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CORPORATE GOVERNANCE, INSTITUTIONAL CHARACTERISTICS, AND DIRECTOR NETWORKS IN MALAYSIA

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ABSTRACT

This study explores the structural relationship of director networks among boards of directors in publicly listed companies in Malaysia using social network analysis (SNA) techniques at both the director and company levels. This paper examines whether company corporate governance practices and institutional characteristics are associated with company network size and pattern. SNA performed using UCINET and NetDraw software shows that the directors and company in the networking are moderately connected. This suggests that there is a small group of directors or companies that are well-connected and well-positioned to exercise power, control, and influence over the network. This study also reveals the interconnectedness of board members and companies. The regression results also identify a group of the most well-connected and well-positioned directors and companies in Malaysia's corporate governance environment. The results suggest that board size, board meeting, and duality are the corporate governance practices, which most influence company network size and pattern. The presence of a Bumiputera or politically-connected director is an institutional characteristic, which especially determines the network of a company.

Keywords: Board of directors, corporate governance, director network, institutional characteristics, social network analysis.

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INTRODUCTION

Director networks can be categorised as either social or professional. Networks established through academic background, specific interests such as sports, music or hobbies, or club memberships are examples of social networks. Meanwhile, professional networks are established through daily professional work or business life. Prior studies have shown that the economics and finance literature has begun to pay more attention to the influence of director networks on corporate decision making and monitoring.

In addition, social networks have been used in numerous studies of kinship structure, social mobility, science citations, contact among members of deviant groups, corporate power, international trade exploitation, class structure and many other areas (Burt, 1998; Flores-Yeffal & Zhang, 2012; Hoitash, 2010; Krishnan, Raman, Yang, & Yu, 2011; Scott, 1988). A study on corporate governance concerns for Petra-Perdana Berhad in 2010 is one example which demonstrates how director networks may impair company stakeholder interests if a necessary solution goes untaken (Bushon, 2010).

Differing from prior studies, this study explores the structural relationship among board of director networks in Malaysia, at both the director and company level. Then, this study attempt to determine whether there is an association between company internal governance, institutional characteristics and director's networks at company level. Commonly, the board of director composition in Malaysia publicly listed companies can be executive or nonexecutive, and independent or non-independent. However, the board must have majority of independent directors when the chairman of the board is not an independent director (Finance Committee on Corporate Governance, 2012).

RELATED LITERATURE

Prior studies shown that poor management decisions will be attributed, in part, to inadequate oversight by directors. This will damage prospects in the labour market for directors and managers (Carpenter & Westphal, 2001). Thus, the selection for competence directors is essential for companies in order to succeed. From here, board of director networks would influence how the company select and appoint their board members. Due to the financial crisis, scholars were challenged to establish causal inferences that the endogeneity of board of director's structure variables could determine various companies' outcome variables which could be determined through, among others, the unobservable board of director's characteristics (Dey & Liu, 2010).

Board of director networks is a vital aspect of board characteristics and call for further exploration. Companies with boards, which have strong social networks, tend to enhance company and shareholder value as well as individual director value (Horton, Millo, & Serafaim, 2012). It is understood that most of the time, directors choose not to perform studies or experiments, but prefer to rely on whatever information they have obtained through casual communication (Fracassi, 2012). A network between boards of directors from different companies may allow valuable information to flow through the network (Fracassi & Tate, 2012). It also increases value for shareholders. The positive aspects of board of director networks could also increase the sharing of market information best practices and information negotiation, while extending professional contacts (Larcker & Tayan, 2010).

Prior studies also have shown that board of director networks play a major role to provide an important source of information (Horton et al., 2012; Chenhall, Hall & Smith, 2010; Carpenter & Westphal, 2001). Eventually, this will support the company's strategic decisions and control direction (Durbach & Parker, 2009) and enhance the board's advising role (Stuart & Yim, 2010). In addition, effective networks also will lead to company efficacy. Board of director networks could be a medium for directors to learn the appropriate strategies for their companies through the sharing of experiences and knowledge from other companies (Horton et al., 2012; Chenhall et al., 2010; Durbach & Parker, 2009; Carpenter & Westphal, 2001). Furthermore, the information flows within the network are valuable information, as it is first-hand, up-to-date and timely (Carpenter & Westphal, 2001). This information will increase board effectiveness (Stuart & Yim, 2010).

