

From Fiction to Fact: The Impact of CEO Social Networks

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Abstract

This paper investigates the relationship between a CEO's social network, firm identity, and firm performance. There are two competing theories that predict contradictory outcomes. Following social network theory, one would expect a positive relation between social networks and firm performance, while agency theory in general and Bebchuk's managerial power approach in particular predicts a negative relationship between social networks and firm performance. Based on a new and comprehensive measure of CEOs social networks, we observe for 363 non-financial firms in the UK that the size of a CEO's social network affects firm performance negatively. Even so, growth companies are actively seeking CEOs with a large social network, which is in line with the social network theory. Still, we find evidence in support of the argument that well-connected CEOs use the power they obtain through their social network to the detriment of shareholders.

Keywords: CEO, boards of directors, social network, accounting performance.
JEL classification: G34, L25, Z13

1. Introduction

Popular prejudice sometimes suggests that CEOs land their jobs through connections made on the golf course rather than through outstanding performance on the job; hence that it is more important who you know than what you know. Such a biased selection process would run counter the best practice of board nomination committees and violate the spirit of the various corporate governance reforms around the world. It would ultimately damage the performance of the firm. We aim to establish empirically whether this popular belief can be disregarded as a popular myth, or if it is indeed a fair reflection of reality. In particular, we want to understand under which circumstances boards find it important for CEOs to have access to social networks, and whether the board structure has any influence on the social network characteristics of the CEOs they choose. Ultimately, we are interested to know whether well-connected CEOs are a benefit or a cost to the companies they manage. An answer to this question is of much wider policy relevance, as any underperformance will point towards a corporate governance failure in either the selection or subsequent monitoring process of the CEO, or both.

Our empirical analysis is based on two competing theories – the social network theory and Bebchuk’s agency theory based managerial power approach – that predict contradictory results for the relation between social network and performance. With this paper, we aim to shed light on and validate either of the two theories on the prevailing impact of a CEO’s social network on the firm. In effect, we follow the recommendation of Karl Popper (1959, p. 108), and “choose the theory which best holds its own in competition with other theories; the one which, by natural selection, proves itself the fittest to survive”. Following social network theory, one would predict a positive relation between social networks and firm performance, since the networks improve the flow of information and the exchange of know-how, thus reducing information asymmetries among managers. In contrast, agency theory predicts a negative relationship between social networks and firm performance, as social connections lead to lower monitoring and more freedoms for the manager, which she uses to her advantage, and the detriment of shareholders’ wealth.

It is paramount to the success of any firm that boards select the best person to be CEO. This requires an unbiased selection process, where the board chooses – amongst other things – the optimal level of social network exposure of a CEO. It is important that a board does not allow itself to cloud its choice for a new CEO by social influence activity from board members or others outside the firm. In fact, corporate governance rules and criteria establish institutions and standards that should lead to an unbiased selection process of the CEO, as well as other executive and non-executive board members.

With this empirical paper - based on data from 363 UK based non-financial firms and a comprehensive measure of social networks of CEO's - we aim to turn fiction about the role of social networks into facts about its importance in the selection process, as well as its ultimate impact on firm performance. Hence, in this paper we ask ourselves two distinctly different research questions. In the first, we aim to understand the determinants of CEO selection, hence what are the properties boards look for in a new CEO. Second, once they have been appointed, we want to understand how the access to social networks affects the performance of the firm.

We find that a CEO's large social network has a negative impact on firm performance. We also show that innovative high-growth companies actively choose well-connected people as CEOs, likely in anticipation that her social networks provide support in the innovation process. In contrast, highly leveraged firms choose CEOs with a small social network, possibly because boards believe that socially unconnected leaders might be better in managing these firms under pressure. In conclusion, we find evidence in support of Bebchuk's managerial power approach and argue that managers use their social network to the detriment of shareholders.

This paper is organized as follows: the next section reviews the literature on social networks, while Section 3 outlines the two competing theories on social networks and develops the corresponding hypotheses on how it should affect the firm. Section 4 describes the data and methodology, and Section 5 presents the results. Section 6 concludes.

2. Literature

Research into the social network effect on boards goes back more than 20 years, focusing initially on board interlocks, which centered on analyzing the phenomenon that CEOs sit on each other boards' and so form a small social network. According to one point of view, these interlocks are beneficial as they allow the diffusion of innovations through which a variety of policies and practices are spread across firms (e.g., Davis, 1991; Mizruchi, 1992; Palmer, Jennings and Zhou, 1993; Westphal and Zajac, 1997). In contrast, there is the reciprocity of favors argument asserting that CEOs protect each other on their respective boards, are only accountable to themselves, and so tend to be protected from the disciplining forces of the market (Useem, 1984). Westphal and Zajac (1996) argue that these interlocks lead to self-selection of board members, with the equilibrium outcomes of powerful CEOs selecting passive outside directors, or powerful boards selecting a CEO with a reputation for actively monitoring management. However, interlock research has its clear limitations, with one of the main concerns being that "its primary focus [is] on the effect of direct ties or relational embeddedness on firm behavior to the exclusion of more distant network ties or structural embeddedness" (Gulati and Westphal, 1999, p. 473).

Recently, another strand of the literature emerged that focused on establishing whether social networks exist on corporate boards. For example, Davis *et al.* (2003) study the structure of the corporate elite network in the US during the 1980s and 1990s. They concentrate on the degree of clustering, the length of the paths connecting any given directors, as well as the stability of the observed network.¹ They find a remarkable stability of the network over the years they study, despite considerable changes in both the role of the commercial banks and corporate governance rules affecting boardrooms. The elimination of important market 'players' - such as bankers - from the network has not altered the general characteristic of the network. They also observe a high degree of

¹ Path-length is measured as the number of directors (boards) required to create a link between two directors (firms). Clustering is 'the proportion of possible ties among actors that are realized' (Davis *et al.* 2003, p. 316), and network stability is seen as the degree of change to path-length and clustering over the years.

clustering and short average path-lengths (both indications of a small world phenomenon on boards; see below for more details). They conclude that networks appear to be universal, and affect the whole cross-section of US companies.

Robins and Alexander (2004) use ‘affiliation’ networks, i.e. networks distinguishing between individuals and boards as different types of social entities, to establish whether a small world effect exists on boards. This is the case once they can observe clusters of board members that are well connected amongst each other, but also have good links to other groups. Based on data from Australia and the USA for 1996, they establish that the small world effect “is shaped more by decisions by some (not all) company boards to appoint moderate to high numbers of interlockers as directors, rather than by certain interlockers seeking to be on unusually large numbers of boards” (p. 84). In other words, they find different outcomes for the company-to-company and director-to-director networks, with more evidence of small world characteristics in the former than the latter. These results are in line with an extensive body of research on the small world effect, that in summary confirms the existence of social networks on corporate boards (for a good overview of the literature on the small world effect see Uzzi *et al.* (2007)).

Conyon and Muldoon (2006a) examine large samples of both boards and directors for the USA, UK and Germany. They use a similar approach to Newman *et al.* (2001) to derive theoretically expected values, which they then compare to their small world statistics without having to generate random graphs. They conclude that even though the small world phenomenon exists between boards of directors, they cannot find evidence for “clubby” behaviour in the boardroom. In other words, there is no more systematic structure, no stronger tendency towards ‘smallness’ than one should expect to find by chance (p. 21). In a companion paper, Conyon and Muldoon (2006b) establish that ‘busy’ outside directors sit on boards with other outside directors, but find no statistically significant indication of exclusive networks amongst CEOs.

