.930** (2.649)
Professional Network 1 x Crisis	0.805 (0.673)				
Professional network 2 x Crisis	1.937 (0.369)				
Personal Network		-2.588** (-3.017)			
Personal Network x Crisis		-0.408 (-0.394)			
Degree Centrality			0.002*** (3.624)		
Degree Centrality x Crisis			0.002** (2.664)		
Closeness Centrality				17.872* (2.098)	
Closeness Centrality x Crisis				23.141*** (3.665)	
Betweenness Centrality					160.065*** (6.790)
Betweenness Centrality x Crisis					-6.128 (-0.495)
Firm level control variables	YES	YES	YES	YES	YES
Country level control variables	YES	YES	YES	YES	YES
Observations	1678	1678	1678	1678	1678
AR(1) p-value	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.857	0.168	0.601	0.620	0.648
Hansen Over-id (p-value)	0.537	0.485	0.417	0.448	0.465
F-statistics First Stage	80.42	58.09	1099.49	927.87	1079.09
p-value (F-stat)	0.000	0.000	0.000	0.000	0.000

Notes: Two-step dynamic GMM is used. Industry effect is included in all the models. t-statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01 and + p<0.001.

Table 7b: Dynamic GMM regression: Effect of Financial crisis on the relationship between director's network and CSR. The dependent variable is Social Score.

	Social Score (SS)				
	(1)	(2)	(3)	(4)	(5)
SS (t-1)	0.062** (2.926)	0.049** (3.046)	0.502*** (14.875)	0.039*** (3.368)	0.503*** (15.201)
Industry average SS	0.797*** (5.739)	0.480*** (6.081)	0.189+ (1.888)	0.580*** (11.589)	0.201* (1.993)
Professional Network 1	0.882 (1.181)	1.230* (2.347)	0.198 (0.134)	1.192** (2.835)	0.811 (0.593)
Professional Network 2	11.171 (1.259)	5.451 (0.878)	-1.168 (-0.156)	8.934* (2.052)	-6.903 (-0.958)
Professional Network 1 x Crisis	0.715 (0.486)				
Professional network 2 x Crisis	-5.671 (-0.944)				
Personal Network		-1.158* (-2.577)			
Personal Network x Crisis		-2.216*** (-3.769)			
Degree Centrality			0.005* (2.224)		
Degree Centrality x Crisis			0.000 (0.328)		
Closeness Centrality				30.983*** (4.606)	
Closeness Centrality x Crisis				14.181** (2.838)	
Betweenness Centrality					146.332* (2.198)
Betweenness Centrality x Crisis					-22.087 (-1.438)
Firm level control variables	YES	YES	YES	YES	YES
Country level control variables	YES	YES	YES	YES	YES
Observations	1678	1678	1678	1678	1678
AR(1) p-value	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.522	0.418	0.178	0.530	0.200
Hansen Over-id (p-value)	0.426	0.329	0.304	0.099	0.323
F-statistics First Stage	13.32	22.56	32.07	96.61	32.18
p-value (F-stat)	0.000	0.000	0.000	0.000	0.000

Notes: Two-step dynamic GMM is used. Industry effect is included in all the models. t-statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01 and + p<0.001.

Table 8a: Robustness Test

	Environmental Score			
	(1)	(2)	(3)	(4)
ES (t-1)	0.301*** (5.204)	0.276*** (4.797)	0.271*** (4.628)	0.286*** (5.033)
Industry average ES	0.552* (2.493)	1.388*** (4.775)	0.910** (2.630)	1.165*** (3.754)
G-index	0.139 (0.133)	1.281 (0.991)	-0.607 (-0.488)	-0.079 (-0.120)
E-index	2.059 (1.370)	-0.692 (-0.323)	1.325 (0.431)	-1.540 (-0.746)
Log (Total Assets)	0.718 (0.664)	-1.572 (-0.741)	1.899 (0.889)	1.465 (0.711)
Tobin's Q	-3.031* (-2.306)	-3.122 (-1.401)	-6.892** (-3.058)	-3.562+ (-1.734)
ROE	0.092 (1.189)	-0.055 (-0.546)	-0.002 (-0.027)	0.006 (0.077)
Log (liquidity)	0.729 (0.730)	0.092 (0.083)	1.934+ (1.794)	0.531 (0.525)
Deb-equity ratio	-0.000 (-0.347)	-0.000 (-0.492)	-0.000 (-0.841)	-0.000 (-0.821)
Board size	-0.014 (-0.047)	-0.205 (-0.978)	-0.292 (-1.143)	-0.221 (-1.109)
CG Score	0.387*** (4.228)	0.566*** (5.546)	0.715*** (6.481)	0.594*** (6.657)
GDP	0.058 (0.394)	-0.086 (-0.462)	-0.021 (-0.102)	-0.068 (-0.359)
Inflation	0.300 (0.913)	0.028 (0.093)	-0.315 (-1.061)	-0.372 (-1.328)
Professional Network-1	7.802* (2.309)			
Professional Network 2	14.511 (1.547)			
Personal Network	-3.769** (-2.648)			
Degree Centrality		0.006+ (1.764)		
Closeness Centrality			64.016* (2.379)	
Betweenness Centrality				190.332 (1.293)
Observations	1206	2041	2041	2041
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.332	0.980	0.743	0.795
Hansen Over-id (p-value)	0.867	0.751	0.767	0.518
F-statistics First Stage	88.34	46.95	45.85	44.76
p-value (F-stat)	0.000	0.000	0.000	0.000

Notes: Two-step dynamic GMM is used. Industry effect is included in all the models. t-statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01 and + p<0.001.

