Renneboog L, Zhao Y. [Us knows us in the UK: On director networks and CEO compensation](#). *Journal of Corporate Finance* 2011, 17(4), 1132-1157.

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DOI link to article:

<http://dx.doi.org/10.1016/j.jcorpfin.2011.04.011>

Date deposited:

08/02/2018

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Us Knows Us in the UK: On Director Networks, Managerial Power, and CEO Compensation

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PRELIMINARY: DO NOT QUOTE

Abstract

This paper examines the relationship between CEO compensation and networks of executive and non-executive directors and is based on a sample of virtually all – 2991 - listed UK companies over the period 1996 to 2007. Networks may be an important informal corporate governance device. We analyze whether networks are built for reasons of information gathering or for the accumulation of managerial power. We capture the networks based on director interlocks and investigate these professional networks on both the director and company level. We find that direct networks are created for managerial power accumulations, that indirect networks can be used for information collection, and that both network types enable the CEO to obtain a higher compensation. However, only stronger managerial power networks harm the efficiency of the remuneration schemes in that the performance sensitivity is lower. Our networks on the company level gives evidence of busy boards which may reduce directors' monitoring effectiveness. Our unique dataset also provides detailed information about the role of remuneration consultants: hiring experienced remuneration consultant with large client networks leads to higher CEO compensation in larger firms.

Keywords: Executive remuneration, Social networks, Corporate Governance, Remuneration consultants.

JEL codes: G3, J3, L14.

1. Introduction

"The practice of interlocking directorates is the root of many evils. It offends laws human and divine." ... "Applied to corporations which deal with each other it tends to disloyalty and to violation of the fundamental law that no man can serve two masters. In either event it tends to inefficiency; for it removes incentive and destroys soundness of judgment. It is undemocratic for it rejects the platform: 'A fair field and no favors' " (Louis Dembitz Brandeis, 1914)¹

Social networks govern our lives; they are established through common education, sports interests, club memberships, as well as connections resulting from our professional lives. The economics and finance literature has started to give attention to the influence of managers' and non-executive directors' connections on corporate decision making and corporate monitoring. Indeed, it may be that *informal aspects of corporate governance* through social networks have a bigger impact on corporate policy than we anticipated and even influence the functioning of institutionalized governance structures (such as boards of the directors) or the role of governance regulation.

Recent research shows that networks permeate the efficiency of economic decision making. For instance, Seidel, Polzer and Stewart (2000) document social ties' strong impact on the wage negotiations of members of minorities. The discriminating effect against minority groups in the recruiting process of US high-tech companies is dramatically reduced when minority members are referred to the firm through a connection working in the company. Educational networks of mutual fund managers seem to influence their investment decisions (Cohen, Frazzini and Malloy, 2008a): they are more likely to invest in firms managed by people who had studied at the same university and the investment in connected firms performs better. Cohen, Frazzini and Malloy (2008b) document the impact of sell-side analysts' social networks on their ability of collecting superior information. They find that analysts perform better on their

¹ Brandeis was Associate Justice on the US Supreme Court and made this statement before the passing of the Clayton Act (1914) which prohibited extensive director networks that as these could lead to collusion in concentrated industries. The quote appeared in the US House of Representatives Staff Report to the Antitrust Committee (1965:3).

stock recommendation if they have education connections with the company's directors. Hochberg et al. (2007) conclude that venture capital (VC) funds' performance is positively affected by the influence of the network positions enjoyed by the VC's parent firms. Whereas these papers are examples of the benefits of social networks, networks may also have a detrimental effect on corporate decision making. For instance, Kuhnen (2009) identifies the effect of a fund's director social network on the hiring and contracting decision of advisors to US mutual funds. If the candidate advisor was connected to the fund's director through past business relationships, he/she was more likely to be appointed and paid a higher management fee. The fact that returns of funds with advisors connected to the board of directors are significantly lower than the returns of funds without connections raises the question whether close connections are raising agency costs in corporate governance or not.

This paper examines the *role of director networks on the top manager's compensation and the pay-setting process* in the UK. It is important to note that, we will use the UK definition of a director who can be either an executive (manager, officer) or a non-executive director.² Over the past 15 years, executive compensation has increased substantially at a pace significantly above inflation and above salary increases of employees. This phenomenon continued even during the recent financial crisis which caused the S&P's 500 stock index to fall by 37.6% in 2008 when 75% of the CEOs in the 2700 largest US companies received remuneration increases. Even in companies at the brink of bankruptcy, departing CEOs managed to enjoy huge severance package. One example is Angelo Mozilo who was the CEO of Countrywide Financial that was saved by the Bank of America in June 2008, and was given \$188 million as a send-off package. And this event was not an exception³. In spite of academic doubts over the last decade about the efficiency of the remuneration contract design (Bebchuk and Fried, 2003), the

² Executive directors are members of the board and exert a senior management position in the company (in the US, they would usually be called officers). The non-executive directors (in the US often called directors) are board members who are not involved in the daily management; they often are managers or bankers in other firms.

³ Lesser examples includes Kerry Killinger, the ex-CEO of Washington Mutual, who departed with \$44 million in September when his company failed; Mack Whittle, who successfully left South Financial group with \$18 million gold parachute several days before the company applied for federal loans, which would limit the executive pay.

public debate on top management remuneration only flares up in times of crises such as the corporate governance/accounting disclosure crisis of 2000-2003 and the recent financial crisis that started in 2007. Each time, the top management remuneration practices were blamed to provide flawed incentives (Hill 2006) inducing short-sighted corporate strategies, but curbing the remuneration practices has proven difficult as soon as the outrage toned down.

The arguments from industry against curtailing managerial pay are usually that attracting talent necessitates adequate compensation as firms would otherwise lose their competitive edge. *“We’re a very big bank, we employ 200,000 people around the world [...]. We have obviously got to pay our people appropriately. I think our customers will appreciate that people deserve a fair wage”* (Defiant bank gives its fat cats GBP 1.6 billion bonuses, 2010 (Express.co.uk)). This is indeed the key question: is it the competitive market for managerial talent that sets the compensation contract or is the contracting process hijacked by the executive directors? In order to provide an (partial) answer this question we study the impact of the social networks of executive and non-executive directors while controlling for the traditional explanations of managerial pay and the pay-for-performance sensitivity such as shareholder control and board composition. Networks may be very valuable to the firm, which is hence reflected in the directors’ compensation for the following reasons: First, connections with (peer) companies through directorships enable a firm to gain access to business information prior to its public disclosure. Such information is especially interesting when a firm is planning strategic alliances, merger and acquisitions, expanding into new markets. Early notice of critical business changes allows the company to reconsider and adjust their own strategy in time. Second, directors with strong networks are or develop into reputable figures in the society with access to politicians, employers’ organizations, regulators. Third, a network may also reflect managerial talent and a director’s past business successes in other firms. Thus, a large network reflects a director’s reputation and can be viewed as the guarantee of an executive director’s quality to the firm interested in hiring him. So, for all these reasons, directors’ connections are valuable for a firm and may translate into higher compensation and/or different structures of compensation contracts.

Key is that the value of a director to a company depends on the informational advantage of the number and importance of these connections (reputation). Therefore, a company that is better connected may be able to pay its executive and non-executive directors better. We therefore call the positive relation between social networks on the firm and the individual director level and remuneration: the *information-value hypothesis*.

From the examples on pay excesses given above, it has become clear that remuneration contracting may not be a mean to reduce agency problems but be turned into an agency problem itself if the remuneration contracting is controlled by the top management. Networked executive directors may accumulate more power and may establish a stronger negotiation position vis-à-vis the board (and the remuneration committee) such that executive directors are able to extract a more attractive compensation package. We label this relation the *managerial power hypothesis*.

While several recent papers, such as Guedj and Barnea (2009) and Horton et al. (2009), relate pay to networks, this paper contributes to the network literature because of these strengths. First, we are able to distinguish between the managerial power hypothesis, which claims that CEOs set their own pay, and the information-value hypothesis, which states that connected CEOs deserve higher compensation because of the information-value of their social networks. We distinguish between the two hypotheses by calculating measures of *direct links* (which proxy for managerial power) and *indirect links* (which mainly capture the potential of executives to collect information). Furthermore, we calculate the strength of networks at the *individual* director level and at the *company* level. Second, in addition to the degree and (normalized) closeness measures used in the literature, we employ (normalized) betweenness and eigenvector centrality to capture different aspects (such as the direct and indirect nature) of networks. Third, whereas most papers on networks employ cross-sectional data or data on a subset of companies (which hampers the concept of network measurement), we have gathered a large data panel consisting of virtually all listed UK companies for a 12 year period (1996-2007), amounting to firm years. Fourth, we control for the role of networks of remuneration consultants as well as internal and external corporate governance devices

(shareholder voting concentration, board structure and composition, CEO characteristics and corporate performance.

Our empirical analysis based on random effect model generates several insightful results: First, we use direct centrality measure to capture managerial power resulting from director networks. We find indeed that higher direct centrality scores on the CEO level explain the CEO's larger compensation packages and lower sensitivity, which supports our managerial power hypothesis. We use indirect centrality measures to evaluate the CEO's access to information and resources valuable to his company. The indirect networks are translated into larger remuneration for the CEO but do not have an impact on his pay-for-performance sensitivity.

Second, on the company level, we use the direct centrality measures to test the busy board hypothesis. Our results are in line with the hypothesis that companies with a higher direct centrality score (which signifies that directors are active in other firms and may hence be less effective monitors of the firm) over-pay their CEOs. Likewise, indirect centrality measures capture the company's access to valuable information and resources. We find companies with better information access pay out a lower compensation to the CEO.

Third, we also investigate whether the relations between performance measures and CEO compensation is influenced by the centrality measures of the CEO and the company. Our result shows the direct (managerial power) centrality score lowers the pay-for-performance sensitivity on both the CEO level as well the company level. While the indirect measures (information collection) do not influence the sensitivity. This provides further support for the managerial power hypothesis.

We have controlled the centrality-CEO compensation relation for many CEO, board and company characteristics. For instance, we confirm that there are conflicts of interest when a CEO is a member of the remuneration committee because his compensation is then significantly higher. The size of the remuneration consultant network increases CEO

compensation, especially in large firms. The proportion of non-executive directors and female directors increase CEO total compensation

This paper is organized as follows. Section 2 discusses the literature and formulates the hypotheses. Section 3 describes how networks are measured and calculates the centrality measures. Section 4 shows the methodology and summarizes the summary statistics. Section 5 discusses the results while section 6 expands on the robustness checks. Section 7 concludes.

2. The literature and hypotheses

2.1 Social Network hypotheses

The optimal remuneration contracting view has been challenged by the rapid increase in managerial compensation and the lack of pay-for-performance. A CEO can influence his remuneration contract when he can exert power on the board, when directors are on each others' remuneration committees which could lead to collusion, when non-executive directors are nominated by a dominant CEO whom they cannot oppose, when shareholder ownership concentration is weak. We study this managerial power (Bebchuk, Fried and Walker, 2002) or skimming (Bertrand and Mulainathan, 2001) view on compensation contracting, and focus – while controlling for shareholder control (Mehran, 1995) and board effectiveness (Yermack, 1996) – on the role of the influence of and interaction between executive and non-executive directors, in other words their social networks. In their theoretical paper, Conyon and Read (2006) model the relation between multiple directorships and shareholder value. While the authors recognize that accepting outside directorships can be beneficial for the firm as outside directorships can bring in skills, knowledge and experience, which may outweigh the opportunity cost, executive directors will opt for more outside directorships than what is optimal for their own company.

The question is whether we can distinguish between networks that yield managerial power and those who are valuable in terms of information collection. We therefore focus first on (normalized) centrality measures of the direct connections: the degree and

eigenvector centrality which capture the power of the directors (the links of vertices in the local region of the graph) (details on the calculation are given below). We hypothesize that:

H1 *CEOs with stronger networks (measured by direct links) can exert managerial power reflected in higher total compensation and compensation packages that are less performance sensitive (managerial power hypothesis). The value of the 'managerial power' networks declines in the presence of a board with more non-executive directors and of stronger shareholder power.*

Guedj and Barnea (2009) calculate the core centrality measures and show that CEO salary augments with the network size while controlling for corporate governance measures, CEO characteristics, and industry fixed-effects. This result supports their reputation hypothesis: when directors are connected, they soften their monitoring of the CEO, which leads to CEO compensation increases. This is also in line with the essence of the managerial power argument. Kirchmaier and Kollo (2007)'s research is conducted on outside directors on a small sample of the largest UK firms. Well-connected outside CEOs have better chance to be appointed, and their compensation is higher, mostly driven by the larger proportion of equity-based part. Brown et al. (2009) measure the networks of a large cross-section of UK companies and broaden the (current and past) professional network by connections through education, social activities (golf club, charity organizations, etc). They find a positive relation between CEO social network centrality and total compensation and an inverse relation between centrality and pay-for-performance sensitivity, which also corroborates the managerial power hypothesis. Larcker et al. (2006) present an analysis with new director network measurements. They develop network measures to distinguish between friendly links and independent connections. They show that short friendly links are positively related to CEO compensation but that operating performance is negatively correlated with director connections. This also is in line with the managerial power hypothesis.

Director networks can have many advantages at the level of information collection. Early access to information can give a company a competitive advantage. Such networks may

enable firms to develop effective strategies to build strategic alliances, attract new sources of financing, influence regulation. Therefore, we expect that the value of these networks is reflected in the value of the compensation and its composition. The value of connectedness in terms of information can be measured by the centrality measures: (normalized) closeness and betweenness. The former captures how close a director (vertex) to all other vertices. The latter measures or how frequently a vertex is on the geodesic (shortest) path between any other pair of vertices. Once information emerges and spreads over the paths in the director networks, a director with a high closeness and betweenness has high information collection ability (for details: see section on centrality measures). We hypothesize:

H2 *CEO compensation increases with his access to information as approximated by his network centrality defined on indirect links. The value of this information-network is reflected in a higher compensation and higher pay-for-performance sensitivity (information-value hypothesis). The value of the information-driven network declines is independent of a board with more non-executive directors and of stronger shareholder power.*

Crespi-Cladera and Pascual-Fuster (2008) analyze the correlation between executive director's pay and the network activity in a unique dataset of Spanish companies in the electronic sector. Not only closeness positively affects director compensation but so does betweenness. So, the authors provide some evidence that CEO compensation also reflects the information collection value of networks. Likewise, Horton, Millo and Serafeim (2009) calculate closeness and the dyadic constraint and find that executives' network centrality is positively associated with their compensation. Executives seem to be rewarded for the resources they bring to a firm through their networks, while non-executive directors whose connections are more constrained earn higher compensation since their relative isolation may be perceived as an indication of their independence and superior monitoring capabilities.

We can also calculate networks at the company level instead of the director level, in which case we examine the links between companies (through their directors). If the

company has a strong network, it may be less well run as non-executive directors may be less time to spend effort on monitoring their firm and the executive directors' focus is dispersed. (Fich, and Shivdasani, 2006; Malmendier and Tate, 2009) Consequently, the governance of companies with many direct links may be deficient which may lead to a non-optimal compensation contract. Hallock (1997) analyses mutual interlocks between firms through employee and CEO connections. He demonstrates concludes that CEOs of interlocked companies earn on average a significantly higher basic salary and bonus than non-interlocked ones. He concludes (as do Fich and White, 2002) that board interlocks harm corporate governance efficiency and result in high CEO compensation. We therefore hypothesize:

H3 *In companies with a strong network by means of many direct links, the CEO's total compensation is higher with a lower pay-for-performance sensitivity (busy board hypothesis).*

If the company as a whole has good access to information throughout its directors' networks based on indirect links and does not depend on the CEO's network alone, there is no need to remunerate the CEO for his network such that we expect:

H4 *The company network information collection based on the indirect links of its directors negatively affects the size of CEO compensation package and improves the pay-for-performance sensitivity.*

2.2 Controlling for other determinants of CEO compensation

Besides the directors' networks, CEO compensation may be jointly determined by corporate performance, the role of remuneration consultants, specific CEO characteristics such as tenure, board composition, the ownership concentration by shareholder type, and some other characteristics such as firm size or industry.

Remuneration consultants

Remuneration consultants have the best access to remuneration information in current market and may hence be influential in setting the remuneration policy of specific companies but even of an industry if their advice is implemented in their network of clients. Through its remuneration consultant, a firm A may gain access has access to the remuneration practice in his peer companies. The impact of hiring a remuneration consultant on the remuneration policy of firm A can be twofold. A sudden increase in the remuneration in a firm B belonging to a specific remuneration consultant's network of clients may be quickly copied to the other clients (including A) of the consultant who hence spreads the information on the raising of the remuneration benchmark (as applied in B). In contrast, remuneration consultants may advice that the remuneration package be based on objective standards and benchmarks such which attenuates the upward spiral in compensation. Recent analyses seem to support that remuneration consultants are driving compensation up: Conyon, Peck and Sadler (2009), who investigate the compensation consultants and executive pay in the US and the UK, conclude that CEO compensation is indeed larger and includes more equity-based compensation when a remuneration consultant is hired. Kabir and Minhat (2010) go one step further and report that CEOs' equity-based compensation in the UK linearly increases the more remuneration consultant a firm hires. Moreover, the more market share these remuneration consultants have, the higher the CEOs' remuneration in the firms they advice. The authors conclude that competition between remuneration consultants drives executive compensation up.