As current business situations often involve a large fraction of board of directors on multiple boards (Stuart & Yim, 2010), this will influence the positioning of directors within the networks, as different boards will look into different networks (Horton et al., 2012). The selection of an appropriate director will provide indirect as well as direct strategic information or access to strategic resources (Carpenter & Westphal, 2001). The quality, costs, relevance and timeliness of information will be positively affected thus enhance the company's value (Horton et al., 2012).

Prior research and current practices show that the allocation of linked board of directors across companies is not random (Fracassi & Tate, 2012). Furthermore, the central part of corporate governance is the board of directors, specifically their networks (Pesämaa, Klaesson, & Haahti, 2011). Firms with powerful executive are likely to appoint more linked directors for reasons that are more pleasant and friendly from the perspective of shareholders. Horton et al.

(2012), shows that different board of directors will definitely will looking into different network positions due to the level of compensation offered. In addition, Kim and Lu (2011) found that CEOs might prefer someone with whom they are socially connected in order to strengthen the CEO connectedness.

Furthermore, there is a need to capture all possible avenues through which a director can obtain an information advantage, such as golf club memberships, religious activities, and political affiliations (Horton et al., 2012). Social networks consist of partially overlapping markets; therefore, no single board of directors is fully aware of the entire network (Horton et al., 2012). Having a strong social network for a local setting, in this study Malaysia, can be beneficial force for local companies (Pesämaa et al., 2011). Fracassi and Tate (2012) also found that the networks between team of management from different companies would increase shareholder value through the creation of conduits, which enable valuable information flows from one firm to another.

Social Network Theory

The social network approach originates from three schools of thought: sociology, anthropology and role theory (Tichy, Tushman, & Fombrun, 1979). From a sociology perspective, the approach emphasizes patterns of interaction and communications as the key to understanding social life (Simmel, 1971). As for anthropology, the integration of the Strauss, Malinowski and Frazer theories emphasizes the content of the relationships joining individuals, the conditions under which they would exits, and eventually the evolution of these bonds over time (Galaskiewicz & Wasserman, 1993). Finally, role theory refines the definition of organisation by Katz and Kahn in 1966 as a 'fish nets' of interrelated offices (Tichy et al., 1979). Thus implies the network concept but is limited to one-degree role sets, in which is an individual directly linked to a focal person. It also limited because of individual bias (Wasserman & Faust, 1994).

A social network is defined as any bounded set of connected social units (Streeter & Gillespie, 1993). This definition highlights three important characteristics of social networks. First, networks have boundaries. The second key element of the definition is "connectedness" in social networks. The third key aspect of this definition is the social unit. Scott (1988) describes a social network as a strange but surprisingly powerful image of social reality. Every individual is connected to one another by invisible bonds, which are knitted together into a crisscross mesh of networks. These networks can be considered analogous to fishing nets or a length of cloth made from intertwined fabrics. In the Malaysian business context, a social network may be defined as inter-company coordination that is characterised by organic of social systems (Abd. Hamid, 2011).

Social network theory suggests that the patterns and implications of relationships demonstrate specific behavioural principles and properties where the network theories require specification in terms of patterns of relations, characterising a group or social system as a whole (Galaskiewicz & Wasserman, 1993). The use of social network theory as a premise for predicting network behaviour, then, is expectedly lower than the application of such a methodology to analyse network structure and operations. To date, two prominent network properties have provided a framework for viewing network behaviour, and these properties provide the basis for articles invoking the use of social network theory (Schultz-Jones, 2009). Scott (1988) further simplified the social network concept as a set of points connected by lines. From this idea emerged the application of social network analysis to the mathematical theory of graphs, in the hope of discovering a formal model for the representation of network structure.

Nevertheless, the outcomes of a social network can be both positive and negative. The positive outcome consists of broad access to power, information and solidarity, which eventually lead to the achievement of companies' desired goals. However, negative outcomes include costliness, inward focus, as well as rivalry against one network to another (Chenhall et al., 2010). In addition, companies with strong group memberships as well as broad social network are likely to maintain their core cultural values and attracts others in assisting the operation processes (Chenhall et al., 2010). Furthermore, resources and advantages can be acquired only through individual networks and networks between individuals, rather than firm-level networks (Smith, 2009).

DATA AND METHODOLOGY

Sample and Data

The data on director's profiles was obtained from annual reports downloaded from Bursa Malaysia Berhad official website (Bursa Malaysia Berhad, 2012). The sample consists of boards of directors for publicly listed companies in 2011. Table 1 describe the samples.