Bebchuk *et al.* (2007) argue that CEO centrality, hence the relative importance of the CEO vs. the management team, has a negative impact on firm performance. This means, the more power and importance the CEO holds within the top management team, the less the firm ranks on a number of performance indicators.

We aim to fill a gap in the literature by putting the CEO, and not the board, at the centre stage of our analysis. We expand the literature by establishing whether certain board and firm characteristics influence the choice of CEO in terms of her social network structure, and ask ourselves if a CEO's social network does create value for the firm, or not. In addition, by relying on a novel and more holistic measure of social network, we can measure the impact of social network much more precisely than previous studies.

3. Theory and Hypotheses

Determinants of CEO Selection

How do social networks influence the work of executive and outside directors? Sociology based social network theory argues that workers frequently locate jobs through friends and relatives rather than through the open job market (Granovetter, 1973, 1974). Subsequent research developed the idea that so called weak ties are relatively more important in relaying valuable and suitable job offers more frequently than strong ties, and that a matching process through weak ties is superior to an open market process (Granovetter, 1983 and Montgomery, 1992). Strong social ties are those ones with family and close friends, and indicative of a group of very similar personalities and background (e.g. same jobs, neighborhoods, alumni connections). As a result, a group of people connected by strong social ties will have access to similar information, with each new member only making a marginal contribution to the group's information base. In contrast, people with whom only weak social links exist might be able to provide new information, which is of much higher value to the group (Strahilevitz, 2004).

As a result, weak ties are playing an important role in transmitting information through organizations in particular, and society in general. This exposes the weakness of measuring social integration through board interlocks, as board interlocks primarily represent current strong ties. It ignores weak ties, as well as ties formed through previous interactions - some of which might date back many years. This means that by measuring board interlocks, the information exchange and innovation capacity of social networks might be widely underestimated. A holistic measure of social network exposure of a

CEO, like the one used in this paper, is therefore necessary to estimate the information exchange through weak links.

Organizations typically innovate – with the aim of creating new products based on re-configured existing technologies, or newly developed technologies – by increasing both their depth and breadth of the knowledge base and deploying it in new directions (Tushman and Anderson, 2004). Having exposure through weak links to a diverse set of people with different backgrounds and technical expertise increases the knowledge base, and thus provides a fertile ground for product and process innovations. It also offers the necessary support for the managerial challenge to reconfigure the firm so that it can exploit the fruits of its innovation. It is therefore important that a CEO of an innovative company, which are typically also high-growth firms, has access to a large number of weak ties. This should provide her with the diverse information necessary to foster and accelerate the innovation process and quality within the firm. In conclusion, we anticipate that boards of innovative high-growth companies are actively searching for and hiring CEOs with access to a large social network. Therefore, we hypothesize that:

H₁: High-growth firms hire well-connected CEO's.

The corporate finance literature generally assumes that higher level of debt can act as a disciplining device for managers, as it increases the likelihood of bankruptcies, which are particularly costly for managers (Tirole, 2006). High levels of debt are normally a sign of firms under stress, but are also actively used by Private Equity houses and other active investors as a form of corporate governance device. In both cases, these highly leveraged firms normally aim to restructure their operation, close loss-making lines of business, and (re-)focus on profitable parts of the operation. There is normally little need for risky innovation during such restructuring periods, but instead for focused and diligent execution of the restructuring plan. We therefore predict that boards choose a CEO that has these capabilities and so hypothesize that:

H₂: Firms under stress (high leverage) will hire focused CEO's with only a small social network.

CEO Connectedness and Firm Performance

As we have outlined above, access to social network allows for a quick transfer of expertise and best practices between connected people and companies, which in turn enables it to exploit new opportunities (Geletkanycz *et al.*, 2001). Exploiting new opportunities will give the CEO the chance to grow the company by either developing new products through product innovation, or gaining a competitive advantage in producing existing products through process innovation. This improved innovation process will lead to new opportunities for the firm, and a subsequent growth of the firm's turnover. In addition, a CEO's social network can help to 'open doors' and push sales. There is indicating in the prior literature that the directors', albeit not the CEO's, social network has an impact on the sales of companies that deliver to the public sector. For example, Agrawal and Knoeber (2001) illustrate how politically connected directors can help their companies attract government contracts. Based on the assumption that the CEO promotes her company's interests, we predict that:

H₃: The size of a CEO social network has a positive influence on sales growth

A well-documented argument, which stems from agency theory, points towards a negative relationship between social networking on board level and firm performance. This argument is based on the premise that directors exploit the inherent information asymmetry to pursue their own wealth maximization objectives to the detriment of shareholders' wealth. Over the years, a significant literature has developed that addresses the impact of a board's social network on the firm's corporate governance practices. Hallock (1997), for example, finds that the pay of US CEOs who sit in interlocked boards is on average higher than the pay of CEOs who are not in interlocked boards. He also reports high levels of interlocking for his sample of large US firms; the interlocked firms range from 8% to 20% of the total sample depending on the definition of interlocks. Fich and White (2003), again on US data, find that interlocking between boards tends to increase CEO compensation and decrease CEO turnover. They interpret their results as a consequence of entrenchment. They, however, fail to establish a significant relation

between directors' interlocking and firm performance. Fich and Shivdasani (2006), using a different measure of networking, namely the number of directorships held by outside directors, find that 'busy boards' are associated with weak corporate governance and low sensitivity of CEO turnover to firm performance. In particular, they report insignificant differences in the CEO turnover sensitivity between busy and insider dominated boards. They also present a negative and significant relationship between firm accounting performance and the existence of busy outside directors. Barnea and Guedj (2006) find a strong positive relation between connected boards and CEO compensation, even after controlling for observed and unobserved firm and CEO characteristics (i.e. geographic location of the firm; interlocked, busy and entrenched boards; different governance measures, etc). It is important to point out, though, that the literature has not established a clear relationship between directors' interlocking and CEO total compensation (see for example Core *et al.*, 1999). In addition, the literature has failed to establish a clear relationship between outside director independence as an indicator of governance and firm performance (for a review on this topic see Hermalin and Weisbach, 2003).

Kramarz and Thesmar (2006) analyzing the issue of social networks for a French sample observe that social networks affect both the board composition and corporate governance policies. In particular, they find that companies with a well-connected former civil servant as CEO have worse accounting performance and are more likely to employ other ex-government employees on their boards. These companies also have lower sensitivity between CEO turnover and performance. In addition, the CEOs who came from the civil service are more likely to hold outside positions in other firms, which leads to the likelihood of holding multiple board seats (in 42% of all cases vs. 12% for non-civil servants). In support, Nguyen-Dang (2005) documents that once the CEO and other board members share the same social circle, underperforming CEOs are less likely to be fired. If nevertheless these CEOs are ousted from their position, they are then more likely to find a good position afterwards. However, there is both empirical and theoretical evidence that points towards this being a general problem across boards, and not an isolated French phenomenon. McDonald and Westphal (2003, p. 7) have pointed out that "network ties to individuals who are similar on salient demographic characteristics, including functional background, are more likely to facilitate the exchange of social

support”. Westphal and Milton (2000, p. 373) argue that those social network ties that were formed across different boards will lead to “particularly high levels of social cohesion”, and so to strong group identity that provides social support and protection, which allows CEOs to exploit their position to the detriment of shareholders. Following this strand of literature, we predict that:

H₄: The size of a CEO’s social network has a negative impact on firm performance

4. Method

Sample and Data

Based on a comprehensive sample of UK FTSE-250 and FTSE-Small Cap companies in 2005, we collected our social network, corporate governance and ownership information from BoardEx database. BoardEx covers all FTSE-250 companies and 227 out of 332 FTSE-Small Cap companies. We follow common practice in the corporate governance literature and exclude financial firms. This gives us a final sample of 363 firms with an aggregate market value of £204 billion at the end of December 2005.