CEO characteristics

A CEO with a longer *tenure* is likely to obtain a higher remuneration package to compensate him for his company-specific human capital. Furthermore, his long experience may also make him more competitive on the managerial labour market (Murphy, 1986). CEOs with long tenure may be more entrenched and thus have more influence on their remuneration. This will be especially the case if he has a longer tenure than most non-executive directors and if he has served on compensation and remuneration committees. We use the CEO's *age* to proxy CEO for his overall experience (possibly acquired on several companies). Thus, we expect that older CEOs and CEOs with longer tenure receive higher pay.

Only rarely, women are leading listed companies: *female* top managers occupy only 3-5% of the (executive) board seats in listed US and the UK firms. Apart from evidence of a glass ceiling, women managers also seem to be discriminated against in terms of salary. For instance, Bertrand and Hallock (2001) find the female top executives are earning 45% less than their male colleagues in large American companies. Kulich et al. (2010) confirm that only 3% of the executive board members are female in all listed firms in the UK and they receive a lower remuneration than their male counterparts. In addition, their compensation contracts also differ from that of their male counterparts: female managers' remuneration packages are less performance sensitive as their compensation has less upward potential in case of good corporate performance but they lose less in case of poor performance.

Although *combining the functions of CEO and chairman* are discouraged in the current UK Combined Code, we still find many such cases, though predominantly in small and medium-sized companies. We expect that CEOs who also assume the tasks of a chairman have higher remuneration to compensate him for the extra task but also because this CEO will be in a more powerful position vis-à-vis the other (non-executive) directors (Conyon and Peck, 1998). The conflicts of interest even augment when the CEO is also a *member of the nomination committee* which allows him to appoint friends as new board members or when he is a *member of the remuneration committee*. We also control for the notice period included in the CEO's employment contract. This lowers the level of total compensation needed to attract the CEO.

Board characteristics

Board composition has often considered as one of the critical measure for corporate governance effectiveness. A high *proportion of nonexecutive directors*, *separation of the tasks of CEO and chairman*, the creation of *committees* are expected to be important to turn the board into an effective governance device but the effectiveness of the board has not been overwhelming (Mehran, 1995). For instance, Franks, Mayer and Renneboog (2001) find that non-executives seem to support the executive directors in the UK even in

the wake of poor performance. Core, Holthausen and Larcker (1999) confirm the hypothesis on the negative relation between higher CEO pay and board independence. More recent research for the US by Chhaochharia and Grinstein (2008) indicates that CEO compensation decreases in firms that comply with the new and stricter board structure regulations imposed on listed firms by the NYSE and NASDAQ in 2002-03. In our regression analysis, if the company has a larger percentage of nonexecutives on the board, we expect the excessive CEO compensation can be restrained.

Share stake concentration

A key aspect of corporate governance is the monitoring role exerted by major shareholders (Core et al., 1999). The *executive directors owning shares* in their firm will have better their interest more aligned with those of the other shareholders which may lead to more modest compensation packages. This will also be the case with *major share blocks held by non-executive directors* (whose fiduciary obligations to monitor are now enhanced by voting power) and *by outside shareholders* such as corporations, individuals and families and institutional investors. Given that most blockholders belonging to the last category are rather passive owners, we expect their presence to have little effect on setting the CEO compensation. Corporations and individuals owning major blocks are expected to curb compensation (Bertrand and Mullainathan, 2001).⁴

Firm characteristics

Company size has been shown to explain most of the cross-sectional variation in total managerial compensation (Murphy, 2000; Core et al., 1999). Larger companies are paying their CEOs substantially more than medium-sized and small companies as it takes specific (and rare) managerial talent to lead large corporations which also entails larger responsibilities. Therefore, we also expect CEO compensation increases with firm size.

Including *corporate performance*-related incentives in the remuneration contracts is key in the classic principal and agent frame work (Grossman and Hart, 1983). Neither

⁴ Conyon and Muldoon (2008) measure networks of shareholders and find the evidence shows that the ownership and control world is small in the sense that the geodesic path length is small compared to the number of vertices in the largest connected component.

accounting nor stock market performance measures are perfect benchmarks. The former are backward looking and are liable to manipulation by the management in order to augment their bonus compensation (Healy, 1985, Bergstresser and Philippon, 2006). Although employing stock prices as the yardstick has the advantage of a focus on (future) value creation, this may induce a biased short-term focus. Frequent overvaluation and undervaluation due to market sentiment may enable management to take decisions that cater to this sentiment while aiming at maximizing variable pay. Hence, we will use both types of performance measures in our models. Bertrand and Mullainathan (2001) and Renneboog and Trojanowski (2005) show that the benchmarks chosen in the remuneration contracts depends on the relative power of the management; they claim that management without principals prefers accounting benchmarks and is frequently not remunerated for their intrinsic quality but is paid for luck. Therefore, we expect that the CEO total compensation, salary, bonus and equity-based compensation are sensitive to the company's performance, measured by both accounting and stock market performance.

It may take a CEO with specific human capital to manage a firm with a high level of *riskiness*. A risk-averse CEO may demand a higher remuneration or a pay-for-performance relation embedded in the contract to compensate him for managing a firm with more volatile cash flows or with a higher probability of entering into financial distress. Therefore, we collect data on stock price

3. Capturing Networks

3.1. The network definitions

To quantify directors' networks, we resort to several graph-theoretical measures. Figure N1 depicts the director network surrounding Andy Hornby, the CEO of HBOS plc, a banking and insurance company. Directors in HBOS plc are the dark grey circles at the right bottom corner. In 2006, Andy Hornby was also a non-executive director in the life assurance and unit trust company St. James's Place plc (whose board members are

represented by light grey circles at the top right corner), and in the retail companies GUS plc and Home Retail Group plc⁵ (whose directors are in dark and light circles in the left bottom corner). This example is a fragment of a complete director network whereby a director is denoted by a *vertex* (or node). A connection between two vertices is called *link* (or edge, tie). The system contains vertices and links between them is a *graph* (or map). As links between two vertices are established when two directors are sitting on the same board, Andy Hornby's four directorships create connections with 38 directors. Besides Andy Hornby, HBOS and St. James's Place shared another two directors: Jo Dawson and James Crosby. Jo Dawson was an executive director in HBOS and a non-executive director in St. James's Place. James Crosby was the CEO in HBOS before Andy Hornby and a non-executive director. Similarly, GUS and Home Retail Group shared three directors, Oliver Stocken, John Coombe and Terry Duddy. Oliver Stocken was a non-executive director in GUS and became chairman of the board in Home Retail Group. John Coombe used to be a nonexecutive director in GUS and became senior nonexecutive director in Home Retail Group. Terry was an executive director in GUS and the CEO in Home Retail Group.

[Insert Figure N1 about here]

A sequence between two vertices, visiting no vertices more than once, is called a **path**. In the above graph, there exist multiple paths between John Peace and Richard Ashton. For example: Peace – Duddy – Ashton, Peace – Stocken – Ashton, Peace - Coombe – Hughes – Ashton and etc. The length of a path is the number of links it comprises and a *geodesic path* is the shortest path between two vertices (which is not necessarily unique). The length of the geodesic path is the graph-theoretical distance (the number of links in the geodesic path). In the above example, both Peace – Duddy – Ashton and Peace – Stocken – Ashton are paths with length 2. As is no path between Peace and Ashton with distance smaller than 2, both paths with length 2 are geodesic paths. In contrast, the path Peace - Coombe – Hughes – Ashton has a distance of 3, and is hence not a geodesic path.

⁵ GUS plc split into Home Retail Group plc and Experian plc in 2006. Therefore, the two companies in the left bottom corner were not completely independent from each other.

Another concept is a *step*. Duddy and Stocken are one step away from Peace, while Ashton and Hughes are two steps away from Peace. In Figure N1, the vertices have circles of different sizes, which are determined by the number of connections (which is also called the *degree*). This number of links possessed is one of the most common measures to evaluate how central the director is in the graph.

3.2 Measures of Centrality

In order to illustrate the calculation of various centrality measures, we construct a network (Figure N2) with six companies and ten directors in the table below where the number refers to the name of the firms and the letter stands for the directors' names (Table N1, Panel A). If two directors are sitting on the same board, they are linked, which is expressed in Figure N2. In order to compute the centrality measures, we represent the network as a symmetric matrix, where 1 denotes a link between the two directors and 0 does not (Panel B). This matrix enables us to calculate the centrality measures which are summarized in Panel D.

[Insert Figure N2 and Table N1 about here]

The *degree* centrality of a vertex is calculated as the number of links of vertex. In the above example, the number of links for vertex is 6, so director A has degree centrality of 6 (as can be seen from Panel A of Table N1). The degree centrality can also be normalized by dividing the number of links by the total network size (the total number of vertices in graph with exception of the vertex A).

The *closeness* of a vertex is defined as the sum of geodesic distances between this vertex and all other vertices that can be reached. To calculate closeness, we transform the link matrix of Panel B into the geodesic distance matrix by replacing all the zeros by the geodesic distance (Panel C), which is possible for all the nodes because we have a connected graph. In a non-connected graph, closeness measure is sometimes normalized by dividing the sum of geodesic distance by the number of reachable vertices. Then the sum, of the rows (columns) is the closeness centrality. Another way to define closeness

(also used in closeness normalization) is to calculate the inverse of the sum of all geodesic paths from node v to any other vertex t :

$$C_c(v) = \frac{1}{\sum d_G(v, t)}$$

In this formula, the closeness centrality of vertex v ($C_c(v)$) is equal to the one divided by the sum of the lengths of geodesic paths (d_G) from v to any other vertex t .

The *betweenness* of vertex v is defined as the sum of its betweenness ratios, which are defined as the number of geodesic paths from vertex s to vertex t passing through vertex v , divided by the number of geodesic paths from s to t . In the above example, no geodesic path needs to pass vertex c , therefore the betweenness score is zero. Vertex b has a high betweenness score, since b is the only vertex adjacent to c and there is only one path from c to b . In this case, the number of geodesic paths between any vertices (except for b) and c passing b is equal to the number of geodesic paths between any vertices and c . Thus, vertex b has many betweenness ratios equal to 1 (which is the highest value of a betweenness ratio). The betweenness score, which is the sum of all betweenness ratios, is hence high for vertex b . In formula form, this is:

$$C_B(v) = \sum_{\substack{s \neq v \neq t \in V \\ s \neq t}} \frac{\sigma_{st}(v)}{\sigma_{st}}$$

where the denominator is the number of geodesic paths from vertex s to vertex t , the numerator is the number of geodesic paths from s to t with vertex v on the geodesic path. The betweenness can be normalized by dividing it by the maximum number of pairs of vertices not including k .

Eigenvector centrality of vertex v ($C_E(v)$) equals to the sum of all adjacent vertices' eigenvector centrality scores:

$$C_E(v) = \frac{1}{\lambda} \sum_{j=1}^N A_{v,j} C_E(j)$$

This calculation process begins with assigning score 1 to all the vertices. At each iteration, the score of vertex v is calculated as the sum of all adjacent vertices' scores

received in the previous iteration. In the above formula, the matrix A is an adjacent matrix capturing whether any vertex j is adjacent to the target vertex v . Therefore, the centrality score for each vertex evolves after every iteration. The factor λ is to make sure that the centrality scores converge rather than explode after several iterations. The advantage of eigenvector centrality over other centrality measures is that it not only captures the fact how many vertices are linked to the target vertex (degree), but also includes the network importance of those linked vertices (the degree of these linked vertices). A vertex has a higher eigenvector centrality score if it is connected to more vertices with higher scores.

Panel D of Table N1 presents the different centrality measures for the directors in the above example. In sum, degree, closeness, betweenness and eigenvector centrality are the four measures we use to measure the network centrality of our network graph. We can categorize degree and eigenvector centrality measures and their normalized versions as *measures of direct links or direct measures*. Closeness and betweenness plus the normalizations are regarded as *measures of indirect connections or indirect measures*. In the hypothesis section (see below), we state that networks designed to capture managerial power and those established for information collection can be measured by different types of centrality measures. Measures of direct links comprise degree and eigen vector centrality in the test of managerial power in director networks. Centrality measures capturing indirect links (closeness and betweenness) are used to measure the access to information through networks. As each vertex is representing a director, companies can also be viewed as being connected to each other through the directors who sit on the boards of both companies. To calculate the company network centrality, each company is a vertex in the graph and two companies are linked if they share at least one common director. Once the graph for company level networks is drawn, the centrality calculation is identical as that on the director level. In the context of this paper, it is also interesting to calculate networks for remuneration consultants. We identify all the clients advised by each consultant and then use the number of clients as a measure for the information access of that consultant.

N.3 Sample description: director networks

On average, the degree of a listed British company is 4, which means that there are 4 cross-directorships with a median of 3 (Table S1). The closeness measure is defined over all the connected vertices in the graph (which entails that all isolated vertices do not have a closeness measure). Whereas a higher degree signifies that a company is better connected, greater closeness implies that the company is further from the center of the graph. However, due to the inverse transformation, normalized closeness has opposite the interpretation: a higher normalized closeness indicates being more close to all vertices of the graph, or less distance to all other companies. The distribution of eigenvector and betweenness centrality measures are skewed, which means that a small proportion of companies (mostly the largest companies) are very well connected.

[Insert Table S1 about here]

Table S2 exhibits the annual centrality measures over the sample period 1996 to 2007. All centrality measures indicate that the connectedness of British companies increased slightly at the beginning of our sample period (1996-1999), then remained stable until 2004 when we observe a minor decline in the degree of connectedness. When we partition the sample companies according to size as reflected by index membership (FTSE 100, FTSE 250, FTSE SmallCap, and FTSE Fledging), we observe in Table S3 that larger firms have remarkably more links (degree) than other companies. The closeness measure confirms that larger firms are more closely related to all the companies in our sample than the members of the other indices. The eigenvector centrality measure shows that FTSE 100 companies are at more important positions in the network than are FTSE 250, Smallcaps and Fledglings. Lastly, the betweenness measures indicate that larger firms are more likely to be on any geodesic path in the graph. In practice, this implies that they are usually at the important junctions in the networks.

[Insert Table S2, S3 about here]

In order to understand more about the evolution of director networks in the UK, we employ additional network statistics to describe the yearly network graphs (Table S4). As the number of companies increases over time in our sample, the total number of links between companies increases as well, as shown by the increasing value in N link (number of links). However, the density of the graph, which is calculated as the number of links divided by the number of all possible links, decreases over time. This implies the companies in more recent years are less connected. The whole network graph comes sparser but counts more vertices. Let us now focus on the graphs' components, which are the number of vertices (e.g. companies) that are directly or indirectly connected with each other. We consider components of a size equal to at least three as important components. Table 5.4 exhibits that the number of components with more than three companies ($NC > 3$) increases steadily overtime. The size of the largest component (Max C) in every year increases for most of the years. We can therefore conclude that, as time passes, a growing proportion of companies opts not to be linked into the largest component, but to establish their own components.

[Insert Table S4 about here]

Table S5 considers the network structures by sector for the year 2007. The differences between sectors are remarkable. On average, companies from the financial, IT and medical sector are more connected than other sectors. However, these three sectors have different network structural features. In the financial sector, most companies are connected with each other through a gigantic component (including 75 companies), and only a few smaller coalitions exist (See Figure N3a). In the IT industry (Figure N3b), companies are likely to be linked to other companies in their sector, but the networks are smaller and a dominating component is absent. Although the size of the subsample of IT firms is similar to that of the financial sector, the size of largest component in IT sector is only one third of that in financial sector. The IT sector has many more median-large size components than the financial sector (13 versus 5).

[Insert Table S5 about here]

In the above discussion, we focused on corporate networks on the basis of directorships but in the context of managerial compensation policies it is also important to study whether firms are connected by employing the same remuneration consultant. Those connections may imply that information and insights on remuneration policies in other firms are more easily dissipated. The statistics of Table S6 indicate that many companies – mainly small firms and midcaps - do not hire external remuneration advisors. There have been 145-198 remuneration consultants active at anyone year. Over time, we observe an increasing trend of hiring a remuneration consultant. In the midst of our sample period (2002), a company is on average connected with more than 40 other companies through remuneration advisors. However, in the most recent years, on the average each company is linked with less than 40 companies through remuneration consultants. From 2003 onwards, we observe a trend reversal, which may be due to the fact that more remuneration consultants are more active in the market or that shareholders more frequently demand an explanation for valuable compensation packages of top management.