Table 1 and Table 2 summarise the demographic profile of the sample. The final sample observed was 745 publicly listed companies. Companies categorised under industrial product and trading and services sector contribute more than 50% from the total sample. It is important to mention that companies listed under financial sector were excluded because it has a very rigid set of rules and regulations.

Table 1
Derivation of sample

	Total
Number of companies listed as at 31st December 2011	822
Less:	36
Company listed under Financial Sector	
Company with PN17 status	16
Companies with incomplete data (unavailable 2011 annual report)	23
Outliers	2
Final Sample	745

Table 2
Industries classifications

Sector	No.	%
Constructions	40	5.37
Consumer products	125	16.78
Hotel	4	0.54
Industrial products	237	31.81
Infrastructure	6	0.81
Mining	1	0.13
Plantations	41	5.50
Properties	90	12.08
Technology	27	3.62
Trading & Services	174	23.22
Total	745	100.00

The information provided in annual reports includes the name of directors, age, types of directorships, citizenship, academic and industrial background and professional affiliations. In some cases, the annual report also includes biographical information of directors, such as family members who are also board members in the same company. Shared directorates may form an undirected boardroom network. Shared directorates is defined as two companies are linked if they shared at least one director as board member, vice versa (Larcker, So & Wang, 2013).

Director Network

The study focuses on social network analysis at both director and company level. The analysis used UCINET version 6.532, a social network analysis tool developed by Borgatti, Everett and Freeman (2002). To examine the relationship between internal governance, institutional characteristics and director's networks, this study employs the following ordinary least squares (OLS) model:

$$\begin{aligned} NETWORK = {} & b_0 + b_1 BSIZE_i + b_2 BMEET_i + b_3 DUALITY_{i,} + b_4 BIND_i \\ & + b_6 ACIND_i + b_6 INSTINV_i + b_7 AUDQ_i + b_8 ETHNICITY_i \\ & + b_9 POLCON_i + b_{10} FAMFIRMS_i + b_{11} FIRMSIZE_i \\ & + b_{12} LEVERAGE_i + b_{13} INDUSTRIES_i + \mu_i \end{aligned} \quad (1)$$

where *NETWORK* is the director networks, *BSIZE* is the total number of directors on the board of the companies, *BMEET* is the total board meeting in a financial year. *DUALITY* take value of 1 if the firm has duality role of *CEO* and chairman and zero otherwise, *BIND* takes a value of 1 if proportion of independent directors on board is more than two-thirds, *ACIND* takes a value of 1 if all the audit committee members are independent, *INSTINV* is the percentage of shareholdings owned by top five largest institutional investor to the total number of shares issued, *AUDQ* take value of 1 if the firm is audited by Big 4 auditors and zero otherwise, *ETHNICITY* is the proportion of Bumiputera directors on the board to the total number of directors of the companies, *POLCON* takes a value of 1 if the firm is politically connected and zero otherwise, *FAMFIRMS* takes a value of 1 if the company is family-owned, *FIRMSIZE* is the natural log of total assets representing firm size, *LEVERAGE* is the total debt deflated by total equity.

The five network measures (DEGREE-I, DEGREE-E, EIGEN, BETWEENNESS and CLOSENESS) are discussed in the next section and regressed separately in the model. As for independent variables, this study employs common corporate governance variables used in prior studies (Al-dhamari & Ismail, 2013; Fauzi & Locke, 2012; Mohamad Nor, Shafie, & Wan Hussin, 2010).

Social Network Analysis

This section discusses the analysis employed in this study consists of a description of the Social Network Analysis (SNA) as well as company's corporate governance and institutional characteristics. Then, the correlation of all tested variables and the regressions for all network measures including DEGREE-IN, DEGREE-EX, EIGEN, BETWEENNESS and CLOSENESS are examined.

The SNA for this study is focused on current formal social network among directors. The SNA measurements were carried out using UCINET and NetDraw software packages developed by Borgatti et al. (2002). The network measurement computed by UCINET and the visualised by NetDraw. Table 3 shows the descriptive statistics for multiple centrality measurements at firm's level.