From BoardEx we collected data on the employment history for all CEOs in the sample, as well as data on CEO tenure, CEO/Chairman duality, and the size and independence of the board of directors. We sourced accounting data from Thomson Financial Datastream, collecting data on accounting performance, leverage, size, and growth opportunities. We measure accounting, and not market returns since they are less noisy and capture more directly the impact of CEO effort – although we acknowledge that they might be subject to managerial manipulation (Hambrick and Finkelstein, 1995). We measure firm performance in terms of return on equity (ROE) and return on assets (ROA), as in Core *et al.* (1999).

Our analysis is based on UK data, which in terms of board standards are very comparable to the US. Both countries have a unitary board, and both countries require the

nomination committee to comprise of outside directors only. The countries differ in that it is common in the US to have a joint Chairman and Chief Executive, whereas in the UK these two positions are commonly split. The results of this UK based research are therefore almost perfectly transferable to the US.

Variables

The CEO networking variable constitutes a cumulative variable measuring the total number of dyads with which this person has shared the board either of a public company or of other (e.g. non-profit) organizations. It calculates direct ties created through all CEO appointments, i.e. both executive and non-executive, but not indirect ties, i.e. ties that *might* have developed through a third director serving on both boards.² Our more holistic measure of social network encompasses not just the dyad interlock but a more realistic measure of a person's connections amassed over the lifetime. It is empirically calculated, based on individual CEO and not firm level data³, and is not dependent upon theoretically estimated benchmarks like random or bipartite graphs as commonly used in the existing literature (Robins and Alexander, 2004). As previously pointed out, our variable allows a much more precise estimation of a person's social network.

Given that our main variable on social networks is cumulative restricts our investigation to a one-year cross-sectional analysis. However, this will only marginally affect our results, as the year-to-year changes of social networks are small; therefore using panel data would be of limited value only as there is no significant time series variation in the dependent variable. Our measure of CEO social networks is a significant improvement to comparative measures previously used in the literature, i.e. interlocking and busy boards, as it depicts more accurately the cross-sectional variation of the personal networks of each CEO in our sample. In particular, it incorporates the weak

² The measure of indirect networks has previously been included into empirical studies. In such case, two directors A and B from different boards are considered connected just because another director C sits on the boards of both A and B. Whether A and B actually know each other, which will allow them to exchange information, know-how etc, is not examined by such measures.

³ Firm level measures are likely to overemphasise the networking effect since they calculate (and treat equally) ties of any member of the board, executive and non-executive, to the boards of other companies. In Barnea and Guedj (2006) the binary "links" variable takes the value of one for any tie of any member of the board to other firms.

links, which are – as we have discussed above – of particular importance for the transformation and collection of diverse information, and are essential to the innovation process.

We also use the information on CEOs previous employment to construct an individual industry dependence variable that allows us to investigate the nature of networks. This variable is a binary one, getting the value of one (zero) if the previous employment of the CEO was in a firm in the same (different) industry. By previous employment, we mean any type of executive, managerial, and rank and file employment apart from outside director positions. We exclude the outside director type of employment as this does not necessarily require, or indeed provide, industry specific knowledge or expertise. We predict a negative relation between networking and career path; a CEO that has spent most of her time within an industry will have less chances of creating a large network (number of direct ties).

CEO tenure is measured as the number of years the CEO has retained this position. Finally, CEO/Chairman duality is strongly encouraged in the Combined Code; we measure it using a binary variable that is one whenever the different roles are separated, zero otherwise.

Regarding financial indicators, we measure firm size by Total Assets (TA)⁴ and leverage as the ratio of Total Debt to Total Equity. We expect networking to be positively related to firm size. As larger firms attract better managerial talent, we assume that this would lead to a better supply of high-quality outside directorships (Fich, 2005).

As an indicator of growth opportunities we use the ratio of Market to Book Value (MtB), and measure realized growth opportunities in terms of sales growth. We also collect data on ownership blocks, and report both the number of major shareholders with an ownership block above 3%, and their aggregate ownership stake.

⁴ As robustness check we have also used market capitalisation as a firm size proxy. All regression results are qualitatively the same and the networking-performance relationship even more statistically significant (untabulated results).

Analysis

We rely on one and two-stage regressions to establish the relationship between a CEO's social network and firm characteristics, building on the descriptive statistics to examine the extent and structure of CEO networks in the UK market. Looking at the descriptive statistics, we are especially interested in identifying industry and size effects to give us more insights and understanding how these networks are developed.

In order to test our determinants of CEO selection, we run linear OLS regressions; the dependent variable is our measure of CEO networking. The independent ones consist of corporate governance quality indicators and, measures for firm leverage and growth opportunities (MtB), and a number of other firm specific controls. We argue that firms with certain characteristics look for CEOs with particular distinct features, and not the other way around. Therefore, the two models used are as follows:

$$NW = \alpha_1 + \beta_1 CG + \gamma_1 CC + \varepsilon \quad (1)$$

$$\text{and } NW = \alpha_2 + \beta_2 CP + \gamma_2 CG + \delta_2 CC + \varepsilon \quad (2),$$

where NW (Network) is our measure of CEO networking; CG is a vector of corporate governance variables including CEO tenure, size of the board of directors, independence of the board and CEO/Chairman duality; CC is a vector of firm specific variables including leverage and growth opportunities as well as FTSE index membership, and firm size. The variable CP that appears independently in the second model is our indicator of career paths, i.e. previous employment within the industry.

To test for the impact of CEO connectedness on firm performance, we utilize two different methodologies, measures of performance as well as different performance time scales. In the first step, we analyze the impact of a CEO's social network on sales growth, relying on a simple OLS regression of the type:

$$S = \alpha_3 + \beta_3 NW + \gamma_3 CG + \delta_3 CC + \varepsilon \quad (3),$$

where S is the dependent variable and takes 3 different forms. In model 1, we use the unadjusted net sales growth for the year. The dependent variable in model 2 is the industry adjusted net sales growth for the year, whereas in model 3 is a binary one, taking the value of one (zero) for above (below) industry average growth in net sales.

In a second step, we analyse the impact of networking on accounting performance. We initiate our analysis by using linear OLS regressions; the initial model is:

$$\Pi = \alpha_4 + \beta_4 NW + \gamma_4 CG + \delta_4 CC + \varepsilon \quad (4),$$

where Π is the contemporaneous performance measured by the return on equity (ROE) and return on assets (ROA). Everything else is defined as in model 1. However, model 4 is conceptually weak for two reasons. First, because of the described endogeneity issue between networking and corporate governance.⁵ This consequently means that our NW variable is conditioned on the CG vector; therefore treating these variables as independent contradicts models 1 and 2. Second, there is an endogeneity issue between firm performance and networking that cannot be resolved in the context of model 4. In particular, by using model 4, we only assume the real direction of causality between our measure of networking and the accounting performance variables we utilize. Even though we predict that networking drives performance, there is also the argument that performance can change networking. Fich (2005) observes that CEOs are more likely to obtain outside directorships when the companies they manage perform well. We follow Fich and Shivdasani (2006) and also test this ‘inverse’ relationship as a robustness check.