4. Data and Methodology

4.1 Estimation methods

As our main estimation method, we employ a random effects GLS regression. Regarding the choice between fixed effects versus random effects models, we opt for the latter for three reasons. Whereas a fixed effect model assumes that each individual company/director has a unobservable individual effect, a random effect model considers these individual effects as random deviations from a mean individual effect. Therefore, random effect model requires a large enough cross-section of a data panel relative to the sample period's length, which is satisfied in our sample of 12 years and at least one thousand companies in a year. In a fixed effect model, every subject's individual effect enters as a parameter in the regression model, which is avoided in the random effect model as the individual effects result from a draw from a random distribution. Random effects models have hence a higher number of degrees of freedom which gives the

random effect model a higher efficiency. Another advantage of the random effect model is that it is a weighted average of between and within estimators. Compared to the fixed effect model which is based on within group estimator, random effect model thus also considers the differences between individual averages. Lastly, fixed effect model cannot estimate time-invariant variables, such as gender and position, which are important in our analysis. We find that the explanatory variables in virtually all model specifications are not correlated with the individual effects, as shown by the Hausman test. As this condition holds, a random effect model is econometrically a more efficient method in panel data estimation.

We run the following two sets of regressions on:

a. the level of the CEOs' total compensation:

$$\begin{aligned} \text{CEO total compensation}_{it} = & \alpha + \beta_1 \times \text{Performance measures}_{it} \\ & + \beta_2 \times \text{Network measures}_{it} \\ & + \beta_3 \times \text{CEO characteristics}_{it} \\ & + \beta_4 \times \text{Corporate governance measures}_{it} \\ & + \beta_5 \times \text{Ownership concentration}_{it} \\ & + \beta_6 \times \text{Firm characteristics}_{it} \\ & + \sum_{j=1}^{12} \gamma_j \times \text{Industry}_j + \sum_{t=1996}^{2007} \delta_t \times \text{Time}_t \end{aligned}$$

The *network measure* included will be chosen based on the director network function we intend to test (managerial power or information collection). We will extend the analysis by replacing the above dependent variable by compensation sub-categories such as salary, fees, bonus and equity-based compensation. The *performance measures* consist of accounting performance (return on assets) and a stock performance measure (a market-adjusted return). *CEO characteristics* include the CEO's gender, tenure, age, membership of committees (audit, nomination and remuneration), and the combination of the positions of CEO and chairman of the board. Board structure variables is important internal *corporate governance* controls. Ownership concentration consists of the percentage of block holdings by category of shareholder. We categorize all the share stakes held by directors and all the blocks of 3% more into the following shareholder

categories: (i) investment and mutual funds, (ii) insurance companies, (iii) pension funds, (iv) banks, (v) nominees accounts, (vi) individuals and families not related to a director, (vii) industrial and commercial companies, (viii) CEO, (ix) executive directors (excluding the CEO) and (x) non-executive directors. Categories (i) to (iv) constitute the institutional investors⁶ and classes (viii) to (x) make up the insider ownership. Lastly, we include some firm characteristics such as size, capital structure, and stock price volatility. All regressions include industry and time dummy variables. The industry composition is presented in Appendix C where Panel A shows the number of firm-years in each sector over the whole sample and Panel B shows the number of firms in each sector in 2007. In Panel A, the sectors comprising the highest number of firms are Support Services (10.75%), Software and Computer Services (8.52%), Travel and Leisure (6.53%), Media (5.98%) and General retailers (5.91%). Panel B shows that at the end of our sample period (2007), the largest sectors now also include the finance industry. Panel C condenses the number of sectors into 12 broad industries.

Instead of the yearly time dummies, we include four indicator variables that could capture stock exchange trends: 1996-1997 (upward trend), 1998-1999 (strong boom prior to the bursting of IT bubble which dragged down the stock market early 2000), 2000-2003 (stock market downturn), and 2004-2007 (recovery). A description of the variables and the data sources are given in Appendix A.

b. The pay-for-performance sensitivity of CEO compensation

$$\begin{aligned}
 \text{Change in CEO compensation}_{it} = & \alpha + \beta_1 \times \text{Performance measure}_{it} \\
 & + \beta_2 \times \text{Network measure}_{it} \\
 & + \beta_3 \times \text{Network measure}_{it} \times \text{Performance measure}_{it} \\
 & + \beta_4 \times \text{CEO characteristics}_{it} \\
 & + \beta_5 \times \text{Corporate governance variables}_{it} \\
 & + \beta_6 \times \text{Ownership concentration}_{it} \\
 & + \beta_7 \times \text{Firm characteristics}_{it}
 \end{aligned}$$

⁶ The owners behind the nominees accounts are often also institutional investors (Franks, Mayer and Renneboog, 2001).

$$+ \sum_{j=1}^{12} \gamma_j \times \text{Industry}_j + \sum_{t=1996}^{2007} \delta_t \times \text{Time}_t$$

In the above pay-for-performance sensitivity regression, the change in the total compensation or a subcategory of compensation is the dependent variables, which may be partially explained by the interactions of performance and network centrality measures.

An analysis of remuneration contracting should also be related to the examination of CEO departure and dismissal because disregarding the CEO turnover decision may cause sample selection problems in the remuneration analysis (Renneboog and Trojanowski, 2005). When the analysis of changes in compensation only includes ‘surviving’ CEOs, the sample distribution is restricted which may lead to estimation biases. In order to study the compensation and turnover decision simultaneously, we also use the following Heckman sample selection method, also known as a type-2 Tobit model.

$$\begin{cases} \text{Turnover}_{it}^* = X_{1it}' \beta_1 + \varepsilon_{1it} \\ \text{Compensation}_{it}^* = X_{2it}' \beta_2 + \varepsilon_{2it} \end{cases} \quad (1)$$

$$\begin{cases} \text{Compensation}_{it}^* = X_{2it}' \beta_2 + \varepsilon_{2it} \\ \text{Turnover}_{it}^* = X_{1it}' \beta_1 + \varepsilon_{1it} \end{cases} \quad (2)$$

$$\text{CEO_stayed}_{it} = \begin{cases} 1 & \text{if } \text{Turnover}_{it}^* > 0 \\ 0 & \text{if } \text{Turnover}_{it}^* \leq 0 \end{cases}$$

$$\text{Observed_compensation}_{it} = \begin{cases} \text{Compensation}_{it}^* & \text{if } \text{Turnover}_{it}^* > 0 \\ \text{not observed} & \text{if } \text{Turnover}_{it}^* \leq 0 \end{cases}$$

, where $\{\varepsilon_{1it}, \varepsilon_{2it}\}$ are drawn from a bivariate normal distribution with mean 0, variances σ_1^2 and σ_2^2 , and covariance σ_{12} (Amemiya, 1984).ⁱ β_1 and β_2 are vectors of the model coefficients. In our models, i corresponds to a firm and t to a year. Turnover_{it}^* and $\text{Compensation}_{it}^*$ are underlying latent variables that are not observable. However, the sign of the Turnover_{it}^* variable can be observed and coded as a binary variable CEO_stayed_{it} : if a CEO lost his or her job (i.e., $\text{Turnover}_{it}^* \leq 0$) it is coded as 0, otherwise it is coded as 1. Obviously, compensation is only observed for CEOs who were

not dismissed. X_{1it} and X_{2it} are the sets of explanatory variables explaining CEO turnover and compensation, respectively. They include the measures enumerated above. The two sets of explanatory variables, i.e., X_{1it} and X_{2it} , are not disjoint (they can differ, however).

Throughout the paper we call Equation 1 the selection equation, while Equation 1 is the regression equation. The selection equation explains CEO turnover, i.e., $CEO_stayed_{it}=1$ corresponds to those firm-years when the CEO keeps his or her position. The regression equation explains the compensation of these CEOs in the subsequent year. As the notion of compensation sensitivity to previous year performance is not meaningful for new CEOs, we restrict the remuneration analysis to CEOs with tenure of more than one year. Estimating the parameters of the regression Equation 1b on the basis of the non-turnover sample only, would not be a valid alternative to the proposed method because the OLS estimator of β_2 is biased when the selection of the regression sample is endogenous (i.e., $\sigma_{12} \neq 0$).

4.2 Sample selection and data sources

We have collected the data on the remuneration of executive and non-executive directors as well as detailed board information from Manifest.info⁷. There is on average annual information for 1154 companies. Other company-specific data including sector categorization, accounting information (including profit measures, capital structure and firm scale), stock performance and stock volatility, are gathered from Datastream Advance. Ownership data is jointly provided by Manifest.info, Thomson Financial, and PricewaterhouseCoopers. Our dataset starts in 1996 (after the release of Greenbury Report on Managerial Compensation in 1995) and ends in 2007. It comprises most of the listed UK companies whose combined market value amounts to more than 99% of total market capitalization of the London Stock Exchange. The dataset comprises information

⁷ Manifest is an independent corporate governance and proxy voting specialist providing corporate governance and proxy data. More precisely, director's annual remuneration information and board information are collected from Manifest.info.

on 1758 companies⁸ on which we have 9789 firm-years. All sample companies are listed on the London Stock Exchange (LSE) and comprise large, medium-sized, small caps, as well as tiny firms. Virtually all companies belong to one of these indices: FTSE 100, FTSE 250, FTSE Smallcap, FTSE Fledgling, and FTSE AIM. The FTSE 350 comprises both the FTSE 100 (which consists of the 100 biggest companies that represent about 81% of the market capitalization of the whole LSE) and the FTSE 250 (which comprises the next 250 largest companies and represents about 15% of the UK market). FTSE Smallcap includes companies that are relatively small, and cover about 2% of the total LSE market value. We have also gathered data on firms included in the FTSE Fledgling index and FTSE AIM index, which are usually firms too small to be included in the FTSE All-Share index⁹. In sum, we have info on virtually the complete UK market. This fact is important in this context of network research as limiting the sample size to e.g. FTSE350 only would give a distorted picture of the networks existing in UK listed firms.

In case the length of the financial year deviates from the standard one year (it is then more than 30 days longer or shorter than 365), the remuneration and accounting information are adjusted accordingly to make sure they are comparable to other annual values. When a financial year is not coinciding with the calendar year, we apply this rule: e.g. we regard a financial year ending between January and June 31st 2005 as the year 2004 whereas we consider a financial year ending between 1st July and 31st of December 2005 as the year 2005.

In this study, the CEOs are the main subjects. The number of firm-years for which we have data on the CEO remuneration amounts to 9789 and even to 13854 when we use a broader definition of the CEO (in case the CEO is absent, we consider the managing director or the executive chairman as CEO – details of the CEO identification procedure are given in Appendix B). The remuneration packages designed for the top managers are more complex than for other executives, these packages are more valuable and (ought to

⁸ In our regression analysis, we will include 1216 firms as for firms without interlocked directors, the centrality measures are not defined.

⁹ FTSE All-Share can be seen as the aggregation of the FTSE 100, FTSE 250 and FTSE Small Cap Indices. It represents 98-99% of the UK market capitalization. FTSE AIM overlaps to some extent with FTSE Fledgling.

be) stronger related to firm performance. Hence, CEO's remuneration is considered as the best epitome of remuneration practices.

4.3 Remuneration data

The total remuneration package of a director can be dissected into these sub-categories: (i) salary, (ii) fee, (iii) bonus, (iii) equity-based compensation (stock options and long term incentive plans), (v) miscellaneous remuneration, and (vi) other. The *salary* includes a fixed payment and is usually paid out in cash (and exceptionally in shares). *Fees* are usually paid for consulting and supervisory services rather than for operational work and are hence more often compensation for non-executive directors or former executive directors. The *bonus* can consist of cash or shares and is usually paid when specific benchmarks or targets were reached over the past year (or past few years). Bonuses can also be voluntarily deferred or are compulsorily deferred for a vesting period of usually 3 years. In practice, the initial cash deferral bonus is often converted into stocks at favourable terms if the CEO commits to remain in his company or achieves some performance criteria over the vesting period. A deferred bonus realized in stock is recorded as restricted stocks and categorized as the equity-based compensation.¹⁰

Equity-based compensation includes *restricted shares* and *stock options*. Restricted shares are granted to the management under different schemes such as shares appreciation rights and deferred bonus schemes. In most circumstances, the restricted shares cannot be sold until certain goals are reached or subsequent to a vesting period. Restricted shares are valued at the market price at the grant date. The market price at grant date was collected from Datastream Advance. Stock options give the CEOs the right to acquire company stocks at a predetermined price (exercise price). Stock options in the executive remuneration package in the UK have often vesting conditions (performance benchmark) and always vesting periods, typically 3 to 5 years. We value the stock options by means of the Black-Scholes option pricing formula. Most options are granted at the money; the market price and stock price volatility at the grant date are

¹⁰ In our dataset, we include the deferred bonus plans in cash terms at the grant date. All performance related sub-categories are recorded and valued at the grant date.

collected from Datastream Advance. As we are lacking no information about the time to maturity of stock options in the Manifest.info database, we use ten years (the usual time to expiration at the grant date) as the default maturity for all stock option value calculations. The interest rate of 10 years UK government bonds (GILTS) is used as the risk-free rate.

Miscellaneous compensation includes compensation that is not paid out on a regular basis, and includes transaction bonuses, recruitment incentives, relocation expenses, and loss of office compensation. A *transaction bonus* is granted when the CEO has administrated major corporate transactions, such as mergers or acquisition or other types of asset restructuring. A *deferred cash bonus* (different from the deferred bonus defined above) is granted mainly with the aim of retaining the CEO. For instance, the CEO remains employed for the vesting period (typically 3-5 years) in order to claim this cash award (which is not performance-related). The *recruitment incentive* is paid when a position is difficult to fill without such an additional allurement and is associated only with new appointments. *Relocation expenses* are awarded in case the newly-appointed CEO needs to move near his new firm. The *loss of office compensation* is also known as severance pay (or golden parachute). When the contract is terminated before it expires, the CEO is compensated for this early departure. The payment of the severance pay is often not contractually specified and is often granted even the CEO is fired following poor performance. Our dataset also contains a remuneration category labeled ‘Other’, which is rare and includes all other forms of compensation and benefits that are not included in any of the above categories and comprises e.g. the CEO’s (medical) insurance costs paid for by the firm, some ‘ad hoc benefits’ and ‘unusual compensations’ about which the firms do not give detailed information.

The Manifest.info dataset also contains some information about pension contributions done by the company for the benefit of executive directors. Given that this information does not seem complete, we excluded it from the calculation of the value of the total yearly compensation.

Table R1 and Figure R1 summarize remuneration for the whole sample period 1996 to 2007.¹¹ The most important components of a CEO's compensation package in the UK are equity-based compensation (restricted shares and stock options), the fixed salary, and the bonus. On average, GBP 296,215 is paid to a CEO each year as equity-based compensation, which accounts for 44.8% of his total remuneration. The salary on average amounts to GBP 202,931 or 30.70% of the total remuneration. The bonus is also a significant source for a CEO's wealth accumulation with an average of GBP 126,290 or 19.11% of the total compensation. The remaining compensation components such as fees, miscellaneous compensation and other are only marginal and add up to a mere 5% of CEO compensation.

[Insert Table R1, Figure R1 about here]

How did the value of compensation packages evolve? Panel A of Table R2 and Figure R2 shows a strong increase in the total remuneration which peaked in the year 2000 (following the strong stock market boom that continued from the 1990s until 2000), was followed by a short-lived decrease in 2001-2002 (coinciding with the equity market decline and the collapse of the M&A market) and then kept rising till 2007. By 2007, the total remuneration for the CEO had almost doubled relative to its 1996 value. Over the entire sample period, the total remuneration increased at an average rate of 9.43% per annum. Panel A shows only modest increases in the fixed salary over time, but the augmentation of the bonus and equity-based compensation are striking as also reflected in the compensation structure. Particularly in 2000, when stock market peaked before the IT bubble burst, the equity-based compensation also became the most valuable aspect of a compensation package (amounting to 53.04% of the total remuneration). Panel B shows the inflation-adjusted remuneration values with 2007 as the base year and Panel C presents the median compensation values. Panel C hints that the distribution of CEO

¹¹ The tables R1-R5 and the tables in appendix D describe the remuneration variables. The numbers in bold are *unconditional* figures (i.e. these statistics are based on the whole sample independent on whether or not a specific type of compensation has been granted) and the numbers in normal face are conditional figures (these statistics are calculated based on the occurrence of a specific type of compensation). Unconditional remuneration statistics provide a good overview of the population but provide little insight when there are only few observations for a specific type of compensation.

compensation is highly skewed: a small number of well paid CEOs (mostly from FTSE 350) have driven up the average CEO compensation in the UK market. Figures R3 and R4 visualize the inflation-adjusted remuneration trends over the sample period. The figures confirm the strong increase in remuneration in 1999-2000, which is followed by a small and short-lived decline as from 2003 onwards, the compensation levels are again the 1999-2000 peak. The equity-based compensation is still a smaller part of the total remuneration of UK CEOs than that of US CEOs (where the proportion exceeds 50%). In 2007, CEOs of S&P 500 companies were paid USD 13.4 million on average whereas UK CEOs of FTSE 100 companies on average received GBP 4.3 million (USD 8.6 million).