For instance, Tan Sri Datuk Asmat Bin Kamaludin has possible connections to other 81 directors in the sample where he secured through 10 company directorships. Hence, the number of directorships for this director could be interpreted as an indicator of director's credentials. He also is well-positioned in the entire network based on betweenness centrality value. He has position himself at possible 656325.125 paths to other director's connections. It is suggested that he is the director with the most access to another boardroom. He has eigenvector centrality value of 0.1060, and is 8th ranked among the top 20 directors. His direct connections with other directors also makes him well-connected to other directors. These indirect connections reflect the power and prestige he has gained throughout his tenure.

In order to visualise the network pattern for both at directors and companies level, network visualisation software NetDraw version 2.141 is used. The software is included in the UCINET software package. The software visualises a network using a spring-embedded application. This is to visualise the directors and companies connected by lines drawn closely together whereas unconnected directors or companies are pushed apart. The application treats network lines as springs with a particular elasticity and strength. The result is a graphical representation of the linkages between directors, as shown in Figure 1.

In Figure 1, the square shapes represent directors and lines represent connections between directors. The bigger the square shape is, the larger the connections the director has. The figure also shows that in the Malaysian stock market, the directors have created a network pattern of social relationships through directors' interlocks. The network pattern shows that relatively there are concentrations in the director's social networks. The level of concentration of director interlocks has severe consequences for maintaining the independence, transparency and accountability of corporate governance affairs to shareholders (Aviña-Vázquez & Uddin, 2013; Fracassi & Tate, 2012). Directors with a greater value of degree of centrality are considered as well-connected and positioned at the central of the network. The remaining directors will then be pushed apart from the network central accordingly based on the individual director's degree centrality value.

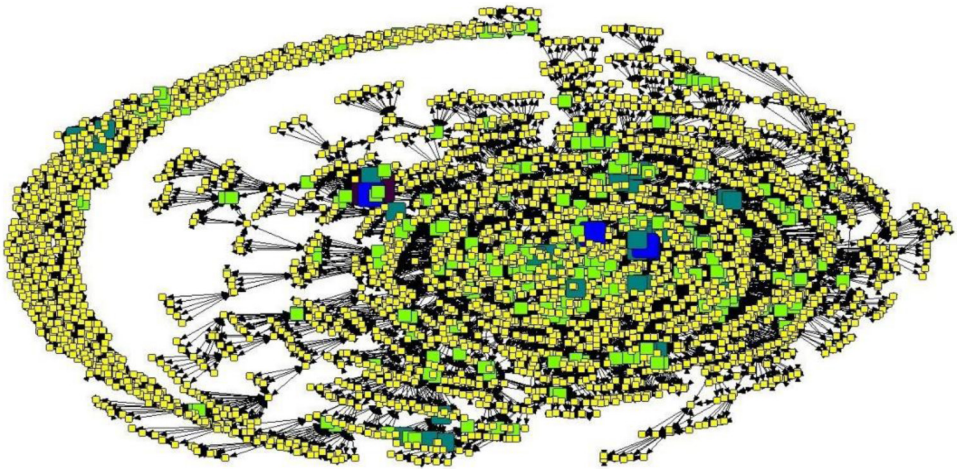

Figure 1. Network structure of board of directors for Malaysian publicly listed companies in 2011

RESULTS

It is important to note that the network structure at the company level showed 97 isolated companies. Isolated companies are those without any connections with the rest of the sample, as shown in Figure 2. Therefore, closeness centrality can only be used after whole network excludes isolated companies. Table 3 shows a description of all five network centrality measures.

Descriptive Statistics

At company level, the degree, which included all connection within and outside company, documented Network Centralisation Index (NCI) at 0.26%. This indicate the existence of small number of dominant personality in the network. The dominant individual director acquired 47 direct connections from multiple directorship appointments. The degree of external companies was documented NCI at 0.37%. A total of 283 companies (37.53%) have degree centrality valued above average. The remaining sample if 471 companies (62.47%) are valued below average. The highest degree centrality is 32 and the lowest is 0. The isolated 97 companies are valued at 0-degree centrality.

However, the eigenvector centrality values show relatively different results compared to degree centrality at the company level. The NCI is 78.20%. A total of 24 (3.22%) companies valued above average. The remaining sample 721 (96.68%) contributed to the majority companies valued below average. This

shows that not all well-connected companies have direct connections to otherwise unconnected companies. This also indicates the presence of an elite group with well connection with other well-connected companies. The network centralisation for betweenness centrality at company level is 5.08%. A total of 252 (33.42%) showed betweenness centrality valued above average. The remaining 502 companies (66.58%) valued below average. The maximum path from a company to other companies is 16125.363.