⁵ The issue of non-independence between the networking and CG variables also affects model 3. Therefore, as a robustness check, we have also run a 2SLS regression for the Sales Growth model to account for this. The results remain qualitatively the same (untabulated results). Note that this 2SLS regression is not as the one described in equations 5.1 and 5.2 since it is not clear whether the “direction of causality” problem also applies here.

We present two methodological solutions to deal with these problems. The first is theoretically robust and deals with both issues mentioned above. We create a system of equations and run a two stage least square regression, of the following arrangement:

$$NW = a_5 + \beta_5 \Pi + \gamma_5 CG + \delta_5 CC + \varepsilon \quad (5.1)$$

$$\Pi = a_6 + \beta_6 \widehat{NW} + \gamma_6 CC + \varepsilon \quad (5.2)$$

Model 5.1 is the equivalent of model 1 but with performance as an added independent variable to control for the inverse relationship. In model 5.2 we use the fitted values of NW to test the relation between networking and performance.

An alternative way to deal with the endogeneity problem is to use long term, instead of contemporaneous, performance. In this case we use a five-year performance average⁶, which coincides with the average CEO tenure in our sample. Therefore, the model becomes:

$$\Pi_{-5y} = \alpha_7 + \beta_7 NW + \gamma_7 CG + \delta_7 CC + \varepsilon \quad (6)$$

5. Results

Descriptive Statistics

The 363 firms in our sample are operating in 27 different industries. Most prominent is the Service sector that accounts for more than 25% of all firms in our sample, followed by Retailing (just above 9%), Construction (7.7%) and Media (7.2%). For the full list of the sector distribution, please see appendix 1.

In respect to CEO connectedness, the average CEO in our sample established 76.98 (median: 35) boardroom links over her corporate lifetime, ranging from 90 (47.5)

⁶ Our measure of networking is a cumulative one, calculating the direct ties developed by the CEO over her corporate lifetime. Therefore, 5 years of connections will only have a marginal effect on the overall number. Using a 5 years performance horizon establishes a more balanced measure of performance, and is in line with the average CEO tenure in our sample. As a result, we believe that the benefits of using non-matching time horizons outweigh possible drawbacks.

ties for the average CEO of a FTSE-250 company to 64 (21) for the equivalent of a FTSE Small Cap company. These results reflect the fact that larger firms have bigger boards, but also that larger firms can attract and afford better managerial talent (see the analysis in the previous section).

As far as career paths are concerned, 78% of the CEOs were previously employed within the same industry, but 22% changed the sector. The career path variable is not significantly different for FTSE-250 and FTSE Small Cap companies, which indicates that any variation in this variable is driven by industry and not size effect. CEOs of smaller firms have significantly longer tenure (5.61 years) when compared with the tenure of the CEO of FTSE-250 firms (4.61 years). This is consistent with the idea of higher mobility between more talented human capital. It is incompatible though with the idea of higher retention rates in bigger firms, where the value of the marginal managerial product is greater (Baker and Hall, 2004). As far as our other measures of corporate governance quality indicators (board independence and CEO duality) are concerned, the larger FTSE-250 firms perform significantly better than do the smaller companies in our sample. In addition, the FTSE-250 firms do not significantly differ in respect to leverage and market-to-book ratio, but outperform the smaller companies when measured by both ROE and ROA (even though the differences are less pronounced when adjusting for outliers in our sample). This is not the case though in terms of sales growth, where the differences between the two sub-samples appear to be statistically insignificant. We finally note that there are significant differences between mean and median values for the non-binary variables presented in Table 2. To compensate for this, we transform – in line with Aggarwal and Samwick (1999) – these variables by ranking the results along the cumulative distribution function (CDF).⁷

(Insert Table 1 about here)

We observe substantial industry variation in respect to CEO social networking. The picture depicted in appendix 2 is consistent with the argument that sectors that are

⁷ The CDF is obtained by ranking the observations in ascending order, based on the value of the variable, from 1 to the sample size, subtracting 1, and dividing by the sample size minus 1.

more specialized have less connected CEOs, as CEOs spent their career within narrow sectors and have fewer opportunities to build up a social network (as we will see below). Indeed, we see some exceptions in Aerospace & IT Hardware, we observe below median values for industries such as Chemicals, Electronic & Electrical Equipment, Health, Oil & Gas and Pharmaceuticals, while Automobiles & Parts, Leisure & Hotels, Telecommunication Services and Transport employ CEOs with above median social networks. We also observe considerable industry variation among the career paths of CEOs. We find a significant negative correlation between career path and social network of the CEO, which means that – as we would expect – CEOs that work within one industry only are considerably less connected than those that also take jobs outside their industry. However, it is interesting to see that highly specialized sectors like Chemicals, Oil & Gas and Pharmaceuticals & Biotechnology draw CEOs with highly diverse and industry unspecific career paths, while Automobiles & Parts, Construction, Engineering & Machinery and Transport hire CEOs from within. The IT Hardware sector has an above average career paths; this is consistent with the idea that in specialized sectors CEO recruiting is done from within the industry (see appendix 3).

Table 2 below depicts the correlation matrix amongst the various variables we employ in this study. Thereby, board size is positively related to firm size ($\approx 40\%$, depending on the firm size measure), as the various measures of size and performance are correlated with each other, and – as reported above – career path and social network are negatively and significantly correlated.

(Insert Table 2 about here)

Determinants of Networking

In support of hypothesis 1, we observe that boards of high growth companies, measured by a high MTB ratio, are actively searching for well-connected CEOs when making their hiring decision. Boards value the better information exchange, and so better innovation abilities, of well-connected managers, and actively selecting them as CEOs. This argument finds support by Fich (2005), who argues that firms with growth

opportunities want to attract managerial talent with a lot of exposure to the outside world, which in turn is positively correlated with networking.

Following the theoretical argument that forms the basis of hypothesis 2, we establish a negative relation between financial leverage and a CEO's social network. High gearing of the firm leads to higher risk of bankruptcy, which in turn focuses the minds of managers on restructuring the firm and improving its financial position. Boards of these firms select a CEO with a small social network. The benefit of hiring a focused manager with few other commitments appears to be more important than the ability to innovate.

On a side note, we observe that the size of a CEO's social network is not randomly determined, as is suggested in parts of the social networks literature, but is dependent on a career progression factor. Table 3 below depicts the corresponding results. The first model represents the base model, with the second one controlling additionally for a CEO career path.

(Insert Table 3 about here)

In addition, we observe no relation between CEO tenure and CEO's social network. This is in contrast to Nguyen-Dang (2005) that documented a positive relation for France, and leads us to believe (although not conclusively, as we have no information about the quality of the social circle) that CEOs in the UK do not receive protection against dismissal from their social network.

As expected, we find a positive relationship between CEO networking and board size. We were puzzled though to find, after controlling for firm size, a positive relation between a CEO's social network and board independence measured in terms of the ratio of outside directors. This result is in line with the agency theory based managerial power approach put forward by Bebchuk *et al.* (2002). This theory argues that outside directors are not truly independent of the CEO since they are employed and remunerated by her. Following this (arguably cynical) line of argument, this would imply the perception that well-connected CEOs use their ties to bring a higher ratio of 'independent' directors, and use their control to deceive the public by giving the impression of a high-value board.