[Insert Table R2, Figure R2a, R2b about here]

In order to illustrate the differences in CEO compensation across sectors, we show the remuneration of the five most paid CEOs (and their averages) for each sector in 2007 (Table R3). The table also includes information about CEO's gender, age, tenure, turnover and chairmanships. We learn that the companies in the industries of Financial Services, Food Producing, Media, and Utilities reward their CEOs most generously. The highest paid CEO in 2007 was Bart Becht from the Reckitt Benckiser Group with a compensation of GBP 31 million, followed by Terence Leahy from Tesco's earning GBP 21 million. For each of these CEOs (and most other top earners), more than 80% of their remuneration package consists of equity-based compensation

[Insert Table R3 about here]

That there is positive relation between CEO remuneration and corporate size (here captured by stock exchange index membership) has been documented in many remuneration papers before. Partitioning the sample firms based on membership of the FTSE 100, FTSE 250, FTSE SmallCap and FTSE Fledgling, we find that the CEO remuneration of the largest firms (FTSE 100) is respectively about 10, 5 and 2.5 times larger than that of the fledglings, small caps and FTSE 250 firms (Table R5 and Figure R5). The growth in nominal salaries for the CEOs leading fledglings was 9.8% per

annum, but has even been stronger at about 19.5% annually for small caps and FTSE 250 firms, and 15.3% for the largest firms. The details on compensation structure of executive and non-executive directors by firm size are presented in the tables of Appendix D. In sum, we first observe that directors, and particularly CEOs, are better compensated in larger companies. The CEOs in the FTSE100 companies are paid nearly ten times more than the CEOs in the FTSE Fledgling companies. Second, the structure of the compensation packages in large companies is markedly different than that of smaller companies. The bonus, restricted shares, and stock options form a larger proportion of the total executive directors' compensation of larger companies (where it amounts to about 70%). In the FTSE SmallCap and FTSE Fledgling companies, the proportion of the performance related compensation is down to less than 60% and 40% respectively. The difference in remuneration between companies from different indices is also reflected in the pay of the executive directors (excluding the CEO) and the nonexecutives. The executives in the FTSE 100 companies earn three times more than those of the FTSE SmallCaps and five times more than FTSE Fledgling companies. The differences in remuneration structure is also pronounced when comparing CEO income by index. For non-executive directors, the difference in fees also exists across firms belonging to different indices but is much less significant. Executive directors employed by a FTSE 100 firm earn on average £73,483 annually, which is about three times the pay received by the average nonexecutive director working for FTSE Fledgling companies (£27,581). Regardless the size of the company, the compensation of the non-executive director is always dominated by his fee, which is a fixed compensation, and is usually stable during for non-executive's stay in office. Third, executive compensation increases significantly above inflation (with annual growth rates of more than 15%) and the proportion of performance-based compensation, i.e., bonus and equity-based compensation rises even faster.

[Insert Table R5, Figure R5 about here]

4.4 CEO, board and firm characteristics

A CEO's age averages to about 53 years. While this average age remains relatively stable over time, the average tenure declines from 8.7 years in 1996 to 4.9 years in 2007 (Table T1). Executive directors are somewhat younger than the nonexecutive directors, 50 and 58 years respectively. This age and trend in tenure also persists in firms of different sizes and sectors - only the CEOs in the largest companies have a shorter than average tenure. Age and tenure data will enable to test whether remuneration depends on experience. In line with the findings on the gender of top management in other countries, we find that the top managerial market in the UK is dominated by male managers (Table T1). Although the proportion of female CEOs has slightly increased over time (from 0.8% in 1996 to 2.6% in 2007), the vast majority of CEOs is male.

[Insert Table T1, Figure T1 about here]

Across our sample period, CEO turnover amounts to 23.75% which includes 1.1% turnover resulting from the decease of the CEO and 10.4% 'forced' turnover (Panel A of Table T2). Given that the true reason behind the turnover is not available – most firms seem to use euphemistic terms to describe the CEOs departure - we distinguish between natural turnover and forced turnover. The former type of turnover comprises the departure of CEOs who are 63 years old and above (and hence near the retirement age) whereas we label the latter type as forced. We also collect information on the CEOs contract such as the notice period. Panel B shows that more than three quarters of the CEOs (77%) are required to hand in their notice twelve months prior to their intended departure. For about 12%, the notice period is longer than 20 months. Figure T1 depicts that turnover is stable relative stable over our 12-year time period but disciplinary turnover declines since 2000 from 15% to 7% in 2007.

[Insert Table T2 about here]

On average, the board comprises 8 directors of which 5 are non-executives (Table 3, Panel A). Merely 4% of the board members are female. In 13.1% of the firm-years, the CEO also chairs the board of directors. Given that such board duality could harm the

independence of the board's supervision, the UK Combined Code discourages the combination of the tasks of CEO and chairman. In this context, an average of 13.1% over our sample companies and the period 1996-2007 is rather high. While board duality is rare in the FTSE100 firms (3 out of 105 in 2007), it is more frequent in smaller firms (6 out of 86 for FTSE Fledgling companies in 2007). There is however a significant decline in board duality over time: in 1996, 21.0% of the CEOs had also summed the tasks of chairman while this number dropped to 7.0% by 2007.

[Insert Table T3 about here]

The Combined Code also requires that a firm institutes audit, nomination, and remuneration committees. In the context of the functioning and independence of these committees, it is important that these committees be staffed by non-executive directors. We investigate to which extent the CEO and other executive directors are present on these committees. Most companies, with exception of a fraction of the very small firms, comply with the UK corporate governance code and have audit (98%) and remuneration committees (88%) installed on the board. In more than 80% of all firm-years, a nomination committee has been created (Table T3, Panel B). Panel C shows the composition of the three major committees. Considering all firm-years in which a nomination committee is installed, the presence of executive directors is quite common. In more than half (53.5%) of these firm-years, we observe that at least one executive directors participates in the decision making of the nomination committee. The presence of executive directors on remuneration committee is also remarkable. Conditional on the presence of a remuneration committee exists, at least one executive director is member of the committee in one out of five firm-years. In Panel D, we examine the extent to which CEOs are present on the committees. Nomination committees have often been criticized as being not sufficiently independent from the CEO who could influence the appointments in order to have non-executive directors who are unlikely to oppose his views and not actively monitor the executive directors. In about 44% of the firm-years, the CEO is a member of the nomination committee which he chairs in 11.5% of the listed companies. CEO membership of the remuneration committee creates obvious conflicts of

interest, and Panel D exhibits that the CEO is a member of the remuneration committee in 10% of the firm-years and even chairs this committee that is to set his pay in 2% of the cases. One would expect that these conflicts of interest are much larger in smaller firms which also have smaller boards. Table T4 does indeed confirm that a CEO's committee membership linearly decreases with company size although CEOs are still a member of the remuneration committee in about 2.5% of the firm-years in FTSE 100 and in 7% for FTSE 250.

[Insert Table T4 about here]

Remuneration committees frequently hire outside advice from remuneration consultants (42% of all companies in 2007) and report their main consultant (Table T5). The most frequently hired remuneration consultant as reported by the firm in its annual report is New Bridge Street Consultants (hired by 15.3% of the firms at some point in time), followed by Towers Perrin (5.8%), and Deloitte and Touche (4.9%). Of the listed companies, 22.8% report that they only use internal advice to set managerial pay.

The CEO compensation may also be determined by company specific factors. In our empirical analysis, we will include corporate performance, firm size, capital structure, and stock price volatility as control variables. Accounting and stock performance are measured by the return on asset (ROA) and the market-adjusted return. The book value of total asset captures company size. The capital structure is measured by the long-term debt to total asset ratio. Stock volatility is the variance in stock price over the past 52 weeks.

[Insert Table T5 about here]

4.4.4 Insider and outsider ownership concentration

We categorize all the share stakes held by directors and all the blocks of 3% more into the following shareholder categories: (i) investment and mutual funds, (ii) insurance companies, (iii) pension funds, (iv) banks, (v) nominees accounts, (vi) individuals and

families not related to a director, (vii) industrial and commercial companies, (viii) CEO, (ix) executive directors (excluding the CEO) and (x) non-executive directors. Categories (i) to (iv) constitute the institutional investors¹² and classes (viii) to (x) make up the insider ownership. Table O1 exhibits that the ownership concentration is rather stable over time and fluctuates around 25%; it is 23.6% in 1998 and 25.9% in 2007. Insider ownership concentration, which combines the share stakes owned by the CEO, the other executive directors as well as the non-executive ones amounts to about 7% over the whole sample period. Relative to other countries (the US and Continental Europe) where executive directors rarely hold share stakes of more than 0.5% of the total shares outstanding of listed companies, executive ownership concentration in the UK is high. The CEO and his executive directors own on average almost 7% of the equity, which gives them significant voting power. The average CEO holds 2.5% of the market capitalization. From 1998 to 2001, an upward trend in insider ownership concentration is visible, possibly caused by an increase in the use of equity-based compensation for the top management. Subsequently, the combined insider stakes stabilize around 7%. The shareholder category with the highest ownership concentration is that of the investment funds that on average hold almost 15% of the equity. The investment fund sharing holdings percentage has increased gradually over the sample period from 10% in 1999 to 17.5% in 2007. The ownership concentration held by funds offered through banks and by pensions funds remains relatively over time. All the institutional shareholder classes combined control around 22% of the voting rights. The combined equity stakes of industrial and commercial corporations is almost 8% over our sample period.

[Insert Table O1 about here]

Table O2 investigates the relation between ownership concentration and firm size. The ownership concentration is smallest in the FT100 firms in which the aggregated share blocks account for 13.4% of the market capitalization. The corresponding percentage for the FT250, Smallcaps and Fledgings are larger at 22.6%, 27.3% and 29.9% respectively.

¹² The owners behind the nominees accounts are often also institutional investors (Franks, Mayer and Renneboog, 2001).

The share stakes that individual ownership and directors are able to acquire in the largest firms are expectedly small: insider ownership in FTSE100 averages to 1.2% and individuals and families not related to a director are only relatively rarely able to accumulate share blocks of 3% or more (the reporting threshold) such that their average ownership is only 0.8%. Table 4.4.12 also shows that insider ownership is already significantly higher (at 4.5% in FTSE250 firms) and augments with size to 8.6% in Fledglings. Investment funds' average stake ranges from 8.1% in FTSE100 to 19.1% in Fledglings. Table O3 documents differences in ownership concentration and structure across sectors. The most concentrated industries are the financial, manufacturing, logistic, and utility industries. Least ownership concentration can found in retailing, communications, and leisure.

[Insert Table O2, O3 about here]

5. Result interpretation

5.1 Compensation and director network centrality

In table 6.1, we estimate the impact of social networks on the CEOs' total annual compensation, which includes salary, fees, bonus, equity-based compensation and some miscellaneous income.

In the first column, the degree centrality that is measured at the individual director (CEO) level (Degree (D)), significantly increases in the CEO's total compensation. CEOs with a strong social network based on direct connections have higher compensation. When we replace degree by the eigen vector centrality of the network, we reach similar results.¹³

We also investigate the relation between networks based on indirect connections, or the closeness level, which proxies for the information-value of the network, and remuneration. As shown in the third column, normalized closeness (nCloseness (D)) indeed significantly boosts the CEO compensation. This implies that a CEO's network

¹³ Tables with alternative centrality measures are available upon request.

resources are valuable to and valued by the company. We only enter one type of centrality measure because some centrality measures proxy for similar types of connections (degree and eigenvector for direct links and closeness and betweenness for indirect links); still the correlations between some centrality measures such as degree and normalized closeness are very small (0.18). When we include both simultaneously into a model similar to the one in column 1 (not shown), we observe that both remain strongly statistically significant. So, this suggests that both our market power hypothesis (powerful CEOs extract higher compensation) and the information-value hypothesis (CEOs with networks enabling them to collect valuable information or resources) are both upheld. The degree coefficient's economic significance is stronger than that of the closeness coefficient. When each measure moves up one standard deviation, the impact on total compensation is 8.8% for the former and 3.5% for the latter. This suggests that direct links are more important and that there is somewhat more support for the market power hypothesis.

Now we turn to the centrality measures on the company level: a firm's degree shows how many boards are interlocked with this firm. The second column shows that company degree (Degree (C)) has a significant positive impact on the CEO's total compensation. The fact that degree is high signifies that these board members are active in many other companies as executive or non-executive directors which may imply that these directors divers some of their time and energy. The probability of reciprocal collusion on each other's remuneration design also increases with a higher number of board interlocks. When a board is more interlocked, corporate governance becomes less effective, and as a possible consequence, the CEO is able to extract higher compensation. In the last column, we evaluate the impact of company level closeness (nCloseness (C)), the collection of indirect links of the company through its directors. We find a negative correlation which signifies that when a firm has many indirect links, it depends less on the network of the CEO to attract values information and resources such that the firm pays out a lower total compensation. This supports hypothesis H3 which states that more access to information improves the efficiency of remuneration design. (Below, we show more evidence on the pay-for-performance regressions).

While the centrality measures are related to total compensation, we also investigate whether they have a different impact on the various components of pay (Tables 6.2 –6.5). We first turn to the fixed salary models (Table 6.2). Our earlier results are upheld: the CEO's direct network (degree (D)) yields a higher fixed salary and so does the company's direct network (Degree (C)). We also find that indirect networks are also valued in monetary terms given the positive correlation with fixed salary. However, the CEO's fixed salary does not decrease when the company's information collection ability through the combined director network is high.

We reach similar conclusions for our analysis of the relation between direct networks, and the bonus (Table 6.4) and equity-based compensation (Table 6.5). The degree on the individual as well as company level increases for these two sub-categories of compensation. Also, the closeness measure for individual CEO networks increases the CEO's bonus and equity-based pay. Yet, the closeness on the company level limits these aspects of pay. So, it seems that a well-connected company that relies less on the CEO's network, pays lower bonuses and equity-based compensation. We do not find any impact of networks on fees (Table 6.3) and other types of compensation not included in the above categories. The managerial power generated by direct networks pushes up all main components of CEO compensation. The information-collection ability at the firm level reduces the performance-based compensation, bonus and equity-based pay.

To sum up, a CEO's network increases his compensation through two channels. In line with the managerial power hypothesis, the CEO's direct links grant him more influence over the board. Potential collusion between network members may contribute to a larger remuneration package. We also find evidence that if the CEO has a valuable network to information collection, his pay increases accordingly. This is in line with our prediction on the information collection hypothesis: a company rewards the CEO for the resources a CEO can contribute to the firm through his network. When we study the director networks on the company level, the managerial power hypothesis and information collection hypotheses make different predictions. More specifically, we measure the

direct links from the company to all ‘adjacent’ companies and the indirect links from the company to all companies in the population. The former, direct centrality (degree) has positive correlation with CEO total compensation and its components. This result suggests that the direct interlocks of board members may weaken corporate governance efficiency and result in higher CEO compensation. The later measure, closeness at the firm level, lowers CEO compensation because the board is better informed and needs to rely less on the CEOs network. These two results jointly that it is important to have the ‘right’ type of networks, which can provide valuable information rather than managerial power.

Our results are not only significant in a statistical sense, but also economically. Table 6.6 shows the economic significance of a one standard deviation change of the centrality measures. The degree measures on individual level and company level have relatively large influence (9% and 15% respectively) on the CEO’s total compensation. The information-collection related measures have a smaller impact. A one standard deviation increase of closeness (which stands for better individual information access) raises the total compensation by 4%. When such information advantage is realized on the company level, total compensation is lowered by about 4%. In short, networks that enhance managerial power seem more influential than information-collection networks.

We move on to analyzing the pay-for-performance sensitivity, which is captured by performance and the interaction term between network and performance. Table 6.7 shows that when the number of direct connections (columns 1 (Degree D)) increases, the change in total compensation becomes less sensitive to the stock performance. This is in line with the managerial power hypothesis as we had already found a higher compensation for CEOs with stronger direct connections and now find that the stock performance sensitivity declines for this type of CEOs. We do not find any evidence for accounting performance sensitivity. When the degree on the company level is high (column 2 of Table 6.7), we also find a lower sensitivity. A higher degree at the company level signifies that all the directors combined have many direct links with other companies. This implies that the executive directors may be more powerful but also that the

non-executive directors exert duties in other firms which may erode their corporate governance effectiveness (busy board hypothesis). When we turn to the information collection aspect of the director networks, we note the closeness measure for the CEO (nCloseness (D)) has no significant impact on the pay-for-performance sensitivity of his remuneration. This implies that a stronger director network position for the purpose of information collection is not translated into a stronger pay-for-performance sensitivity. When we consider closeness on the company level, we observe less accounting performance-sensitivity, which does not support hypothesis 4.

We have also included in each model a firm's network resulting from the connections of their remuneration consultant through his client firms. This measure also captures a firm's information gathering ability, similar to the closeness centrality discussed above. The firm benefits then from information on the remuneration practices of the remuneration consultant's clients. The estimated network coefficient of the remuneration is positive and significant, implying that companies associated with remuneration with a large network pay their CEOs more. The interaction term of firm size and consultant network size is also significantly positive which signifies that larger firms employing larger remuneration consultants grant their CEOs a larger total compensation.

5.2 Other determinants of CEO Compensation

We have also controlled the above results for corporate performance, company size, CEO characteristics, and corporate governance variables such as share block concentration and board composition.