Table 3
Univariate statistics multiple centrality measurements at the company level

	Mean	Minimum	Maximum	Std. Dev.	NCI (%)
DEGREE-IN	12.117	4.000	47.000	5.680	0.26%
DEGREE-EX	5.404	1.000	32.000	4.817	0.37%
EIGEN	0.003	0.535	0.000	0.036	78.20%
BETWEENNESS	1124.751	0.000	15281.280	1819.042	5.08%
CLOSENESS	91.276	0.000	175.486	51.945	23.59%

In Figure 2, the networks structure shown is the network between companies. The company's network derived from the network analysis results at director level. This network consists of direct lines between any two companies if the company shared at least one director in both company boards. The calculation and visualisation for social networks at company's level is to examine the relational structure between companies. The square shape represents the individual company. As the number of direct connections between company increases, the large square shape. There are interconnections among companies in the Malaysian stock market for 2011. Worth mentioning that 92 companies have no direct connection with other companies in the network.

The results also suggest that there are opportunities for directors with lesser boardroom appointment, provided that they are able to exploit their own connections. A director's ability to fully utilise their own connection could improve his chances to be appointed at other company boardroom. The multiple directorships appointment could be seen as a proxy for director's reputation. Director with multiple directorships can be seen to have certain advantages over other such as resource exchange, control and influence over company's management (Renneboog & Zhao, 2011). Therefore, companies tend to appoint directors who are well-connected to other boardrooms (Barnea & Guedj, 2007). Appointment of well-connected directors' gives positive significant effects to company level of connectedness. It is suggested that the high degree centrality value for directors will contribute to high degree centrality of the company where

the directors appointed. A well-connected company will have greater access to information and communication channels.

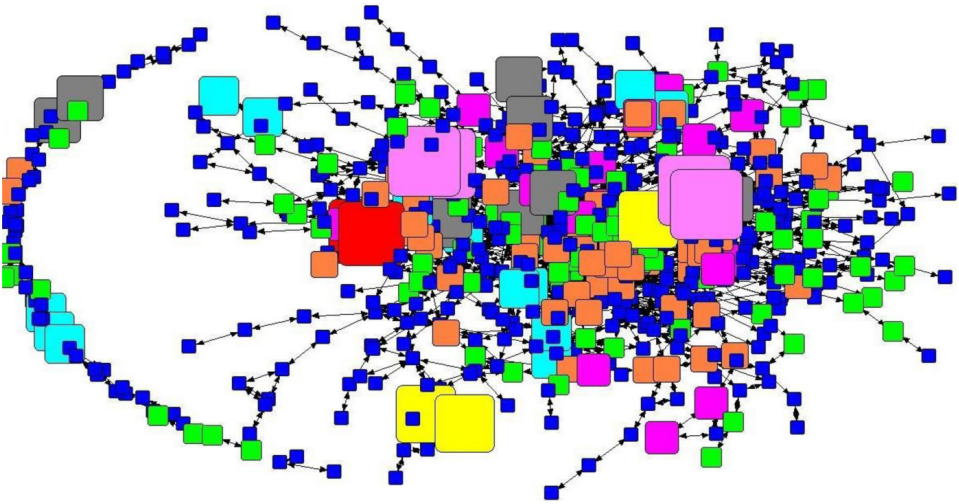

Figure 2. Network structure of Malaysian publicly listed companies in 2011

Table 4 describes the descriptive statistics of all variables in the model. Panel A shows all five network centrality measures namely DEGREE-IN, DEGREE-EX, EIGEN, BETWEENNESS and CLOSENESS. The 'n' indicate the normalised value of each network centrality. The normalised value will be using when comparing more than one set of networks for the same network centrality measures. In average, the DEGREE-IN shows that each company has 12 direct connections within and with external companies, ranging is between 11 and 47. The finding indicate that on average a company connected with other boards at 12, which includes the company itself, and with other companies. DEGREE-EX averages 4.69, which denotes the number of direct connections of the board outside the firm.

Panel B of Table 4 tabulates the descriptive statistics for the corporate governance variables. The average board has 7 directors, with a range of 3 to 18 directors. The average board meeting a company held is 5, with a range of 5 to 17. Only 27.7% of the sample companies combine the functions of CEO and chairperson (DUALITY), while 5.5% have boards that consist of more than two-thirds independent directors (BIND). About 62.4% of sample companies have an audit committee that consists entirely of independent directors. Institutional investors (INSTINV) average 2.89%, while just over half of sample companies are audited by a Big 4 accounting firm (BIG4).