This explanation implicitly also casts doubts on the effectiveness of the definition of independence.⁸ Finally, we observe a statistically insignificant relation between networking and the ownership variables. It appears that the existence of blockholders, i.e. shareholders with a significant stake in the company, in the ownership structure of the firm does not affect the size of the CEO network.

CEO Networks and Firm Performance

In this paper, we base our analysis of firm performance on both sales growth and accounting performance. When analysing sales growth, and basing our analysis on three different measures of sales growth, we find no significant relationship between sales growth and a CEO's social network. Therefore, we have to reject Hypothesis 3. This is an important finding, as it raises considerable doubt whether well-connected CEOs can either add to the innovation process within the firm, or open, to a significant degree, doors and help in the sales process. In any case, a CEO's social network does not seem to have a beneficial impact on the firm's sales performance, which challenges the very assumption under which boards hire well-connected CEOs. Surprisingly though, we could establish a negative, and for two out of the three measures significant, relationship between board independence and sales growth. At this point, we can only speculate about possible reasons for this result. One possible explanation is that outside directors prevent managers from pursuing additional but unprofitable projects.

(Insert Table 4 about here)

⁸ According to the Higgs (2003) report: "A non-executive director is considered independent when the board determines that the director is independent in character and judgement and there are no relationships or circumstances which could affect, or appear to affect, the director's judgement." (p. 37)

The relationships are defined as: former employee; having material business relationship with the company; has received or receives additional remuneration from the company; has close family ties with any of the company's advisers, directors or senior employees; *holds cross-directorships or has significant links with other directors through involvement in other companies or bodies*; represents a significant shareholder; has served on the board for more than ten years.

Even though cross-directorships are mentioned the focus is on current ties. There is no provision to exclude outsiders who held cross-directorships in previous years. So even though such provisions appear in other relationships, i.e. a former employee must wait for 5 years after the contract was terminated to be considered independent, they are ignored for cross-directorships.

When analysing the influence of a CEO's social network on firm accounting performance, we establish a significant negative relationship. The results are depicted in Table 5 below. Models 1 and 2 are, because of the endogeneity issues discussed above, reported for completeness only. Models 3-6 solve these issues. For both our measures of performance, ROE and ROA, and after using two different methodologies, 2SLS and a long-term measure of performance, we establish this negative impact of a CEO's social network on accounting performance. In conclusion, we find robust evidence in support of hypothesis 4. In other words, we find that well-connected CEOs do not use their ties to improve firm performance, i.e. in the interest of their shareholders. On the contrary, the effort they put into building their networks seems to harm the accounting performance of their firms. This result is supportive of the managerial power approach advanced by Bebchuk *et al.* (2002). Again, it challenges the very assumption under which firms hire well connected CEOs. To be certain that these results hold for both the high-growth, and more mature low-growth firms (as only high-growth firms have a particular preference for well-connected CEOs), we stratified our sample and in a second step analyzed high-growth firms in isolation. We were able to establish a negative, and for our long-term performance measure highly significant, impact of a CEO's social network on the performance of the company (untabulated results). This clearly shows that agency costs outweigh the benefits of a CEO's social network, and that even for this sub-group of high-growth companies' boards overestimate the benefits of social networks.

In line with our results on sales growth, we establish a significant negative impact of board independence on accounting performance. One possible explanation is that board independence leads to higher risk aversion of the firm, and indicates that the legislative push for higher board independence has unintended negative consequences for the firm. Another explanation is that independent outside directors are ineffective monitors.

(Insert Table 5 about here)

6. Conclusions and Discussions

This paper aims to establish whether in the market for CEOs it is ‘more important who you know than what you know’, and – in case such biased selection process exists - whether this is to the benefit or detriment of shareholders. In addition, we want to understand whether access to social networks is an important trait boards look for when choosing a new CEO. Unfortunately, the theoretical models do provide little guidance in this respect. While particular sociologists and organizational behaviour scholars regularly point towards the positive dimensions of social networks, economists and other scholars closely related to the field follow a more cynical view and argue that CEOs use their social network to extract private rents from the firm they manage to the detriment of shareholders.

In summary, our results appear to be at first sight contradictory as we find evidence in support of both theories. On the one hand, and in support of the agency theorists, we were able to establish that a CEOs large social network has a negative impact on accounting performance. Our results are both robust to different specifications and highly statistically significant, and are based on a innovative new measure of CEO ties, which takes into account the cumulative number of direct ties developed by a CEO during her corporate lifetime. The CEO seems to be able to extract private benefits to the detriment of shareholders, which is in support of Bebchuck’s *et al.* (2002) managerial power approach. The CEOs appear to use the power and security they gain from having access to a large social network for their own benefit rather than the benefit of the firm.

In addition, we find further evidence in support of the agency theorists, as firms with higher leverage appoint CEOs with a significantly smaller social network. In particular, the corporate finance literature established that debt acts as a credible disciplining device for managers, as it increases the likelihood of bankruptcy. Bankruptcies are costly for managers, as they have a considerable negative impact on their human capital (Tirole, 2006). For our case, this implies that boards expect less connected CEOs to be more focused and diligent, and also expect them to be better able to provide superior leadership to the firm in times of stress. In the trade-off between the

benefits of hiring a CEO with access to social networks or the benefits of a focused manager, pressured boards clearly value focus over access to social networks.

In contrast to our results on the impact on performance, we find that growth companies with high market-to-book ratios actively choose CEOs with access to a large social network. This result supports the sociologists, who point out the beneficial dimension of social networks for innovative high-growth companies. It seems that nomination committees believe that the benefits of having a well-connected CEO at the helm outweigh the associated agency costs. However, we were able to establish that even for high-growth companies, the CEO's access to social network has a negative impact on firm performance. In contrast, we do not find any evidence that a well-connected CEO would be able to increase the sales of the company. The above evidence leads us to believe that nomination committees seem to underestimate the agency costs of social networks, and in addition possibly overestimate the benefits of access to a social network in generating new growth possibilities.

The results on performance and leverage have important implications. Focusing for another minute on the issue of leverage, one possible explanation is that companies that are under pressure from the high debt burden are more likely to focus on exploitation of existing processes rather than exploration of new products and processes. This implies that exploration is only a viable strategy for firms that are not under stress, and so have the freedom of not being dependent on the payout of innovative projects. Rationally acting boards choose their CEOs accordingly. They select well-connected CEOs for innovative high-growth companies and less-connected ones otherwise. However, the significant negative impact of social networks on firm performance indicates that boards systematically overestimate the value of social networks when hiring a new CEO, or that the expected benefits never materialize as boards fail to monitor highly connected CEO adequately. Unlike research based on US and France data, we do not find any evidence that CEOs receive protection against dismissal from their social network. At this point, we can only speculate about how connected CEOs destroy value. It is not unreasonable to assume, though, that the costs of maintaining these social networks outweigh the benefits for the firm, with most of the benefits being accrued privately by the CEO (e.g. through higher social status). In conclusion, our results indicate that in the Karl Popper's tradition

of competition of theories, agency theory seems to be best suited to fit the data. They are winning the argument over the social network theorists.