In most models, both our *accounting* and *stock price performance* have a significantly positive impact on total compensation. In the pay-for-performance analysis, the change in total compensation is more sensitive to stock performance than accounting performance. When the changes in the components of compensation are examined (not shown), we find that salary is more elastic to accounting performance measure than to stock performance. Performance-related compensation including bonus and equity-based compensation are

significantly positively influenced by both accounting and stock performance. Lastly, fees are not related to performance.

In line with all the compensation literature, company size drives up CEO compensation as larger companies pay more to attract and retain top managers. The debt to asset ratio is also positively related to the CEO compensation, which suggests that companies with high gearing (some of which may be financial distressed) need to attract CEOs with more rare skills. CEO remuneration decreases with the stock price volatility decreases CEO total remuneration, which is somewhat counterintuitive as we would expect the CEO to be better compensated in risky firms which may be more difficult to manage or demand a larger equity-based compensation package (which is not the case).

We also investigate the impact of CEO characteristics on his or her remuneration. Contrary to some of the gender literature, we do not find any difference between the compensation of male and female CEOs, which may be the result of including other control variables such as tenure, age, industry, corporate size. Not surprisingly, a CEO's compensation increases with tenure. Combining the function of CEO with the tasks of the chairman does increase his salary at a first glance. However, further investigation reveals that the combination of both functions is almost exclusively in small companies where the CEO compensation is lower. When we add the interaction term between the combination of CEO and chairmanship and total assets, the result indicates that a CEO earns more if he is also the chairman, considering firm size. We also include a dummy variable that equals one if the CEO is a member of one of the committees (audit, nomination and remuneration), as such memberships his influence in the company. The results confirm that the committee membership yield the CEO a larger compensation. When we include membership of the remuneration committee, we find that conflicts of interest may prevail as the CEO's total compensation augments. Lastly, the notice period of the CEO is not related to his pay.

The board characteristics variables include the percentage of nonexecutive directors and the percentage of female on the board. In most model specifications, both percentages are

positively correlated with CEO total compensation. Contrary to Chhaochharia and Grinstein (2008) who work on the US, our finding suggests that non-executive directors in the UK are lenient in granting the CEO high compensation. This may result from the fact that non-executive directors are executives in other firms and raising the pay in one firm, may increase the compensation in their own firm.

The last set of control variables consist of the ownership concentration. Among the three insider ownership categories, the CEO stock holdings is the only factor that significantly influences total compensation. Intuitively, as the CEO acquires a larger share stake in his company, a larger fraction of his wealth is tied to the corporate performance. Hence, he may need to be less incentivized through remuneration. We also find that non-executives owning share stakes are not more effective supervisors. As for the outsider ownership, in the categories of outsider block holders (classified as beyond 3%), only individual block holdings held by individuals or families not related to a director and the share stakes held through nominee accounts reduce the CEO's compensation. Industrial block holdings are not related to the level of compensation but reduce changes in compensation. These findings provide some evidence that outsider block holders curb excessive compensation. However, if large share stakes are owned by institutional owners (bank, investment fund, pension and insurance company), the total compensation of the CEO is high. This does not contradict the fact that most institutional shareholders are passive monitors. A more detailed analysis by type of institutional owner is performed below in section on robustness checks.

6. Further analysis and robustness checks

6.1 Endogeneity

One criticism is that there might be one common factor which contributes to both high compensation and strong network connections. For example, a successful CEO who is well compensated attracts non-executive directorships because he has a good track record (good past performance). Therefore, we apply an instrumental variable approach with board size and the CEOs honorary title as the instrumental variables for the centrality

measures at the individual director (CEO) level. In Table 7.1, we confirm our results that corroborate the managerial power hypotheses as high CEO degree measures boost total compensation. Similarly, on the company level, the model with instrumental variables generates a similar conclusion as the one implied by the random effects models: high degree measures on the company levels (proxying both for executive power and busy boards) lead to higher CEO compensation. We do not find a significant impact of the closeness measures which captures the information collection value of a network. We also run a regression with individual CEO fixed effects, but we reach the same as shown in Table 7.2: the relations between network centrality and compensation still persist.

6.2 Heckman sample selection equation

In most existing academic literature, the two main monitoring devices related to top management, namely the compensation (the carrot) and dismissal (the stick), are examined separately. However, Renneboog and Trojanowski (2005) point out that disregarding CEO turnover could cause sample selection problems. With the departing CEOs are not included the year of departure (when a new CEO is hired), the sample distribution is biased. In order to take the information of CEO turnover into account, we employ the Heckman sample selection equations to simultaneously study turnover (the selection equation) and compensation (the regression equation). Table 7.3 shows that the type-2 Tobit model yields virtually the same results as those resulting from the random effects models.

6.3 Other centrality measures

Besides the degree and closeness measures, we use additional network statistics for estimating the strength of networks based on direct and indirect links. In Table 7.4, we show the regression models with eigenvector centrality and betweenness measure as substitutes for degree and closeness, respectively. The details on the measurement can be found in the network methodology section. On the individual networks, both eigenvector centrality (nEigen (D)) and betweenness (nBetweenness (D)) are significantly positively correlated to total compensation, which is in line with our findings for degree and closeness. At the company level, whereas the eigenvector centrality estimates are in line

with those for degree, the betweenness measure yields different results than closeness. Although the betweenness measure is very different from degree, the correlation in this sample between betweenness and degree is high, which explains its parameter estimate.

6.4 Fees and the combination of the functions of CEO and chairman

In the results above, the separation of CEO and chairman does not seem to affect salary, bonus or equity-based compensation. When we run a regression with total fees as the dependent variable, we observe that the dual position is largely compensated by means of fees.

6.5 Sensitivity: change in performance-related compensation

While in the previous section, we analyzed the total pay-for-performance sensitivity, we also examine the change in performance-related compensation (the sum of bonus and equity-based pay) to estimate the sensitivity. Our results are similar to those shown above.

6.6 Institutional ownership classification

Our models include the main categories of owner. We partition all institutional investors into more detailed shareholder classes in order to investigate further which types among the institutions are more effective in influencing CEO pay. Table 7.6 exhibits that pension funds are able to restrain the CEO compensation whereas the presence of blocks held by other classes of financial institutions does not have an effect or even a positive one on CEO pay.

6.7 Regressions on other sample specifications

New and old contracts

Our random effect models were applied to all firm-years. With the Heckman sample selection models, we focused on on-going CEO contracts. The compensation-centrality relation for a new CEO may be different than for ongoing contracts. Compensation for the new CEO does not hinge on the past-performance of his new firm (but possibly on the

performance of his old firm). Therefore, the first year contract typically includes more extraordinary compensation components such as a sign-on bonus or relocation fee. These elements may be less relevant to the network-compensation relation. We still run our models on two separate samples, the new contracts and the old (on-going) contracts. For both the models applied to the new and the on-going contracts, we find very similar results as the ones shown in section 5 (except that company level closeness measure loses its significance for new contracts).

Excluding financial companies

The current sample includes all listed UK companies on the London Stock Exchange (including the ones listed on the Alternative Investment Market). We have also included financial companies in the network calculations as some bankers also belong to the director networks of industrial and commercial companies. Given that financial companies have a different asset organization and comply with different regulatory requirements than firms from other sectors, we re-estimate our results excluding financial firms; note that the director network measures are still calculated based on the graph including all companies. The result of Table 7.9 show that the non-financial sample yields the same results as shown above.

CEO and CEO equivalents

Some companies do not have an executive director with the title of CEO. These companies are usually small and led by managing directors or other senior executives. We did not include these ‘CEO equivalent’ managers in our main regression. As a robustness check, we present regression result on the sample including both the CEOs and the CEO equivalents. The method to selection the CEO equivalent is explained in appendix B. As Table 7.10 shows, the results from this larger sample is quite similar to the CEO sample

7. Conclusion

In this paper, we have examined the relation between directors' social networks, and CEO compensation and pay-for-performance. Specifically, we distinguish two possible uses of networks: the accumulation of managerial power and the collection of valuable information and resources. The former implies that powerful CEOs may take advantage of their position to extract high benefits such as compensation at a cost to the shareholders. The later function is beneficial to the company. The existing literature does not address this difference but we make this distinction by employing network centrality measures on the direct and indirect level. Strong direct networks, measured by degree and eigenvector centrality, proxy for managerial power whereas strong indirect networks, measured by betweenness and closeness, proxy for the information-collection value. We find that both strong direct and indirect networks are rewarded by a higher compensation (fixed salary, bonus, and equity-based compensation). When we look further into pay-for-performance sensitivity of the CEO compensation, we find that strong direct networks decrease pay-for-performance sensitivity. High CEO compensation and low pay-for-performance corroborates the managerial power hypothesis. While the information value of indirect networks is reflected in higher CEO compensation, this type of networks does not influence the pay-for-performance relation.

When we study the director networks on the company level, the managerial power hypothesis and information collection hypotheses make different predictions. More specifically, we measure the direct links from the company to all 'adjacent' companies and the indirect links from the company to all companies in the population. We find that strong direct company networks leads to higher compensation (in all its components) and lower pay-for-performance sensitivity. This finding is in line with the managerial power hypothesis but also with the busy board hypothesis as directors who exert duties as executive or non-executive director may be less effective monitors as reflected in high CEO compensation with low pay-for-performance sensitivity. Closeness at the firm level, lowers CEO compensation because the board is better informed and needs to rely less on the CEOs network. These two results jointly that it is important to have the 'right' type of networks, which can provide valuable information rather than managerial power.

We have controlled the centrality-CEO compensation relation for many CEO, board and company characteristics. For instance, we confirm that there are conflicts of interest when a CEO is a member of the remuneration committee because his compensation is then significantly higher. The size of the remuneration consultant network increases CEO compensation, especially in large firms. The proportion of non-executive directors and female directors increase CEO total compensation

A set of robustness tests including an instrumental variable approach, sample selection method, fixed effects regressions, specifications with alternative variables confirm the main results.

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Figure 1. Example of a CEO's professional network

This Figure depicts the director networks surrounding Andy Hornby (white circle in the middle of the graph). Directors in the four companies served by Andy Hornby are represented as circles in different colors. In this figure, each circle stands for a vertex (director) in the network. Directors sitting on the same board established links between them. The lines between circles are the links between vertices (directors). The size of a circle represents the number of links it has. Data source: Own calculations based on Manifest.

Figure N2. A Director Network Graph

This figure is a hypothetical director network graph used for centrality illustration.

Figure N3a. The network of the financial sector

This is the company networks in the finance industry in the UK market, 2007. Each box stands for a financial company. Data source: Own calculations based on Manifest.

Figure N3b. The network of the IT sector

This is the company networks in the IT industry in the UK market, 2007. Each box stands for a company. Data source: Own calculations based on Manifest.

Table N1. An example of director network

These tables explain how director networks are mathematically recorded and calculated. Panel A is an overview on the example network. Panel B is the matrix used to record the network. Panel C calculated the geodesic distance between each pair of directors. Panel D shows the basic centrality measures calculated for this example network.

Panel A : Example of a network

Company	Director	Company	Director
1	a	5	a
		5	b
2	b	5	j
2	c	5	f
		5	d
3	a		
3	e	6	b
3	f	6	g
		6	d
4	h	6	e
4	d	6	h
4	i	6	i
4	j		

Panel B : Matrix representation of above table.

	a	b	c	d	e	f	g	h	i	j
a	0	1	0	1	1	1	0	0	1	1
b	1	0	1	1	1	1	1	1	1	1
c	0	1	0	0	0	0	0	0	0	0
d	1	1	0	0	1	1	1	1	1	1
e	1	1	0	1	0	1	1	1	1	0
f	1	1	0	1	1	0	1	0	1	1
g	0	1	0	1	1	1	0	1	1	0
h	0	1	0	1	1	0	1	0	1	1
i	1	1	0	1	1	1	1	1	0	1
j	1	1	0	1	0	1	0	1	1	0

Panel C : Geodesic distances

	a	b	c	d	e	f	g	h	i	j
a	0	1	2	1	1	1	2	2	1	1
b	1	0	1	1	1	1	1	1	1	1
c	2	1	0	2	2	2	2	2	2	2
d	1	1	2	0	1	1	1	1	1	1
e	1	1	2	1	0	1	1	1	1	2
f	1	1	2	1	1	0	1	2	1	1
g	2	1	2	1	1	1	0	1	1	2
h	2	1	2	1	1	2	1	0	1	1
i	1	1	2	1	1	1	1	1	0	1
j	1	1	2	1	2	1	2	1	1	0

Panel D : Centrality measures

	Degree	Betweenness	Closeness	Harmonic closeness	Eigen centrality
a	6	0.167	12.000	1.200	0.299
b	9	8.933	9.000	1.000	0.379
c	1	0.000	17.000	1.800	0.054
d	8	0.933	10.000	1.059	0.372
e	7	0.567	11.000	1.125	0.336
f	7	0.567	11.000	1.125	0.336
g	6	0.167	12.000	1.200	0.299
h	6	0.367	12.000	1.200	0.293
i	8	0.933	10.000	1.059	0.372
j	6	0.367	12.000	1.200	0.293

Table R1. CEO remuneration

This table shows CEO total remuneration and its components for the whole sample and over the period 1996 to 2007. N is the number of observations (firm-years). Mean stands for the average value; SD is the standard deviation. P25 and P75 are the value at the first and third quartile, respectively. Percent captures the percentage of the total remuneration that is awarded via this type of remuneration. The values in bold are unconditional statistics, which takes into account all variables with a zero value. The other values are conditional statistics based on non-zero values only. N (the number of observations) always equals to maximum number of observations possible for the unconditional statistics. The N for the conditional statistics is the number of firm years when a certain type of remuneration is actually given. Data source: Own calculations based on Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	13,854	202,931	203,891	0	0	166,000	296,600	2,400,000	30.70%
Salary in cash	3,392	302,738	220,312	1,846	151,086	249,500	395,000	2,248,685	
Salary in shares	8	21,412	27,830	2,993	2,999	5,000	41,374	69,554	
Total fees	13,854	4,032	45,895	0	0	0	0	4,939,000	0.61%
Fees in cash	685	32,777	50,598	448	19,000	23,000	29,412	1,000,000	
Fees in shares	1	755,555		755,555	755,555	755,555	755,555	755,555	
Total bonus	13,854	126,290	357,054	0	0	9,000	120,764	10,000,000	19.11%
Bonus in cash	7,006	221,039	401,899	130	50,000	112,500	241,000	10,000,000	
Bonus in shares	71	259,067	475,088	2,658	60,000	121,874	254,363	3,116,035	
Bonus vol deferred	74	284,467	299,701	6,445	81,975	166,500	420,000	1,312,500	
Bonus mand deferred	383	351,810	471,916	2,296	90,000	185,853	426,770	3,837,500	
Total equity	13,854	296,215	2,507,032	0	0	0	112,998	186,841,117	44.81%
Restricted shares	2,724	873,798	3,311,575	2	144,230	335,248	735,428	134,000,000	
Stock options	2,504	724,886	6,170,366	0	85,577	202,765	424,812	186,841,117	
Total miscellaneous	13,854	6,678	100,691	0	0	0	0	6,333,880	1.01%
Transaction Bonus	24	730,499	1,090,632	25,014	88,604	158,125	1,067,548	4,686,697	
Deferred Cash Bonus	74	315,155	763,065	573	66,973	138,000	299,623	6,333,880	
Loss of Office	88	372,080	327,852	20,775	156,500	267,550	442,500	1,544,745	
Recruitment incentive	29	535,351	800,968	4,556	87,500	221,799	539,000	3,225,044	
Reallocation expenses	28	121,207	134,532	5,000	38,146	72,000	130,055	500,000	
Other	13,854	24,867	102,144	0	0	10,000	20,000	6,624,000	3.76%
Overall Total	13,854	661,012	2,652,929	0	39,375	253,684	622,868	186,879,117	100%

Figure R1. CEO remuneration structure over the whole sample from 1996-2007
This pie chart shows the proportions of different components of CEO remuneration.

Table R2. CEO remuneration structure over time

This table shows the CEO remuneration structure over time. Panel A shows the average CEO compensation over time, the percentages are the proportion of this compensation component as part of total compensation. Panel B contains inflation-adjusted remuneration values, with 2007 as the base year. Panel C shows the CEO median compensation over time. N is the number of observations in each year. Equity-based compensation includes restricted shares and stock options. Miscellaneous covers transaction bonus, deferred bonus, loss of office, recruitment incentive and reallocation expenses. Except for Panel C, all the values are unconditional on whether that type of remuneration is granted. If a type of compensation is not granted to the CEO in a firm-year, a zero will be recorded as its value. Data source: Manifest, Datastream, UK National Statistics Online (CPI data).