Panel C tabulates the descriptive for remaining variables of this study. *Bumiputera* directors (ETHNICITY) make up on average 32.8% of the boards, whilst 50.2% of the sample companies are politically connected (Johnson & Mitton, 2003). About one-fifth of the sample are family companies (FAMFIRMS). The natural log of total assets (FIRMSIZE) averages 19.84, whilst the average ratio of debt to total equity (LEVEGRAGE) is 0.485. These figures are presented in Panel D of Table 4.

The correlations between the different network centrality measures are all above 0.50 and significant at the 1% level. This suggests that each network centrality measurement should not use in the same regression equation. The Spearman correlations between NDEGREE-IN and BIND are −0.065 at 1% level. The results are statistically significant but show a higher negative correlation for Pearson correlation. This is contrary to the expectation of the study that BIND decreases network centrality. FAMFIRMS, FIRMSIZE and LEVERAGE are significant at the 1% level with all network centrality measures for Spearman correlation. This is not surprising, since such companies tend to be managed by family members, and are well established with large company size. ETHNICITY and POLCON are also significantly positive with almost all network centrality measures. This suggests that firms with more *Bumiputera* or politically connected directors bring along their connections from other companies.

DEGREE-IN is a company's total internal and external direct links. DEGREE-EX is the total external direct links. EIGEN is the number of companies adjacent to a given company weighted by its degree centrality. BETWEENNESS is the proportion of all geodesic path from a firm to other pass through another firm. CLOSENESS is the sum of geodesic/shortest distances from a firm to all other companies. The normalised value for each network measurements is denoted by 'n'. BSIZE is the total number of directors on the board of the companies. BMEET is the total board meeting in a financial year. DUALITY take value of 1 if the firm has duality role of CEO and chairman and zero otherwise. BIND takes a value of 1 if proportion of independent directors on board is more than two-thirds. ACIND takes a value of 1 if all the audit committee members are independent. INSTINV is the percentage of shareholdings owned by top five largest institutional investor to the total number of shares issued. AUDQ take value of 1 if the firm is audited by Big 4 auditors and zero otherwise. ETHNICITY is the proportion of *Bumiputera* directors on the board to the total number of directors of the companies. POLCON takes a value of 1 if the firm is politically connected and zero otherwise. FAMFIRMS takes a value of 1 if the company is family-owned. FIRMSIZE is the natural log of total assets representing firm size. LEVERAGE is the total debt deflated by total equity.

Table 4
Descriptive statistics (N = 745)

	Mean	Median	Maximum	Minimum	Std. Dev.
Panel A: Network Centrality					
DEGREE-IN	12.117	11.000	47.000	4.000	5.680
DEGREE-EX	4.697	3.000	32.000	0.000	4.792
EIGEN	0.003	0.000	0.535	0.000	0.036
BETWEENNESS	1124.751	313.687	15281.280	0.000	1819.042
CLOSENESS	91.276	106.918	175.486	0.000	51.945
NDEGREE-IN	0.090	0.082	0.350	0.030	0.042
NDEGREE-EX	0.063	0.040	0.429	0.000	0.064
NEIGEN	0.483	0.000	75.718	0.000	5.162
NBETWEENNESS	0.405	0.113	5.499	0.000	0.655
NCLOSENESS	12.235	14.332	23.524	0.000	6.963
Panel B: Corporate Governance Variables					
BSIZE	7.416	7.000	18.000	3.000	1.935
BMEET	5.337	5.000	17.000	1.000	1.785
DUALITY	0.277	0.000	1.000	0.000	0.448
BIND	0.055	0.000	1.000	0.000	0.228
ACIND	0.624	1.000	1.000	0.000	0.485
INSTINV	2.899	0.000	72.630	0.000	7.081
AUDQ	0.544	1.000	1.000	0.000	0.498
Panel C: Institutional Variables					
ETHNICITY	0.328	0.250	1.000	0.000	0.265
POLCON	0.502	1.000	1.000	0.000	0.500
FAMFIRMS	0.213	0.222	0.714	0.000	0.215
Panel D: Control Variables					
FIRMSIZE	19.841	19.648	25.036	16.811	1.415
LEVERAGE	0.485	0.280	9.415	0.000	0.765