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Table 1 Descriptive Statistics

This table presents the descriptive statistics of our sampled variables. These are presented for the whole sample as well as separately for FTSE-250 and FTSE Small Cap constituent companies. The last column provides information on the statistical significance of the mean differences between the two sub-samples. Networking is a cumulative variable calculating the direct ties the CEO has developed during her corporate lifetime. Career Path is a binary variable taking the value of one if the CEO's previous employment was within the same industry, zero otherwise. CEO Age shows the age of the CEO in calendar years. Tenure is the number of years the CEO has retained her current position. SOB is the size of the board, measuring the number of all directors sitting on the board. IOB is the independence of the board measure, which is calculated as the ratio of independent directors to board size. Duality is a dummy variable taking the value of one if the roles of CEO and Chairman are split, zero otherwise. Major Shareholders shows the number of shareholders with stakes in the company above the 3% threshold. Major Shareholdings shows the cumulative percentage of equity in the hands of the major shareholders. Market Value is the end of year market capitalization. Total Assets is the value of a company's assets for 2005. Leverage is the ratio of Total Debt to Total Equity and MtB is the ratio of Market to Book Value. Sales_1_yr_Growth shows the percentage growth in net sales during the year. The Return on Equity (ROE) and Return on Assets (ROA) annual figures are in percentages. Details on their calculation can be found in the paper (section 3). Obs. is the number of observations per category. Any variation in the number of observations is due to missing data.

<i>Variables</i>	Overall			FTSE 250			FTSE Small Cap			<i>Mean_Dif.</i>
	<i>Obs</i>	<i>Mean</i>	<i>Median</i>	<i>Obs</i>	<i>Mean</i>	<i>Median</i>	<i>Obs</i>	<i>Mean</i>	<i>Median</i>	
Networking	363	76.98	35	180	90.05	47.50	183	64.13	21	25.92**
Career Path (dummy)	363	0.78	1	180	0.80	1	183	0.76	1	0.04
CEO Age	351	50.85	51	174	51.30	52	177	50.41	50	0.89
Tenure (in years)	363	5.11	4	180	4.61	3	183	5.61	4	-0.99*
SOB	363	8.59	8	180	9.20	9	183	7.99	8	1.20***
IOB	363	0.54	0.56	180	0.56	0.57	183	0.53	0.50	0.03*
Duality (dummy)	363	0.92	1	180	0.95	1	183	0.90	1	0.05**
Major Shareholders (#)	345	5.44	5	169	5.07	5	176	5.79	6	-0.72***
Major Shareholdings (cumulative %)	343	38.50	39.50	169	33.79	31.6	174	43.06	44.90	-9.27***
Market Value (£ mil)	363	562	332	180	946	715	183	184	148	762***
Total Assets (£ mil)	361	656	305	178	1142	806	183	188	137	953***
Leverage	361	0.81	0.45	178	0.78	0.60	183	0.84	0.18	0.06
MtB	361	81.42	3.39	178	97.33	2.67	183	65.95	3.63	31.37
Sales 1 yr Growth (%)	357	20.11	8.32	176	14.75	8.04	181	25.34	8.68	-10.59
ROE (%)	344	18.86	15.15	170	26.30	17.33	174	11.59	12.28	14.71**
ROA (%)	361	6.17	6.72	178	8.26	6.94	183	4.15	6.40	4.11***

Table 2 Correlation Matrix

This table presents the correlation coefficients for all the variables used in this study. Networking is a cumulative variable calculating the direct ties the CEO has developed during her corporate lifetime. Career Path is a binary variable taking the value of one if the CEO's previous employment was within the same industry, zero otherwise. CEO Age shows the age of the CEO in calendar years. Tenure is the number of years the CEO has retained her current position. SOB is the size of the board, measuring the number of all directors sitting on the board. IOB is the independence of the board measure, which is calculated as the ratio of independent directors to board size. Duality is a dummy variable taking the value of one if the roles of CEO and Chairman are split, zero otherwise. Major Shareholders shows the number of shareholders with stakes in the company above the 3% threshold. Major Shareholdings shows the cumulative percentage of equity in the hands of the major shareholders. Market Value is the end of year market capitalization. Total Assets is the value of a company's assets for 2005. Leverage is the ratio of Total Debt to Total Equity and MtB is the ratio of Market to Book Value. Sales_1_yr_Growth shows the percentage growth in net sales during the year. The Return on Equity (ROE) and Return on Assets (ROA) annual figures are in percentages. Details on their calculation can be found in the paper (section 3). ROE_5y and ROA_5y are five year averages for ROE and ROA.

	Networking	Career Path	CEO Age	Tenure	SOB	IOB	Duality	Major Shareholders	Major Shareholdings
Networking	1.000								
Career Path	-0.220	1.000							
CEO Age	-0.069	0.009	1.000						
Tenure	-0.015	0.078	0.210	1.000					
SOB	0.195	0.019	0.110	-0.042	1.000				
IOB	0.103	-0.078	-0.060	-0.075	-0.240	1.000			
Duality	-0.011	0.023	-0.186	-0.202	0.093	0.096	1.000		
Major Shareholders	-0.033	0.148	0.031	0.100	-0.060	0.044	0.123	1.000	
Major Shareholdings	-0.076	0.119	0.017	0.048	-0.033	-0.102	-0.059	0.550	1.000
Market Value	0.213	0.004	0.094	-0.101	0.407	0.102	0.062	-0.225	-0.243
Total Assets	0.195	-0.039	0.093	-0.118	0.398	0.099	0.088	-0.215	-0.272
Leverage	0.016	-0.123	-0.004	-0.069	0.026	-0.042	0.067	-0.084	-0.071
MtB	-0.045	-0.083	-0.047	-0.055	-0.060	-0.012	0.038	0.096	0.105
Sales 1yr Growth	-0.079	-0.107	-0.032	0.051	0.008	-0.032	-0.203	-0.066	-0.072
ROE	-0.009	-0.046	0.018	-0.008	-0.112	-0.003	0.006	-0.148	-0.107
ROA	-0.024	0.048	0.074	0.095	-0.107	-0.092	-0.073	-0.130	-0.092
ROE_5y	-0.090	0.071	0.006	0.050	0.072	-0.050	-0.055	-0.063	-0.109
ROA_5y	-0.186	0.075	0.125	0.121	-0.013	-0.146	-0.099	-0.107	-0.083

Continued...

Continued...