Panel A

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
N	749	832	915	984	1,065	1,133	1,117	1,151	1,400	1,449	1,528	1,531	13,854
Salary	181,009	190,203	192,741	194,401	204,652	209,295	210,977	217,923	203,087	205,214	200,275	209,441	202,931
	44.59%	49.54%	48.80%	48.42%	28.18%	33.44%	32.78%	28.72%	26.62%	27.63%	25.55%	23.56%	34.82%
Fee	2,343	2,357	2,243	7,670	3,114	2,885	3,428	3,862	3,891	3,741	4,404	6,584	4,032
	0.58%	0.61%	0.57%	1.91%	0.43%	0.46%	0.53%	0.51%	0.51%	0.50%	0.56%	0.74%	0.66%
Bonus	68,493	72,037	71,636	86,503	104,508	81,872	101,129	124,207	131,794	163,452	194,364	202,084	126,290
	16.87%	18.76%	18.14%	21.54%	14.39%	13.08%	15.71%	16.37%	17.28%	22.01%	24.79%	22.74%	18.47%
Equity-based	131,144	96,742	96,935	83,871	385,216	302,648	286,757	380,858	388,319	338,883	352,450	436,809	296,215
	32.30%	25.20%	24.54%	20.89%	53.04%	48.36%	44.55%	50.19%	50.91%	45.63%	44.96%	49.15%	40.81%
Miscellaneous	521	292	245	1,833	1,764	823	14,659	5,012	11,010	9,493	9,772	13,586	6,678
	0.13%	0.08%	0.06%	0.46%	0.24%	0.13%	2.28%	0.66%	1.44%	1.28%	1.25%	1.53%	0.79%
Other	22,454	22,316	31,146	27,231	27,027	28,311	26,761	27,030	24,679	21,906	22,662	20,282	24,867
	5.53%	5.81%	7.89%	6.78%	3.72%	4.52%	4.16%	3.56%	3.24%	2.95%	2.89%	2.28%	4.44%
Overall Total	405,962	383,947	394,946	401,510	726,281	625,833	643,711	758,891	762,779	742,689	783,927	888,786	661,012

Panel B. Inflation adjusted

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	All
N	749	832	915	984	1,065	1,133	1,117	1,151	1,400	1,449	1,528	1,531	13,854
CPI Index	84.1	85.7	87.0	88.2	88.9	90.0	91.1	92.4	93.6	95.5	97.7	100.0	
Salary	215,115	222,010	221,515	220,518	230,151	232,624	231,544	235,952	216,972	214,859	204,974	209,441	221,306
Fees	2,784	2,751	2,578	8,700	3,502	3,207	3,762	4,182	4,157	3,917	4,507	6,584	4,219
Bonus	81,399	84,083	82,330	98,124	117,529	90,998	110,987	134,483	140,804	171,134	198,924	202,084	126,073
Equity-based	155,854	112,920	111,406	95,139	433,213	336,383	314,711	412,366	414,867	354,811	360,719	436,809	294,933
Miscellaneous	619	341	282	2,079	1,984	915	16,088	5,427	11,763	9,939	10,001	13,586	6,085
Other	26,685	26,048	35,796	30,889	30,394	31,467	29,370	29,266	26,366	22,936	23,194	20,282	27,724
Overall Total	482,454	448,152	453,906	455,451	816,774	695,591	706,463	821,674	814,928	777,595	802,318	888,786	680,341

Panel C

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
N	749	832	915	984	1,065	1,133	1,117	1,151	1,400	1,449	1,528	1,531	13,854
Salary	154,000	159,000	168,000	168,937	175,000	176,000	180,000	186,000	163,000	156,905	151,625	151,086	166,000
Fees	0	0	0	0	0	0	0	0	0	0	0	0	0
Bonus	21,926	25,000	22,361	25,000	13,000	0	0	20,000	4,500	0	0	0	9,000
Equity-based	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	10,000	11,000	11,000	12,000	12,038	12,000	12,000	12,000	8,000	3,664	2,020	1,000	10,000
Overall Total	214,100	226,382	237,720	236,000	263,000	267,418	273,000	309,540	270,915	259,170	241,288	228,727	251,303

Figure R2a. CEO Remuneration over the whole sample from 1996-2007

This figures shows the change in the value and structure of CEO compensation over the whole sample period.

Figure R4b. Real (Inflation adjusted) and Nominal CEO remuneration over the whole sample from 1996-2007

This figure shows the CEO compensation trend over time, in inflation adjusted value and nominal value.

Table R4. The best paid CEOs by industry in 2007

This table shows the five highest paid CEOs by sector in 2007. Tenure is the number of years he/she has served as CEO. When turnover equals 1, the CEO will not leave his position in the subsequent year. When CEO=chair equals 1, the CEO is also the chairman of the board. Data source: Own calculations based on Manifest and Datastream.

CHEMICAL														
Company	First_name	Surname	Gender	Age	Tenure	Turn over	Chairman	Salary total	Fees total	Bonus	Equity-based	Misc.	Others	Total
GlaxoSmithKline plc	Jean-Pierre	Garnier	Male	60	8	1	0	911,554	0	1,364,309	13,700,000	0	763,490	16,700,000
Shire plc (OLD)	Matthew	Emmens	Male	56	5	0	0	582,186	0	1,049,546	5,357,139	0	212,025	7,200,896
AstraZeneca plc	David R	Brennan	Male	54	2	1	0	999,184	0	1,015,300	4,943,462	0	151,086	7,109,033
Phytopharm plc	Daryl	Rees	Male	47	1	1	0	181,401	0	77,000	2,014,572	0	16,778	2,289,751
Johnson Matthey plc	Neil	Carson	Male	51	4	1	0	630,000	0	573,000	959,999	0	29,000	2,191,999
Average								660,865	0	815,831	5,395,034	0	234,476	7,098,336
COMMUNICATIONS														
Vodafone Group plc	Arun	Sarin	Male	53	5	1	0	1,310,000	0	2,130,000	6,108,709	0	155,000	9,703,709
BT Group plc	Ben	Verwaayen	Male	56	6	0	0	792,000	0	2,301,000	2,966,123	0	53,000	6,112,123
Freedom4 Communications plc	Micheal	Read	Male	60	4	1	0	384,000	0	1,800,000	563,775	0	0	2,747,775
Inmarsat plc	Andrew	Sukawaty	Male	52	4	1	1	376,709	0	400,882	496,539	0	18,130	1,292,261
Thus Group plc	William	Allan	Male	54	9	1	0	435,120	0	209,075	602,140	0	21,147	1,267,482
Average								659,566	0	1,368,191	2,147,457	0	49,455	4,224,670
FINANCIAL														
Man Group plc	Peter	Clarke	Male	48	0	1	0	462,000	0	6,724,000	5,675,855	0	11,000	12,900,000
ICAP plc	Michael	Spencer	Male	53	9	1	0	360,000	0	7,675,000	2,838,647	0	5,817	10,900,000
F&C Asset Management plc	Alain	Grisay	Male	54	2	1	0	325,000	0	1,794,333	7,334,000	0	11,000	9,464,333
HSBC Holdings plc	Michael	Geoghegan	Male	54	2	1	0	1,040,000	0	1,915,000	5,013,237	0	61,000	8,029,237
Royal Bank of Scotland	Frederick	Goodwin	Male	49	8	1	0	1,290,000	0	2,860,000	3,717,474	0	40,000	7,907,474
Average								695,400	0	4,193,667	4,915,843	0	25,763	9,840,209

FOOD														
Company	First_name	Surname	Gender	Age	Tenure	Turn over	Chairman	Salary total	Fees total	Bonus	Equity-based	Misc.	Others	Total
Tesco plc	Terence	Leahy	Male	52	11	1	0	1,293,000	0	2,879,000	16,400,000	0	95,000	20,600,000
Diageo plc	Paul	Walsh	Male	53	8	1	0	1,087,000	0	1,188,000	6,166,799	0	39,000	8,480,799
J Sainsbury plc	Justin	King	Male	47	4	1	0	850,000	0	1,563,000	4,552,890	0	29,000	6,994,890
SABMiller plc	Ernest	Mackay	Male	59	9	1	0	1,020,000	0	1,606,000	3,943,875	0	310,055	6,879,930
British American Tobacco plc	Paul	Adams	Male	55	4	1	0	1,076,641	0	1,015,616	3,245,902	0	137,016	5,475,175
Average								1,065,328	0	1,650,323	6,861,893	0	122,014	9,686,159
IT														
Invensys plc	Ulf	Henriksson	Male	45	3	1	0	750,000	0	1,024,500	7,497,647	0	15,857	9,288,004
Misys plc	John	Lawrie	Male	55	2	1	0	570,000	0	1,026,000	2,097,433	0	31,681	3,725,114
Sage Group plc; The	Paul	Walker	Male	50	21	1	0	699,000	0	793,000	1,075,362	0	21,000	2,588,362
Logica plc	Martin Peter	Read	Male	58	14	0	0	503,000	0	0	1,505,673	0	29,000	2,037,673
Innovation Group plc; The	Hassan	Sadiq	Male	40	5	1	0	285,000	0	200,000	1,485,000	0	48,000	2,018,000
Average								561,400	0	608,700	2,732,223	0	29,108	3,931,431
LEISURE														
Sportech plc	Ian	Penrose	Male	42	2	1	0	281,000	0	420,000	4,350,000	0	16,000	5,067,000
Partygaming plc	Mitchell	Garber	Male	43	2	1	0	528,802	0	396,832	530,700	3,225,044	90,480	4,771,858
InterContinental Hotels Group plc	Andrew	Cosslett	Male	53	3	1	0	732,000	0	1,114,560	2,776,197	0	25,000	4,647,757
Domino's Pizza UK & Ireland plc	Stephen	Hemsley	Male	50	7	0	0	240,000	0	240,000	3,360,000	0	35,000	3,875,000
Thomas Cook Group plc	Manny	Fontenla-Novoa	Male	54	1	1	0	231,000	0	2,652,000	842,839	0	5,000	3,730,839
Average								402,560	0	964,678	2,371,947	645,009	34,296	4,418,491
LOGISTICS														
Galiform plc	Matthew	Ingle	Male	53	2	1	0	525,000	0	525,000	5,656,541	0	18,000	6,724,541
Clarkson plc	Richard	Fulford-Smith	Male	53	4	1	0	550,000	0	2,500,000	808,220	0	90,000	3,948,220
Bunzl plc	Michael	Roney	Male	54	2	1	0	725,000	0	556,000	2,076,675	0	28,900	3,386,575
Michael Page International plc	Stephen	Ingham	Male	45	2	1	0	360,000	0	1,533,000	1,277,626	0	22,000	3,192,626
Experian plc	Don	Robert	Male	49	2	1	0	704,977	0	704,977	1,138,076	0	473,845	3,021,876
Average								572,995	0	1,163,795	2,191,428	0	126,549	4,054,768

MEDIA														
Company	First_name	Surname	Gender	Age	Tenure	Turn over	Chairman	Salary total	Fees total	Bonus	Equity-based	Misc.	Others	Total
WPP Group plc	Martin	Sorrell	Male	63	22	0	0	1,003,000	0	1,650,000	5,448,569	0	35,000	8,136,569
Pearson plc	Marjorie	Scardino	Female	61	11	1	0	900,000	0	1,341,000	3,810,123	0	91,000	6,142,123
British Sky Broadcasting Group plc	Jeremy	Darroch	Male	47	1	1	0	675,029	0	1,216,250	3,629,200	0	17,132	5,537,611
Yell Group plc	John	Condron	Male	58	7	1	0	850,000	0	1,206,150	2,356,120	0	311,000	4,723,270
Reed Elsevier plc	Crispin	Davis	Male	59	8	1	0	1,135,680	0	1,267,419	2,076,728	0	28,137	4,507,964
Average								912,742	0	1,336,164	3,464,148	0	96,454	5,809,507
MINING & MANUFACTURING														
BHP Billiton plc	Marius	Kloppers	Male	47	1	1	0	842,571	0	907,285	15,200,000	0	37,323	17,000,000
Ferrexpo plc	Michael	Oppenheimer	Male	54	2	1	0	286,057	0	0	2,280,342	4,686,698	0	7,253,096
Rexam plc	Leslie	Van De Walle	Male	52	1	1	0	750,000	0	360,000	4,217,837	1,469,482	81,000	6,878,319
Tomkins plc	James	Nicol	Male	54	6	1	0	879,000	0	1,142,000	3,614,166	0	45,000	5,680,166
Gem Diamonds Ltd	Clifford	Elphick	Male	47	0	1	0	356,383	0	231,649	5,052,310	0	24,060	5,664,402
Average								622,802	0	528,187	6,072,931	1,231,236	37,477	8,495,197
OTHER (E.g., Health care equipment)														
Reckitt Benckiser Group plc	Bart	Becht	Male	51	8	1	0	912,000	0	3,257,000	26,700,000	0	112,000	31,000,000
Burberry Group plc	Angela	Ahrendts	Female	48	2	1	0	850,000	0	1,147,500	8,863,719	1,760,934	420,000	13,000,000
Eurasian Natural Resources Corp plc	Johannes	Sittard	Male	65	1	1	0	1,623,000	0	1,000,000	9,990,000	0	53,000	12,700,000
Shire plc	Matthew	Emmens	Male	56	5	0	0	582,186	0	1,049,546	5,354,655	0	212,025	7,198,412
Cadbury Schweppes plc	H	Stitzer	Male	56	5	1	0	862,000	0	1,715,000	2,060,791	0	666,000	5,303,791
Average								965,837	0	1,633,809	10,593,833	352,187	292,605	13,840,441
RETAILING														
Marks & Spencer Group plc	Stuart	Rose	Male	59	4	1	0	1,070,000	0	0	5,774,992	0	305,000	7,149,992
DSG International plc	John	Browett	Male	44	0	1	0	275,000	0	0	2,834,111	600,000	7,000	3,716,111
HMV Group plc	Simon	Fox	Male	47	2	1	0	493,000	0	498,000	2,376,596	0	1,000	3,368,596
Signet Group plc	Terry Lee	Burman	Male	62	8	1	0	792,014	0	0	2,048,197	0	55,375	2,895,586
Kingfisher plc	Gerard	Murphy	Male	52	5	0	0	925,700	0	326,000	1,380,138	0	57,468	2,689,306
Average								711,143	0	164,800	2,882,807	120,000	85,169	3,963,918

UTILITIES														
Company	First_name	Surname	Gender	Age	Tenure	Turn over	Chairman	Salary total	Fees total	Bonus	Equity-based	Misc.	Others	Total
Royal Dutch Shell plc	Jeroen	van der Veer	Male	60	10	0	0	1,305,176	0	2,122,106	14,300,000	0	23,463	17,700,000
BG Group plc	Frank	Chapman	Male	55	7	1	0	996,593	0	1,400,000	6,266,753	0	4,161	8,667,507
Dana Petroleum plc	Thomas	Cross	Male	47	13	1	0	588,000	0	1,764,000	4,527,650	0	65,000	6,944,650
BP plc	Anthony	Hayward	Male	51	1	1	0	877,000	0	1,262,000	3,616,312	0	14,000	5,769,312
Centrica plc	William	Laidlaw	Male	52	2	1	0	873,000	0	753,000	2,865,444	0	64,000	4,555,444
Average								927,954	0	1,460,221	6,315,232	0	34,125	8,727,383

Table R5 CEO total remuneration by size (index).

This table shows the CEOs' total remuneration by index membership over time. The data is nominal. Data source: Own calculations based on Manifest.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Average	Annual Increase
FTSE 100	955,869	1,038,242	1,120,791	1,299,045	1,514,746	2,028,255	2,311,766	2,679,007	3,286,194	3,242,778	3,670,274	4,437,831	2,334,128	15.30%
FTSE 250	415,895	504,910	496,427	482,648	1,191,443	750,820	1,009,197	1,115,332	1,560,428	1,295,518	1,412,776	1,551,190	998,383	19.41%
FTSE SmallCap	369,810	228,203	246,511	246,755	781,335	476,123	421,753	641,486	404,161	505,388	612,414	708,272	483,963	19.36%
FTSE Fledgling	125,901	133,963	137,530	165,358	241,735	318,374	210,233	208,834	231,710	332,479	295,162	273,020	234,954	9.84%

Figure R5. CEO remuneration across indices over the whole sample from 1996-2007

This figure compares the average total CEO compensation of firms listed in different indices.

Table T1. CEO characteristics: tenure, age, gender, and board duality

These panels summarize the individual characteristics of the CEOs. Panels A-D present the data on gender, age, tenure (in years), and board duality (are the functions of CEO and chairman of the board exerted by two different persons or by the CEO alone). N stands for the number of firm-years. The mean is the average value of the variable; SD stands for standard deviation. P25 and P75 are the values at the 25% and 75% quartiles, respectively. The exceptionally old CEO of 97 years is Gerald Ashfield who joined London and St Lawrence Investment Company plc in 1952. Data source: Own calculations based on Manifest.

Panel A. Male	N	Mean	SD	Min	P25	P50	P75	Max
CEO	13,289	0.981	0.137	0	1	1	1	1
Executive dirs. (excl CEO)	35,463	0.961	0.194	0	1	1	1	1
Non-executive dirs.	62,622	0.946	0.226	0	1	1	1	1
Panel B. Age								
CEO	13,289	53	8	26	47	53	58	97
Executive dirs. (excl CEO)	35,463	50	8	25	44	50	55	86
Non-executive dirs.	62,622	58	8	23	54	59	64	91
Panel C. Tenure								
CEO	13,289	6	7	0	1	4	8	51
Executive dirs. (excl CEO)	35,463	7	6	0	3	5	9	90
Non-executive dirs.	62,622	7	6	0	3	6	9	95

Figure T1. CEO turnover and tenure over the whole sample from 1996-2007

This figure depicts the trends in turnover, disciplinary turnover and tenure for CEOs over the whole sample period. The diamond curve and square curve stands for the turnover and disciplinary turnover trends, using vertical axis on the left. The circle curve shows the average CEO tenure over sample period, using vertical axis on the right.