Table 8b: Robustness Test

	Social Score			
	(1)	(2)	(3)	(4)
Social Score (t-1)	0.476*** (14.468)	0.580*** (14.269)	0.552*** (14.296)	0.566*** (13.935)
Industry average SS	0.403*** (5.055)	0.040 (0.244)	0.109 (0.685)	0.255+ (1.660)
G-index	0.243 (0.596)	-2.088 (-1.611)	-0.344 (-0.304)	-0.436 (-0.328)
E-index	1.126 (1.418)	2.293 (0.924)	-0.134 (-0.061)	-0.128 (-0.058)
Log (total Assets)	0.626 (0.948)	-2.714 (-1.588)	-1.329 (-0.853)	-0.203 (-0.121)
Tobin's Q	-0.668 (-0.819)	1.105 (0.810)	2.582+ (1.881)	2.463+ (1.759)
ROE	-0.004 (-0.150)	-0.046 (-0.900)	-0.025 (-0.565)	-0.036 (-0.669)
Log (liquidity)	1.910*** (3.990)	2.148* (2.462)	1.951* (2.427)	1.736* (2.029)
Debt-Equity ratio	-0.003* (-2.251)	-0.002* (-2.160)	-0.002+ (-1.689)	-0.002+ (-1.668)
Board Size	-0.525*** (-3.406)	0.027 (0.109)	-0.043 (-0.199)	0.156 (0.578)
CG score	0.326*** (8.454)	0.725*** (8.488)	0.698*** (8.447)	0.647*** (7.930)
GDP	0.293* (2.480)	-0.099 (-0.572)	-0.107 (-0.664)	-0.058 (-0.359)
Inflation	0.152 (0.784)	0.087 (0.387)	-0.022 (-0.101)	0.021 (0.095)
Professional network 1	4.164** (2.991)			
Professional network 2	5.452 (0.870)			
Personal Network	-2.456*** (-3.271)			
Degree Centrality		0.011* (2.375)		
Closeness Centrality			34.876+ (1.669)	
Betweenness Centrality				215.105 (1.383)
Observations	1678	2831	2831	2831
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.095	0.355	0.264	0.272
Hansen Over-id (p-value)	0.337	0.825	0.915	0.777
F-statistics First Stage	222.37	36.39	45.67	45.58
p-value (F-stat)	0.000	0.000	0.000	0.000

Notes: Two-step dynamic GMM is used. Industry effect is included in all the models. t-statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01 and + p<0.001.

Appendix 1. Variable Description

Variable	Definition	Source
Current Employment (Professional Network 1)	CE arises when two individuals working in the same firm in the same year	Boardex
Independent Directors (Professional Network 2)	When firm is having three or more outside directors	Boardex
Education (Personal Network)	Two individuals attended same institute, graduated within two years and awarded similar type of degree	Boardex
Network Centrality		
Degree	Number of directors connected to other directors	Boardex
Closeness	The inverse of the sum of geodesic distances from one directors to other scaled by total number of reachable directors in the network	Boardex
Betweenness	The probability that a specific director is on the geodesic path between any other two directors	Boardex
CSR measure		
Environment score	Measure company's impact on living and non-living natural systems	Asset4
Social Score	Measure company's capacity to generate trust and loyalty with its important stakeholders	Asset4
Control variables		
Return on Equity	Net income divided by book value on equity	DataStream
Log of Total Asset	Sum of total assets	DataStream
Leverage	Total debt by % of common equity	DataStream
Liquidity	Net sales by receivable net	DataStream
Tobin Q	Sum of equity market value and liabilities market value divided by equity book value plus liabilities book value	DataStream
Governance variables		
G-Index	Gompers, Ishii and Metrick index (2003): Defined as one point for each of the following six Charter provision that a firm has: presence of staggered board, the existence of poison pills, dual-class shares, whether firm has limits to calling special meeting, blank cheque, classified board, compensation plan, voting rights, golden parachute, liability, shareholders right,	Asset4

	super majority, fair price provision, secret ballot and written consent	
E-Index	Entrenchment Index as calculated in Bebchuk, Cremers, and Peyer (2007). Defined as one point for each of the following six Charter provision that a firm has: staggered board, super majority, golden parachute, the existence of poison pills	Asset4
Instrument Variables		
GDP per capita	Real GDP	DataStream
Inflation	CPI Inflation	DataStream
Board size	Total number of directors on board	Boardex
Inside directors	Number of inside directors on the board	Boardex