	Market Value	Total Assets	Leverage	MtB	Sales 1yr Growth	ROE	ROA	ROE_5y	ROA_5y
Networking									
Career Path									
CEO Age									
Tenure									
SOB									
IOB									
Duality									
Major									
Shareholders									
Major									
Shareholdings									
Market Value	1.000								
Total Assets	0.799	1.000							
Leverage	0.092	0.188	1.000						
MtB	-0.039	-0.074	0.591	1.000					
Sales 1yr Growth	-0.027	-0.074	-0.068	-0.093	1.000				
ROE	0.073	-0.037	0.390	0.502	0.121	1.000			
ROA	0.122	-0.023	-0.031	0.057	0.159	0.449	1.000		
ROE_5y	0.169	0.112	0.027	-0.137	-0.008	0.417	0.358	1.000	
ROA_5y	0.114	0.056	0.025	-0.216	0.069	0.402	0.625	0.561	1.000

Table 3 CEO Networking Determinants

This table presents the regression results on the determinants of CEO networking. The dependent variable is CEO Networking, which is a cumulative variable calculating the direct ties the CEO has developed during her corporate lifetime. Career Path is a binary variable taking the value of one if the CEO's previous employment was within the same industry, zero otherwise. CEO Age shows the age of the CEO in calendar years. Tenure is the number of years the CEO has retained her current position. SOB is the size of the board, measuring the number of all directors sitting on the board. IOB is the independence of the board measure, which is calculated as the ratio of independent directors to board size. Duality is a dummy variable taking the value of one if the roles of CEO and Chairman are split, zero otherwise. Major Shareholders shows the number of shareholders with stakes in the company above the 3% threshold. Major Shareholdings shows the cumulative percentage of equity in the hands of the major shareholders. FTSE-250 is a binary variable taking the value of one (zero) if the CEO works for a FTSE-250 (FTSE Small Cap) company. Total Assets is the value of a company's assets for 2005. Leverage is the ratio of Total Debt to Total Equity and MtB is the ratio of Market to Book Value. We use the cumulative distribution function (CDF) to treat outliers, i.e. Networking, Total Assets, Leverage, MtB. In order to calculate CDF the observations for each variable are ranked; the ranks are transformed so that they lie uniformly between zero and one. Both models include industry dummies. Asterisks indicate significance at 10% (*), 5% (**) and 1% (***) levels. We calculate heteroskedasticity robust standard errors.

<i>Dependent Variable</i>	Predicted_sign	CDF_NW	
		(1)	(2)
Career Path	-	-	-0.182*** (-5.35)
CEO Age	+	-0.002 (-0.81)	-0.002 (-0.76)
Tenure	?	0.003 (0.99)	0.004 (1.28)
SOB	+	0.030*** (3.02)	0.029*** (3.18)
IOB	-	0.246*** (2.57)	0.217** (2.36)
Duality	-	-0.092 (-1.52)	-0.075 (-1.33)
Major Shareholders	+	0.001 (0.18)	0.005 (0.68)
Major Shareholdings	-	-0.001 (-1.00)	-0.001 (-1.05)
FTSE 250	+	-0.048 (-1.03)	-0.023 (-0.52)
CDF_Total Assets	+	0.486*** (4.77)	0.456*** (4.61)
CDF_Leverage	-	-0.130** (-1.99)	-0.144** (-2.26)
CDF_MtB	?	0.257*** (4.57)	0.252*** (4.65)
_cons		0.072 (0.38)	0.181 (1.01)
Industry Dummies		YES	YES
Observations		342	342
R ² (%)		31.97	38.14
F		5.18	7.26

Table 4 CEO Networking and Sales Growth

This table presents the regression results on the effect of CEO networking on sales growth. The dependent variable in model 1 is the unadjusted net sales growth for the year. The dependent variable in model 2 is the industry adjusted net sales growth for the year. The dependent variable in model 3 is a binary one, taking the value of one (zero) for above (below) industry average growth in net sales. CEO Networking is a cumulative variable calculating the direct ties the CEO has developed during her corporate lifetime. CEO Age shows the age of the CEO in calendar years. Tenure is the number of years the CEO has retained her current position. SOB is the size of the board, measuring the number of all directors sitting on the board. IOB is the independence of the board measure, which is calculated as the ratio of independent directors to board size. Duality is a dummy variable taking the value of one if the roles of CEO and Chairman are split, zero otherwise. Major Shareholders shows the number of shareholders with stakes in the company above the 3% threshold. Major Shareholdings shows the cumulative percentage of equity in the hands of the major shareholders. FTSE-250 is a binary variable taking the value of one (zero) if the CEO works for a FTSE-250 (FTSE Small Cap) company. Total Assets is the value of a company's assets for 2005. Leverage is the ratio of Total Debt to Total Equity and MtB is the ratio of Market to Book Value. We use the cumulative distribution function (CDF) to treat outliers, i.e. Sales, Networking, Total Assets, Leverage, MtB. In order to calculate CDF the observations for each variable are ranked; the ranks are transformed so that they lie uniformly between zero and one. Both models include industry dummies. Asterisks indicate significance at 10% (*), 5% (**) and 1% (***) levels. We calculate heteroskedasticity robust standard errors. Any variation in the number of observations is due to missing data.

<i>Dependent Variable</i>	<i>CDF_Sales Growth (1 year)</i>	<i>CDF_Sales Growth (1 year - Industry adjusted)</i>	<i>Sales Growth (1 year - dummy)</i>
CDF_NW	-0.061 (-1.00)	-0.079 (-1.23)	-0.117 (-1.08)
CEO Age	-0.004* (-1.69)	-0.001 (-0.32)	-0.002 (-0.48)
Tenure	0.007** (2.25)	0.003 (0.98)	0.004 (0.83)
SOB	0.007 (0.78)	-0.006 (-0.57)	-0.007 (-0.44)
IOB	-0.150 (-1.44)	-0.232** (-2.24)	-0.456** (-2.41)
Duality	-0.111 (-1.55)	-0.042 (-0.57)	-0.024 (-0.20)
Major Shareholders	0.005 (0.69)	-0.009 (-1.09)	-0.016 (-1.14)
Major Shareholdings	-0.003*** (-2.62)	-0.001 (-1.24)	-0.002 (-1.20)
FTSE 250	0.143*** (3.07)	0.086* (1.72)	0.123 (1.42)
CDF_Total Assets	-0.326*** (-2.84)	-0.109 (-0.89)	-0.178 (-0.85)
CDF_Leverage	0.024 (0.38)	-0.007 (-0.11)	-0.097 (-0.83)
CDF_MtB	-0.026 (-0.40)	-0.085 (-1.30)	-0.069 (-0.60)
_cons	1.005*** (5.68)	0.950*** (5.13)	1.180*** (3.75)
Observations	338	338	342
R ² (%)	10.96	6.92	6.37
F	3.98	2.35	1.93

Table 5 CEO Networking and Accounting Performance

This table presents the regression results on the impact of CEO networking to firm accounting performance. The dependent variable is performance, measured by either ROE or ROA and/or their five year averages. CEO Networking is a cumulative variable calculating the direct ties the CEO has developed during her corporate lifetime. CEO Age shows the age of the CEO in calendar years. Tenure is the number of years the CEO has retained her current position. SOB is the size of the board, measuring the number of all directors sitting on the board. IOB is the independence of the board measure, which is calculated as the ratio of independent directors to board size. Duality is a dummy variable taking the value of one if the roles of CEO and Chairman are split, zero otherwise. Major Shareholders shows the number of shareholders with stakes in the company above the 3% threshold. Major Shareholdings shows the cumulative percentage of equity in the hands of the major shareholders. FTSE-250 is a binary variable taking the value of one (zero) if the CEO works for a FTSE-250 (FTSE Small Cap) company. Total Assets is the value of a company's assets for 2005. Leverage is the ratio of Total Debt to Total Equity and MtB is the ratio of Market to Book Value. We use the cumulative distribution function (CDF) to treat outliers, i.e. ROE, ROA, ROE_5y, ROA_5y, Networking, Total Assets, Leverage, MtB. In order to calculate CDF the observations for each variable are ranked; the ranks are transformed so that they lie uniformly between zero and one.

We apply three different methodologies/specifications. Models 1 and 2 use ordinary least squares (OLS) regression to test the contemporaneous relationship between performance and networking. Models 3 and 4 use two-stage least squares (2SLS) regression, whereas models 5 and 6 use OLS but now the dependent variable is long term performance. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***) levels. We calculate heteroskedasticity robust standard errors. Any variation in the number of observations is due to missing data.