Table T2 CEO turnover and contract notice period

Panel A presents basic statistics concerning CEO turnover. Panel B also shows the notice period of CEO contracts. The frequency/percentage columns gives how often a specific notification period is included in a CEO employment contract. Data source: Own calculations based on Manifest.

Panel A. Turnover, disciplinary turnover and deceased

Turnover	Frequency	Percentage
0	3290	23.75%
1	10564	76.25%
Deceased	Frequency	Percentage
1	152	1.1%
0	13,702	98.9%
Disciplinary turnover	Frequency	Percentage
0	1,438	10.38%
1	12,416	89.62%

Panel B. Notice period

Notice period (months)	Frequency	Percentage
0	27	0.27%
1	34	0.34%
2	12	0.12%
3	120	1.19%
4-6	801	7.93%
9	11	0.11%
11-12	7,775	76.96%
15	1	0.01%
16-18	83	0.82%
20-24	1,123	11.12%
36	106	1.05%
48	5	0.05%
60	5	0.05%
Total	13854	100%

Table T3. Board structure and board committees

This table gives an overview of the board composition and structure and of the board's committees. In Panel A, N is the number of observations. The mean is the average value of the variable; SD stands for standard deviation. P25 and P75 are the values at the 25% and 75% quartiles, respectively. Board size refers to the number of directors on the board. Percentage of executives is calculated as number of executives divided by board size. The number of males is the number of male directors on the board. Similarly, the Percentage of males is the number of males divided by the board size. The bottom row of Panel A shows the probability of having the CEO as chairman of the board. Panel B shows the frequency of occurrence of the three main board committees in UK listed firms. The denominator is the number of firm years: 13845). Panel C gives details on the staffing of the committees. The first row reports the size of the committee. The second row shows the proportion of committees with at least one executive presence in all firm years. The last row shows the average proportion of executives in the committee. Panel D shows the CEO's presence in the committees. Data source: Own calculations based on Manifest

Panel A

	Mean	SD	Min	P25	P50	P75	Max
Board size	7.89	3.41	1	6	7	10	26
Number of executive dirs.	3.35	2.26	0	2	3	5	18
Percentage of executive dirs	41%	15.0%	0%	25.0%	35.3%	45.5%	100%
Percentage of male dirs.	96%	8%	0%	92.0%	100%	100%	100%
CEO-Chairman duality	13.1	33.8%	0%	0%	0%	0%	100%

Panel B

Presence of Committee in listed firms (13854 firm-years)	Audit Committee	Nomination Committee	Remuneration Committee
Present	98.0%	80.1%	87.7%
Absent	0.5%	18.4%	10.8%
Unknown	1.5%	1.5%	1.5%

Panel C. Composition of Committee	Audit Committee	Nomination Committee	Remuneration Committee
Average committee size	3.81	4.30	3.80
Executive presence in the committee	17.7%	53.5%	20.2%
Proportion of executives in the committee	2.1%	14.7%	2.3%

Panel D. CEO presence in committees	Audit Committee	Nomination Committee	Remuneration Committee
No	80.7%	54.6%	88.8%
Yes as a Member	13.9%	32.5%	7.8%
Yes as the Chairman	3.9%	11.4%	1.9%
Unknown	1.5%	1.5%	1.5%

Table T4. CEO presence in committee by index.

This table provides information about CEO's presence (as member or chairman) in a committee for companies belonging to different indices. Data source: Own calculations based on Manifest.

	Audit Committee			
FTSE Index	FTSE 100 1276 firm-years	FTSE 250 3386 firm-years	FTSE Small Cap 4662 firm-years	FTSE Fledgling 2705 firm-years
No member	98.0%	87.9%	77.1%	69.2%
Member	1.8%	10.0%	17.8%	21.5%
Chairman	0.2%	2.0%	4.7%	8.1%
Unknown	0%	0.1%	0.4%	1.2%
	Nomination Committee			
No member	46.5%	44.3%	47.2%	60.2%
Member	47.0%	43.4%	37.9%	23.4%
Chairman	6.5%	12.2%	14.5%	15.2%
Unknown	0%	0.1%	0.4%	1.2%
	Remuneration Committee			
No member	97.3%	92.8%	90.3%	82.7%
Member	2.2%	6.3%	7.6%	11.6%
Chairman	0.5%	0.8%	1.7%	4.6%
Unknown	0%	0.1%	0.4%	1.2%

Table T5. Remuneration advisors

This table shows the top 10 remuneration advisors in UK listed companies. Frequency indicates the number of companies that advisor has been employed to advise in a certain field. For instance, Towers Perrin has been hired by 142 companies during the sample period 1996-2007. 'Internal advice' signifies that the company explicitly mentions not to have hired an external advisor but to rely on internal advice only. Data source: Own calculations based on Manifest.

Top 10 Remuneration advisor	Frequency	Percentage
New Bridge Street Consultants	376	15.3%
Towers Perrin	142	5.8%
Deloitte & Touche	121	4.9%
Watson Wyatt	117	4.8%
Monks Partnership	97	3.9%
Mercer Human Resource Consulting	86	3.5%
PricewaterhouseCoopers	58	2.4%
KPMG	56	2.3%
Kepler Associates	47	1.9%
Hewitt Bacon & Woodrow	41	1.7%
Internal Advice	561	22.8%
Total (excluding Internal Advice)	1141	46.3%

Table O1. Ownership concentration over time of all listed companies

This table shows how ownership concentration has developed over time. The numbers are based on all disclosed ownership stakes of 3% or more for all shareholder categories apart from the directors of whom all shareholdings are reported and included in this table. The share stake concentration of the executive directors includes that of the CEO. The table also shows share percentages owned by institutions, including banks, insurance companies, investment funds, pension funds, and of other outsiders such as corporations and individuals and families not related to a director. Data source: Own calculations based on Manifest

%	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	total
N	760	807	939	1078	1063	1103	1344	1386	1409	1398	11412
CEO	1.3%	2.4%	2.8%	3.1%	2.6%	2.6%	2.2%	2.7%	2.6%	2.2%	2.5%
Executive directors (incl. CEO)	2.6%	4.9%	5.5%	6.0%	4.8%	4.8%	4.1%	4.5%	4.9%	4.4%	4.7%
Non-executive directors	0.9%	1.8%	2.1%	2.8%	2.2%	2.2%	2.1%	2.2%	2.4%	2.4%	2.1%
Inside total	3.6%	6.7%	7.5%	8.8%	7.0%	7.0%	6.2%	6.6%	7.3%	6.8%	6.8%
Nominee accounts	0.7%	1.0%	1.1%	1.2%	1.1%	1.1%	1.3%	2.1%	2.2%	2.2%	1.5%
Institutions total	18.2%	19.1%	20.2%	21.6%	22.3%	22.7%	18.0%	20.9%	21.1%	22.3%	20.7%
Bank funds	2.9%	2.0%	1.4%	1.2%	1.5%	1.5%	1.6%	1.7%	1.8%	1.9%	1.7%
Insurance companies' funds	6.5%	6.6%	6.2%	4.4%	3.7%	3.6%	2.5%	2.5%	2.4%	2.4%	3.8%
Investment and mutual funds	8.5%	10.1%	12.1%	15.4%	16.4%	16.9%	13.3%	16.1%	16.4%	17.5%	14.7%
Pension funds	0.3%	0.4%	0.5%	0.7%	0.7%	0.8%	0.6%	0.6%	0.5%	0.5%	0.6%
Individuals and families	5.2%	1.6%	1.6%	1.8%	2.0%	1.8%	1.5%	1.6%	1.4%	1.3%	1.9%
Corporations	9.9%	9.0%	7.6%	6.9%	7.2%	7.1%	6.0%	7.6%	7.9%	9.3%	7.8%
Outside total	34.0%	30.7%	30.5%	31.4%	32.5%	32.7%	26.8%	32.0%	32.7%	35.1%	31.8%

Table O2. Ownership concentration across indices

This table presents the ownership difference for firms belonging to indices (FTSE100, FTSE250, FTSE Small Cap, and FTSE Fledgling). The numbers are based on all disclosed ownership stakes of 3% or more for all shareholder categories apart from the directors of whom all shareholdings are reported and included in this table. The share stake concentration of the executive directors includes that of the CEO. The table also shows share percentages owned by institutions, including banks, insurance companies, investment funds, pension funds, and of other outsiders such as corporations and individuals and families not related to a director. Data source: Own calculations based on Manifest.

	FTSE 100	FTSE 250	FTSE Small Cap	FTSE Fledgling
N	1049	2833	3967	2315
CEO	0.3%	1.5%	2.5%	3.2%
Executive directors (incl. CEO)	1.1%	3.1%	4.7%	5.7%
Non-executive directors	0.2%	1.5%	2.0%	3.1%
Inside total	1.3%	4.6%	6.7%	8.7%
Nominee accounts	0.8%	0.6%	1.2%	1.5%
Institutions total	12.2%	21.2%	24.7%	25.3%
Bank funds	1.8%	2.1%	1.8%	1.6%
Insurance companies' funds	2.3%	5.2%	5.2%	3.5%
Investment and mutual funds	8.0%	13.5%	16.9%	19.1%
Pension funds	0.1%	0.3%	0.7%	1.1%
Individuals and families	0.8%	1.1%	1.9%	3.2%
Corporations	5.9%	6.9%	8.2%	9.3%
Outside total	19.7%	29.8%	35.9%	39.2%

Table O3. Ownership concentration by sector

This table shows company ownership structure in different sectors according to the broad sector classification shown above. The numbers are based on all disclosed ownership stakes of 3% or more for all shareholder categories apart from the directors of whom all shareholdings are reported and included in this table. The share stake concentration of the executive directors includes that of the CEO. The table also shows share percentages owned by institutions, including banks, insurance companies, investment funds, pension funds, and of other outsiders such as corporations and individuals and families not related to a director. Data source: Own calculations based on Manifest.

(All in percentage)	Chemical	Communi- cation	Financial	Food	IT	Leisure	Logistics	Media	Mining& Manufac- ture	Other	Retailer	Utility
CEO	1.9%	5.2%	3.1%	1.2%	4.3%	2.1%	2.9%	2.7%	1.7%	1.2%	5.2%	1.7%
Exec	4.1%	6.2%	5.7%	2.8%	8.0%	4.2%	4.8%	7.7%	3.4%	2.1%	9.7%	3.7%
Nonexec	2.1%	1.0%	2.1%	1.8%	3.2%	3.0%	2.5%	2.1%	1.8%	1.4%	3.2%	2.3%
Inside total	6.2%	7.2%	7.8%	4.6%	11.2%	7.3%	7.3%	9.8%	5.2%	3.4%	12.9%	6.0%
Nominee accounts	1.2%	1.2%	0.9%	0.7%	1.6%	0.9%	1.1%	2.0%	2.1%	1.7%	1.7%	1.9%
Institution total	19.5%	14.6%	21.3%	16.2%	20.2%	19.7%	22.5%	19.7%	20.5%	22.4%	18.7%	17.9%
Bank	1.5%	1.4%	1.6%	1.0%	1.5%	2.1%	1.8%	1.4%	1.9%	2.0%	1.6%	1.3%
Insurance companies	2.8%	1.6%	4.8%	2.9%	2.9%	3.1%	3.8%	2.4%	4.2%	4.6%	3.2%	2.7%
Investment funds	15.0%	11.5%	14.4%	12.1%	15.4%	14.2%	16.5%	15.7%	14.1%	14.6%	13.8%	13.7%
Pension funds	0.3%	0.2%	0.6%	0.2%	0.4%	0.3%	0.4%	0.2%	0.4%	1.2%	0.1%	0.2%
Individual	1.3%	1.0%	1.8%	3.3%	2.3%	2.7%	2.2%	2.3%	1.7%	1.3%	3.5%	0.9%
Industrial companies	8.3%	12.4%	7.8%	8.5%	6.3%	10.2%	6.5%	11.8%	8.1%	6.8%	8.5%	9.5%
Outside total	30.4%	29.2%	31.9%	28.7%	30.3%	33.4%	32.3%	35.7%	32.4%	32.2%	32.5%	30.3%

Table S1. Summary statistics of centrality measures (company level)

This table summarizes the key centrality statistics (degree, closeness, betweenness and eigenvector centrality) of the companies in the sample. N stands for is the number of observations (firm-years). Note that the number of observations is smaller for the closeness measure as closeness measure cannot be calculated for isolated (non-networked) companies. SD stands for standard deviation. P25, P50 and P75 are the values at the 25th, 50th, and 75th percentile. The summary statistics are calculated over all firm-years. Below each centrality measure is the normalized version denoted by “n”. The centrality measures are calculated using Matlab and Ucinet. Data source: Own calculations based on Manifest.

Variable	N	Mean	SD	Min	P25	P50	P75	Max
degree	13854	4.02	3.88	0.00	1.00	3.00	6.00	29.00
(n) degree	13854	0.35	0.36	0.00	0.09	0.26	0.52	3.49
close	11319	448,512	381,822	133,702	247,103	290,541	617,579	2,340,900
(n) closeness	11319	0.36	0.14	0.07	0.25	0.40	0.43	0.59
eigen	13854	0.01	0.03	0.00	0.00	0.00	0.02	0.36
(n) eigen	13854	1.94	3.68	0.00	0.00	0.48	2.25	50.23
between	13854	1,402.96	2,359.46	0.00	0.00	349.90	1,838.89	28,711.68
(n) between	13854	0.20	0.34	0.00	0.00	0.05	0.27	5.52

Table S2. Summary statistics of centrality measures (company level) by year

This table presents the annual average centrality measures on the company level over the sample period. In the first column are the names of different centrality measures, namely, degree, closeness, betweenness and eigen vector centrality. Below each centrality measure is the normalized version, denoted by “n”. The centrality measures are calculated using Matlab and Ucinet. Data source: Own calculations based on Manifest.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
degree	3.99	4.11	4.25	4.11	4.16	4.40	4.28	4.20	4.01	3.77	3.71	3.63
(n) degree	0.53	0.49	0.46	0.42	0.39	0.39	0.38	0.37	0.29	0.26	0.24	0.24
close	156,205	166,495	202,946	233,054	306,080	321,953	324,680	351,209	566,905	709,816	728,352	802,400
(n) closeness	0.53	0.56	0.53	0.48	0.41	0.40	0.39	0.38	0.28	0.23	0.24	0.22
eigen	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
(n) eigen	2.48	2.61	2.37	2.32	2.04	2.10	2.35	1.79	1.83	1.74	1.52	1.13
between	773.68	952.25	1,095.47	1,177.41	1,222.66	1,302.45	1,287.51	1,347.33	1,679.10	1,611.80	1,845.24	1,718.78
(n) between	0.28	0.28	0.26	0.24	0.22	0.20	0.21	0.20	0.17	0.15	0.16	0.15

Table S3. Summary statistics of centrality measures (company level) by company size

The table below shows the centrality difference by firm size as proxied by index membership. In the first row are the names of different centrality measures, namely, degree, closeness, betweenness and eigenvector centrality. Below each centrality measure is the normalized version denoted by “n”. The centrality measures are calculated using Matlab and Ucinet. Data source: Own calculations based on Manifest.

	degree	(n) degree	closeness	(n) closeness	eigen	(n) eigen	between	(n) between
FTSE 100	9.29	0.85	346,261	0.40	0.05	6.69	3,918.76	0.62
FTSE 250	5.63	0.50	364,221	0.39	0.02	2.75	2,158.92	0.31
FTSE SmallCap	3.64	0.32	403,238	0.38	0.01	1.45	1,136.87	0.16
FTSE Fledgling	2.62	0.22	432,451	0.36	0.01	1.08	696.77	0.10

Table S4. Network component structure (company level) by year

This table lists the average network component statistics over the sample period. Nr of obs. is the number of observations in each year. Density evaluates how many links actually exist on top of the theoretical maximum number of links in the graph. N link is the number of links present in that year. NC>3 gives the number of components with size above three in that year. Max C is the size of the biggest component in that year. These statistics are calculated using Matlab and Ucinet. Data source: Own calculations based on Manifest.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Nr of obs.	749	832	915	984	1,065	1,133	1,117	1,151	1,400	1,449	1,528	1531
Density	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.002	0.002
N link	2990	3418	3888	4046	4434	4980	4780	4834	5610	5466	5676	5562
N C>3	6	3	8	4	7	5	7	5	9	11	9	11
Max C	573	664	739	786	836	896	877	902	1066	1052	1127	1101

Table S5. Network component structure (company level) by sector

This table shows the component structure information by sector in 2007. In the first row, N link is the number of links present in that year. Degree (avg.) is the average degree of all companies. N C>3 gives the number of components with a size above three. Max C is the size of the biggest component. The centrality measures and structure statistics are calculated using Matlab and Ucinet. Data source: Own calculations based on Manifest.