Multivariate Analysis

It is possible that the results demonstrate that a company may recognise the elite status of a newly appointed well-connected director into the company (Subrahmanyam, 2008). A well-connected director is appointed to allow the sharing of critical resources and information access from his connections (Johnson, Schnatterly, Bolton, & Tuggle, 2011). Table 5 presents the main regression of this

study based on a sample of 745 companies in 2011. The dependent variables from columns 1 to 5 include the network centrality measures, namely *DEGREE-IN*, *DEGREE-EX*, *EIGEN*, *BETWEENNESS* and *CLOSENESS*, respectively. The results found positive and significant association between board size and network centrality measures except for CLOSENESS. It is most likely that the additional appointment of new directors in a company establishes connections to the new company boardroom, hence increasing the direct connections of the company.

This study also found a significant negative association between board meeting and company direct connections. The increased number of board meetings may decrease the number of direct connections acquired from well-connected directors. Prior studies have documented that frequent board meetings are an indicator of board member response to poor company performance (Brick & Chidambaran, 2010; Vafeas, 1999). Thus, the results suggest that well-connected directors most likely to avoid being associated with company with poor performance. Being appointed as the director of poor performance company would damage a well-connected director.

As for duality, it is only significantly and negatively associated with closeness. Regardless the uncommon practices of duality in Malaysia publicly listed companies (Abdullah, 2004), the presence of duality in a company would decrease the ability the company to be closer to other companies. It is possibly due to the practice of duality commonly close related to companies managed by family members (Jaggi, Leung, & Gul, 2009). Consistent results are also shown for *FAMFIRMS*, which is significantly negatively associated with indirect network centrality measures, *BETWEENNESS* and *CLOSENESS*, respectively.

Further enhancing the understanding on influence of *Bumiputera* as well as politically-connected directors, this study found that both factors were significantly positively associated with all network centrality measurements, except in model 3. Consistent with prior studies, the presence of *Bumiputera* or politically-connected directors in a company in Malaysia has been one of the major elements since the establishment of the Malaysian capital market (Fung, Gul, & Radhakrishnan, 2015; Yatim, Kent, & Clarkson, 2006; Yunos, Ismail, & Smith, 2012). The presence of Bumiputera or politically-connected directors would increase both a company's direct and indirect connections. The embedded perception that *Bumiputera* or politically-connected directors are rich with critical resources and information access draws the attention of a company to appoint such directors for easy access to those critical resources (Fung et al., 2015; Smith, Halgin, Kidwell-Lopez, Labianca, Brass, & Borgatti, 2014).

Table 5
Main regression (N = 745)

Variable	(1)	(2)	(3)	(4)	(5)
C	−0.113	−0.203	−9.210	−1.860	−5.865
	−5.461* **	**−5.427*** **	**−1.609** **	**−4.614*** **	**−2.197*** **
BSIZE	0.011	0.006	0.306	0.031	0.017
	12.266* **	**3.832*** **	**1.484***	**2.320*** **	0.135
BMEET	−0.003	−0.005	−0.053	0.017	−0.083
	−3.812* **	**−3.797*** **	−1.047	1.121	−0.816
DUALITY	−0.002	−0.005	0.063	−0.052	−0.885
	−0.970	−1.030	0.149	−1.094	**−1.784** **
BIND	0.005	0.008	0.611	0.009	0.033
	0.970	0.939	1.174	0.085	0.030
ACIND	−0.001	−0.001	0.402	0.055	0.211
	−0.322	−0.326	**1.849** **	1.254	0.486
INSTINV	0.000	0.000	−0.017	0.006	0.014
	0.720	0.714	**−1.264***	**1.659** **	0.612
AUDQ	0.002	0.004	−0.377	−0.038	−0.260
	0.882	0.866	−0.970	−0.862	−0.635
ETHNICITY	0.020	0.035	0.055	0.290	1.863
	3.984***	3.992***	0.216	**2.692*** **	**1.870** **
POLCON	0.012	0.021	0.401	0.118	1.542
	4.826* **	**4.847*** **	**1.914** **	**2.627*** **	**3.445*** **
FAMFIRMS	−0.005	−0.010	2.312	−0.206	−1.721
	−0.931	−0.943	**1.753** **	**−1.746** **	**−1.700** **
FIRMSIZE	0.006	0.011	0.342	0.090	0.956
	6.341* **	**6.307*** **	**1.413***	**4.370*** **	**6.217*** **
LEVERAGE	0.003	0.005	0.181	0.087	0.459
	2.244* **	**2.208*** **	0.705	**2.388*** **	**2.820*** **
Industry Fixed	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.484	0.274	0.313	0.169	0.158
F-statistic	**44.637*** **	**18.564*** **	**22.183*** **	**10.451*** **	**8.656*** **
N	745	745	745	745	653
No. of Directors	4416	4416	4416	4416	3804