Note: When using the 2SLS method Stata suppresses the R^2 when they are negative. At any rate, the R^2 has no statistical meaning in the context of 2SLS/IV and a negative R^2 does not mean that our parameter estimates are weak.

Method	OLS_Contemporaneous		2SLS		OLS_Long Term Performance	
	<i>CDF_ROE</i>	<i>CDF_ROA</i>	<i>CDF_ROE</i>	<i>CDF_ROA</i>	<i>CDF_ROE5y</i>	<i>CDF_ROA5y</i>
	(1)	(2)	(3)	(4)	(5)	(6)
CDF_NW	-0.036 (-0.61)	-0.080 (-1.33)	-1.058*** (-3.15)	-1.561*** (-3.86)	-0.153** (-2.15)	-0.192*** (-2.79)
CEO Age	0.003 (1.21)	0.003 (1.07)	-	-	-0.002 (-0.61)	-0.001 (-0.37)
Tenure	0.001 (0.54)	0.004 (1.49)	-	-	0.005* (1.79)	0.007*** (2.83)
SOB	-0.014* (-1.76)	-0.015* (-1.72)	-	-	0.003 (0.32)	0.016 (1.56)
IOB	-0.235** (-2.45)	-0.194** (-1.93)	-	-	-0.394*** (-3.35)	-0.265** (-2.29)
Duality	-0.014 (-0.27)	-0.076 (-1.35)	-	-	-0.097 (-1.36)	-0.113 (-1.59)
Major Shareholders	-0.004 (-0.53)	-0.001 (-0.18)	-0.005 (-0.44)	-0.001 (-0.10)	0.009 (0.95)	0.008 (0.92)
Major Shareholdings	-0.003*** (-3.20)	-0.003*** (-2.85)	-0.004*** (-2.67)	-0.004** (-2.23)	-0.003** (-2.12)	-0.003** (-2.40)
FTSE 250	0.143*** (3.10)	0.198*** (3.84)	0.090 (1.31)	0.108 (1.28)	0.221*** (3.98)	0.253*** (4.93)
CDF_Total Assets	-0.123 (-0.95)	-0.285** (-2.01)	0.443* (1.68)	0.557* (1.77)	-0.189 (-1.23)	-0.340** (-2.87)
CDF_Leverage	-0.048 (-0.60)	-0.146* (-1.85)	-0.199* (-1.71)	-0.375*** (-2.80)	-0.030 (-0.34)	-0.035 (-0.46)
CDF_MtB	0.345*** (4.35)	0.089 (1.20)	0.612*** (4.59)	0.465*** (3.00)	-0.059 (-0.69)	-0.222*** (-3.23)
_cons	0.764*** (6.19)	0.855*** (5.10)	0.853*** (5.81)	1.139*** (6.13)	1.027*** (5.64)	1.046*** (5.75)

Industry Dummies	YES	YES	YES	YES	YES	YES
Observations	329	342	329	342	278	298
R ² (%)	37.30	31.88			39.98	41.99
F	7.65	7.27			5.88	5.62

Appendix 1

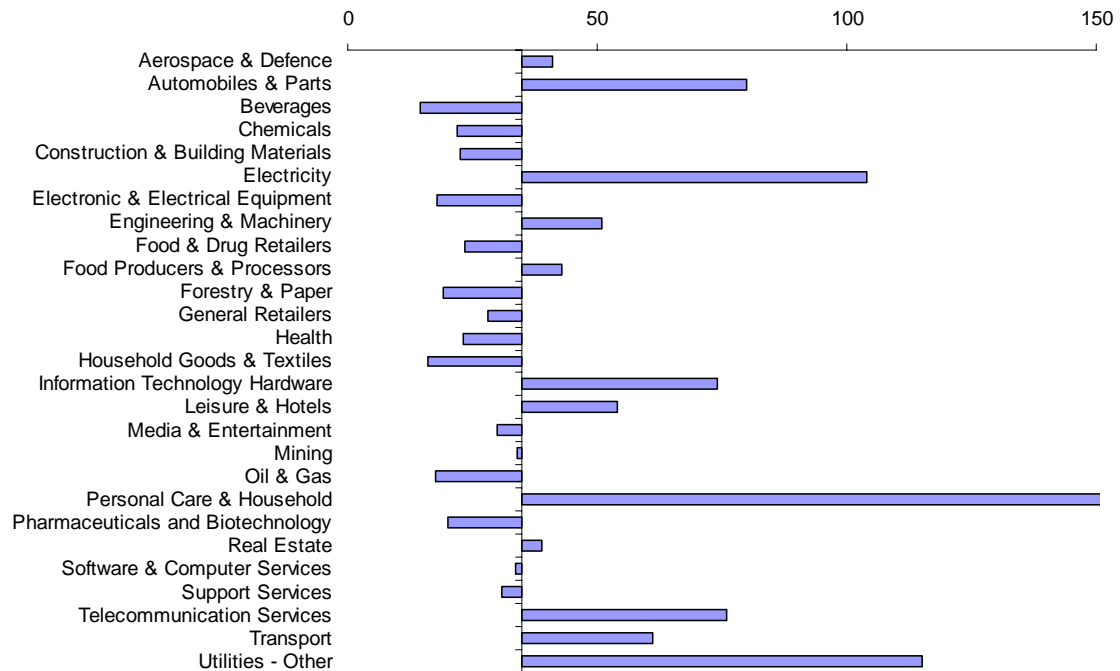
Number of Firms in Sample per Industry

Industry	Number of Firms	Percentage
Aerospace & Defense	8	2.20%
Automobiles & Parts	6	1.65%
Beverages	2	0.55%
Chemicals	5	1.38%
Construction & Building Materials	28	7.71%
Electricity	1	0.28%
Electronic & Electrical Equipment	14	3.86%
Engineering & Machinery	21	5.79%
Food & Drug Retailers	2	0.55%
Food Producers & Processors	9	2.48%
Forestry & Paper	1	0.28%
General Retailers	31	8.54%
Health	11	3.03%
Household Goods & Textiles	6	1.65%
Information Technology Hardware	11	3.03%
Leisure & Hotels	19	5.23%
Media & Entertainment	26	7.16%
Mining	3	0.83%
Oil & Gas	14	3.86%
Personal Care & Household Products	2	0.55%
Pharmaceuticals and Biotechnology	11	3.03%
Real Estate	21	5.79%
Software & Computer Services	28	7.71%
Support Services	56	15.43%
Telecommunication Services	7	1.93%
Transport	19	5.23%
Utilities - Other	1	0.28%
Total Firms/Percentage	363	100.00%

Appendix 2

CEO Networking per Industry

This figure depicts the industry variation of CEO networking. We use median values since the CEO networking variable is skewed. The horizontal axis shows the number of CEO direct ties. The vertical axis crosses the horizontal at the median value of the overall sample (35 ties). The industries depicted on the left (right) of the vertical axis have median values below (above) the overall median.



Appendix 3

Career Path per Industry

This figure depicts the industry variation of CEO Career Paths. We use average values since the CEO Career Path variable is a binary one. The horizontal axis shows the average number of CEO career paths. The vertical axis crosses the horizontal at the average value of the overall sample (0.78). The industries depicted on the left (right) of the vertical axis have average values below (above) the overall mean.