DEGREE-IN (1) is a company's total internal and external direct links. *DEGREE-EX (2)* is the total external direct links. *EIGEN (3)* is the number of companies adjacent to a given company weighted by its degree centrality. *BETWEENNESS (4)* is the proportion of all geodesic path from a firm to other pass through another firm. *CLOSENESS (5)* is the sum of geodesic/ shortest distances from a firm to all other companies. The normalised value for each network measurements is denoted by 'n'. *BSIZE* is the total number of directors on the board of the companies. *BMEET* is the total board meeting in a financial year. *DUALITY* take value of 1 if the firm has duality role of *CEO* and chairman and zero otherwise. *BIND* takes a value of 1 if proportion of independent directors on board is more than two-thirds. *ACIND* takes a value of 1 if all the audit committee members are independent. *INSTINV* is the percentage of shareholdings owned by top five largest institutional investor to the total number of shares issued. *AUDQ* take value of 1 if the firm is audited by Big 4 auditors and zero otherwise. *ETHNICITY* is the proportion of *Bumiputera* directors on the board to the total number of directors of the companies. *POLCON* take value of 1 if the firm is politically connected and zero otherwise. *FAMFIRMS* takes a value of 1 if the company is family-owned. *FIRMSIZE* is the natural log of total assets represent firm size. *LEVERAGE* is the total debt deflated by total equity. ***, ** and * denote significance at 1%, 5% and 10%.

Additionally, *Bumiputera* are generally characterised as team players that uphold Islamic values and beliefs, thus manifesting their ability to enhance company performance (Jamaludin & Abdul Wahab, 2016; Yunos et al., 2012). Finally, this study has documented a significant positive association between firm size and all network centrality measures. The larger the size of company, the more likely that better-connected directors are appointed in the company boardroom. Similarly, an increase of the leverage of a company indicates a need to appoint more or better-connected directors.

CONCLUSION

From the full account of the publicly listed companies in Malaysia, this study provides insight into the complex network structure of directors and companies. Prior studies in social network analysis emphasized the significant influence of network structure based on the selected companies sampled. This study has also explored the significant differences between director networks and company networks. The results of analysis provide evidence that a relatively moderate number of directors and company in Malaysia has the opportunity to enjoy a certain amount of power and influence. Corporate governance practices may be associated with the connections a director has during director nomination. Additional tests are suggested to examine whether these group of directors and companies do in fact apply certain exercises.

In addition, the study has identified a relatively important attribute, in those directors or companies who are well-connected and well-positioned to exert power are generally noticeable to other in the same network. A director who has multiple directorships has social group in the same boardrooms, may be one of the possible justifications. Consequently, there is a chance that directors with multiple directorships also have multiple directorships in other boardrooms. This study also provides reasonable justification relates to the restriction number directorship enforce for Malaysian publicly listed companies by Bursa Malaysia Berhad. For listing requirement, the maximum number of directorship for either publicly listed or private company have been imposed. The regulations emphasized the importance of directors to perform their duties and obligation for the interest of publicly listed company's shareholders. The directors are believed to effectively fulfil their duties and obligations by providing better governance for the company.

This study is subject to several limitations. First, it is limited to Malaysia publicly listed companies for a one-year period. While the sample encapsulates the majority of Malaysian large publicly listed companies, other large private companies were excluded. Second, the study did not explore the role that directors

are assigned, whether executive or non-executive, or related committee members within the companies, which also may influence the director connections. The SNA used in this study only considers one social connection, namely the director's formal appointment as a board member. Further analyses of other forms of social connections such as co-membership in any social organisations, alumni or other professional bodies' memberships are suggested. These forms of social connections also connect directors, even to unconnected directors from formal networks. Thus, for future research, it is essential to explore whether the exercise of power by the directors and companies in fact actually takes place.

In addition, social networks in the form of informal relationships should be further explored, including the impact of the informal connections as part of a contribution to social network studies. Studies should also be conducted concerning private companies. The additional value of director networks could be captured by including private companies, as a director may hold directorships at both publicly listed and private companies.

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