	N link	Density	Degree(avg.)	Degree (sum)	N C> 3	max C
Financial	202	0.0057	1.15	232	5	75
IT	197	0.0043	0.84	166	13	25
Logistics	148	0.0041	0.61	90	7	17
Energy	111	0.0051	0.56	62	7	6
Industry	105	0.0029	0.31	32	3	6
Medical	87	0.0094	0.81	70	4	13
Leisure	78	0.0060	0.46	36	3	5
Media	75	0.0054	0.40	30	4	3
Mining	73	0.0095	0.69	50	3	12
Retail	66	0.0061	0.39	26	4	4
Food	45	0.0121	0.53	24	2	4

Table S6. Networks of remuneration consultants

This table shows the number of remuneration consultant links by company and by year. If a company does not hire a remuneration consultant, the value equals zero. If a company has more than one remuneration consultants, the sum of the links from the consultants is taken. Data source: Own calculations based on Manifest.

	Mean	SD	Min	P25	P50	P75	Max
1996	19	37	0	0	0	24	218
1997	19	37	0	0	0	22.5	218
1998	18	35	0	0	0	18.5	218
1999	19	35	0	0	0	20	220
2000	19	36	0	0	0	24	222
2001	23	40	0	0	0	31	242
2002	55	76	0	0	11	94	434
2003	79	94	0	0	36	152	554
2004	59	81	0	0	2	123	382
2005	53	74	0	0	0	136	324
2006	46	66	0	0	0	96	291
2007	39	60	0	0	0	60	276
total	40	65	0	0	0	63	554

Appendix A . Variable definitions

Variable	Description	Source
<i>Remuneration</i>		
Total	Sum of all remuneration items listed below.	Own calculations based on Manifest
Salary	Fixed remuneration paid to executive directors	Manifest
Fee	Fixed remuneration mainly paid to non-executive directors.	Manifest
Bonus	Performance-related remuneration paid out annually	Manifest
Equity-based compensation	Remuneration paid as restricted shares and stock options (valued by means of Black-Scholes formula)	Own calculations based on Manifest
Miscellaneous	Sum of transaction bonus, deferred cash bonus, severance pay, recruitment incentive and relocation fee	Own calculations based on Manifest
Other	Sum of rare remuneration components such as e.g. medical insurance	Manifest
<i>Performance indicator</i>		
Return on asset	Net income prior to financing costs divided by total assets then multiplied by 100.	Datastream
Market-adjusted stock return	Annual stock return minus the return of the FT All Share index	Own calculations based on Datastream
<i>Centrality measure</i>		
Degree (ndegree)	Number of links of a vertex.(normalized degree)	Own calculations based on Manifest
Closeness (ncloseness)	The inverse of the geodesic distance from a vertex to all reachable vertices. (normalized closeness)	Own calculations based on Manifest
Betweenness (nbetweenness)	The probability that a specific vertex is on the geodesic path between any other two vertices. (normalized betweenness)	Own calculations based on Manifest
Eigenvector centrality (neigenvector)	The aggregation of centralities of adjacent vertices. (normalized eigenvector)	Own calculations based on Manifest
<i>CEO information</i>		
Gender (male)	Equals 1 if male and 0 if female.	Manifest
Tenure	Number of years in current position	Own calculations based on Manifest
Committee membership	Equals 2 if chairman of a specific committee, 1 if member, 0 if not member.	Own calculations based on Manifest
Chairmanship-CEO duality	Equals 1 if the target CEO is also the chairman of the board, 0 otherwise.	Manifest
Notice period	A minimum period a CEO must stay on post after giving his notice to his employer	Manifest
<i>Board composition</i>		
Prop. nonexecutive	Proportion of non-executive directors on board (denominator is total board size)	Own calculations based on Manifest
Prop. female	Proportion by female directors on board (denominator is total board size)	Own calculations based on Manifest
<i>Remuneration consultant networks</i>		
Size remuneration consultant network	The number of firms to which a remuneration consultant gives advice	Own calculations based on Manifest
<i>Ownership structure</i>		
CEO stock holding	All the CEO's stock holdings.	Own calculations based on Manifest

Executive stock holding	The sum of all executive directors' stock holdings.	Own calculations based on Manifest
Non executive stock holding	The sum of all non-executive directors' stock holdings.	Own calculations based on Manifest
Nominee account block holding	The sum of the share stakes of 3% or more on nominee accounts.	Own calculations based on Manifest
Institutional block holding	The sum of the share stakes of 3% or more held by banks, insurance companies, pension funds and investment, and mutual funds.	Own calculations based on Manifest
Corporate block holding	The sum of the share stakes of 3% or more held by industrial or commercial firms.	Own calculations based on Manifest
Individual block holding	The sum of the share stakes of 3% or more held by individuals or families not related to a director.	Own calculations based on Manifest
<i>Firm size, Capital structure and risk</i>		
Total assets	Sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets, except for financial companies.	Datastream
Debt to asset ratio	Sum of short term debt, current portion of long term debt and long term debt divided by total assets then multiplied by 100, except for financial companies.	Datastream
Stock price volatility	The stock's average annual price movement to a high and low from a mean price for each year: $(\text{high}-\text{low})/(\text{high}+\text{low})$.	Own calculations based on Datastream

Appendix B. Top manager identification procedure

For most firm-years in our sample, we have one unique CEO who serves as the top manager of the firm. Sometimes, however, two CEO are present, often at times prior to the departure of one CEO. In some small companies, we have no CEO but only managing director. For those firm-years, we use the following procedure to identify the non-CEO top manager, or the so-called CEO equivalent. We first check whether there is a CEO in the firm-year. If the answer is no, we take as CEO, the managing director, and in case there is no managing director, the executive chairman. If there are multiple managers present, we check how many of them remain in the company until the end of the year. If only one remains, he will be identified as the CEO/CEO-equivalent. This solves most of the multiple CEO cases. If more than one stay until year end, or all depart before the year end, we rely on their compensation level and choose the best paid CEO/CEO-equivalent. If they receive same pay, we pick one of them randomly and include him in our CEO sample. (In the graph, a star denotes a successful identification of CEO or CEO-equivalent which terminates the procedure).

Figure Appendix B. This diagram shows the procedure of identifying the CEO or CEO equivalents in each firm-year.

Appendix C. Sector classification

Panel A shows the sector classification as obtained from Datastream and the frequency gives the number of firm-years that can be categorized in a specific sector. Panel B gives sector information for the year 2007. Panel C shows broad sector distribution in whole sample as well as 2007.

Panel A

(whole sample)	Frequency	Percentage	Sector	Frequency	Percentage
Aerospace & Defense	152	1.37	Industrial Metals & Mining	40	0.36
Alternative Energy	54	0.49	Industrial Transportation	233	2.1
Automobiles & Parts	62	0.56	Leisure Goods	94	0.85
Banks	126	1.14	Life Insurance	101	0.91
Beverages	97	0.87	Media	664	5.98
Chemicals	199	1.79	Mining	329	2.97
Construction & Materials	332	2.99	Mobile Telecommunications	40	0.36
Electricity	86	0.78	Nonlife Insurance	231	2.08
Electronic & Electrical Equipm	313	2.82	Oil & Gas Producers	337	3.04
Equity Investment Instruments	26	0.23	Oil Equipment & Services	92	0.83
Financial Services (Sector)	648	5.84	Personal Goods	149	1.34
Fixed Line Telecommunications	132	1.19	Pharmaceuticals & Biotechnolog	456	4.11
Food & Drug Retailers	137	1.23	Real Estate Investment & Servi	422	3.8
Food Producers	241	2.17	Real Estate Investment Trusts	168	1.51
Forestry & Paper	26	0.23	Software & Computer Services	945	8.52
Gas, Water & Multiutilities	122	1.1	Support Services	1,193	10.75
General Industrials	142	1.28	Technology Hardware & Equipmen	318	2.87
General Retailers	656	5.91	Tobacco	35	0.32
Health Care Equipment & Servic	228	2.05	Travel & Leisure	725	6.53
Household Goods & Home Constr	345	3.11	Unclassified	16	0.14
Industrial Engineering	384	3.46			

Panel B

(2007)	Frequency	Percentage	Sector	Frequency	Percentage
Aerospace & Defense	14	1.2	Industrial Metals & Mining	9	0.77
Alternative Energy	11	0.95	Industrial Transportation	16	1.38
Automobiles & Parts	4	0.34	Leisure Goods	6	0.52
Banks	11	0.95	Life Insurance	11	0.95
Beverages	6	0.52	Media	73	6.28
Chemicals	15	1.29	Mining	67	5.76
Construction & Materials	23	1.98	Mobile Telecommunications	4	0.34
Electricity	11	0.95	Nonlife Insurance	21	1.81
Electronic & Electrical Equipm	30	2.58	Oil & Gas Producers	60	5.16
Equity Investment Instruments	5	0.43	Oil Equipment & Services	13	1.12
Financial Services (Sector)	87	7.48	Personal Goods	11	0.95
Fixed Line Telecommunications	8	0.69	Pharmaceuticals & Biotechnolog	51	4.39
Food & Drug Retailers	8	0.69	Real Estate Investment & Servi	52	4.47
Food Producers	24	2.06	Real Estate Investment Trusts	19	1.63
Forestry & Paper	2	0.17	Software & Computer Services	97	8.34
Gas, Water & Multiutilities	8	0.69	Support Services	137	11.78
General Industrials	15	1.29	Technology Hardware & Equipmen	36	3.1
General Retailers	51	4.39	Tobacco	3	0.26
Health Care Equipment & Servic	27	2.32	Travel & Leisure	63	5.42
Household Goods & Home Constr	19	1.63	Unclassified	1	0.09
Industrial Engineering	34	2.92			

Panel C

	Frequency (Whole sample)	Percentage (Whole sample)	Frequency (2007)	Percentage (2007)
Chemical	655	4.73	66	4.31
Communication	172	1.24	12	0.78
Financial	1,722	12.43	206	13.46
Food	510	3.68	41	2.68
It	1,670	12.05	169	11.04
Leisure	725	5.23	63	4.11
Logistics	1,426	10.29	153	9.99
Media	664	4.79	73	4.77
Manufacture	1,467	10.59	168	10.97
Other	3,496	25.23	426	27.82
Retailer	656	4.74	51	3.33
Utility	691	4.99	103	6.73

Appendix D: CEO, executive and non-executive director remuneration by corporate size

Table D1. FTSE 100 CEO remuneration

This table shows the CEO total remuneration and its components for FTSE100 companies. N is the number of observations (firm-years). Mean stands for the average value; SD is the standard deviation. P25 and P75 are the value at the first and third quartile, respectively. Percent captures the percentage of the total remuneration that is awarded via this type of remuneration. The values in bold are unconditional statistics, which takes into account all variables with a zero value. The other values are conditional statistics based on non-zero values only. N (the number of observations) always equals to maximum number of observations possible for the unconditional statistics. The N for the conditional statistics is the number of firm years when a certain type of remuneration is actually given. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	1276	553802	261108	0	390000	537749	711686	2147200	23.73%
Salary cash	344	707690	242201	2692	550000	707000	864522	1531000	
Salary shares	3	2997	4	2993	2993	2997	3000	3000	
Total fees	1276	4536	138522	0	0	0	0	4939000	2.20%
Fees cash	0	.	.	.	.	.	.	.	
Fees shares	0	.	.	.	.	.	.	.	
Total bonus	1276	506949	766244	0	100000	264107	619141	8451275	21.72%
Bonus cash	1046	517928	680161	3365	159000	307100	623000	7351275	
Bonus shares	15	334269	424955	2658	60000	230000	518923	1715000	
Bonus vdf	22	490862	354101	76760	204220	406000	666908	1259370	
Bonus mdf	149	545083	616004	18750	173962	335187	630000	3837500	
Total equity	1,276	1,174,156	2,260,997	0	0	475,002	1,351,518	26,700,000	50.30%
Restricted share	725	1,373,217	2,180,412	330	303,298	702,884	1,640,211	26,700,000	
Stock option	527	953,777	1,675,824	0	264,003	500,386	1,008,102	23,400,000	
Total misc	1276	15217	131543	0	0	0	0	3062944	0.65%
Transaction Bonus	2	929000	1231780	58000	58000	929000	1800000	1800000	
Deferred Cash Bonus	17	264845	175277	16000	152069	218750	470878	505039	
Loss of Office	10	595993	341766	103000	403799	588500	875000	1057971	
Recruitment Incentive	6	858101	1194629	4556	53737	342500	1342372	3062943	
Reallocation expenses	10	194830	146358	39479	99836	130055	259749	447469	
Others	1276	79468	238881	0	14702	25330	62000	6624000	3.40%
Overall total	1,276	2,334,128	2,812,143	0	796,093	1,442,278	2,853,719	31,000,000	100%

Table D2. FTSE 100 Executive remuneration (excluding the CEO)

This table shows the CEO total remuneration and its components for FTSE100 companies. N is the number of observations (firm-years). Mean stands for the average value; SD is the standard deviation. P25 and P75 are the value at the first and third quartile, respectively. Percent captures the percentage of the total remuneration that is awarded via this type of remuneration. The values in bold are unconditional statistics, which takes into account all variables with a zero value. The other values are conditional statistics based on non-zero values only. N (the number of observations) always equals to maximum number of observations possible for the unconditional statistics. The N for the conditional statistics is the number of firm years when a certain type of remuneration is actually given. Source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	5825	303,739	182,630	0	188,387	281,000	390,000	2,609,000	29.56%
Salary cash	1122	394,410	196,378	954	270,000	381,000	500,000	2,609,000	
Salary shares	6	2,997	3	2,993	2,993	2,997	3,000	3,000	
Total fees	5825	976	13,433	0	0	0	0	483,000	0.09%
Fees cash	5	214,685	182,891	8,000	93,696	207,731	281,000	483,000	
Fees shares	0								
Total bonus	5825	220,285	480,961	0	21,000	101,000	244,000	17,900,000	21.44%
Bonus cash	4522	245,326	411,154	0	68,031	135,000	266,000	10,400,000	
Bonus shares	45	101,884	102,691	0	18,000	75,000	162,930	362,376	
Bonus vdf	81	214,615	203,956	0	72,000	177,000	295,000	939,000	
Bonus mdf	479	284,823	601,263	0	78,000	148,000	322,000	11,400,000	
Total equity	5825	428,194	1,699,809	0	0	143,323	494,998	112,000,000	41.67%
Restricted share	2661	607,241	2,321,240	25	122,497	323,409	664,998	112,000,000	
Stock option	2149	408,730	771,622	0	139,740	251,583	455,881	25,100,000	
Total misc	5825	21,751	219,060	0	0	0	0	10,700,000	2.12%
Transaction Bonus	10	289,130	172,387	80,000	200,000	207,500	415,000	645,000	
Deferred Cash Bonus	46	142,339	155,792	4,000	34,000	77,175	219,605	545,901	
Loss of Office	139	782,251	1,140,080	0	331,003	515,000	790,000	10,700,000	
Recruitment Incentive	17	440,728	791,155	1,245	100,000	233,000	400,000	3,408,000	
Reallocation expenses	15	69,047	71,116	4,870	19,722	35,917	95,558	259,749	
Others	5825	52,674	192,396	0	10,000	17,000	34,000	9,538,471	5.13%
Overall total	5825	1,027,620	1,957,499	0	356,000	649,908	1,231,688	112,000,000	100%

Table D3 FTSE 100 non-executives' remuneration

Table 4.3.8 shows non- executives' total remuneration and its components of FTSE100 companies. N is the number of observations (firm-years). Mean stands for the average value; SD is the standard deviation. P25 and P75 are the value at the first and third quartile, respectively. Percent captures the percentage of the total remuneration that is awarded via this type of remuneration. The values in bold are unconditional statistics, which takes into account all variables with a zero value. The other values are conditional statistics based on non-zero values only. N (the number of observations) always equals to maximum number of observations possible for the unconditional statistics. The N for the conditional statistics is the number of firm years when a certain type of remuneration is actually given. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	9962	3,483	37,609	0	0	0	0	1,065,526	4.74%
Salary cash	7	245,754	192,981	53,091	80,862	212,037	407,545	570,322	
Salary shares	0	.	.	.	.	.	.	.	
Total fees	9962	57,560	71,895	0	25,000	37,500	60,000	1,100,000	78.33%
Fees cash	2605	85,945	94,483	0	44,000	58,113	85,000	1,100,000	
Fees shares	98	24,534	30,740	0	7,500	20,000	25,000	175,000	
Total bonus	9962	2,012	63,995	0	0	0	0	5,531,744	2.74%
Bonus cash	72	253,941	616,916	601	25,000	87,750	201,593	4,811,743	
Bonus shares	0	.	.	.	.	.	.	.	
Bonus vdf	0	.	.	.	.	.	.	.	
Bonus mdf	5	352,259	288,804	45,780	72,706	426,100	496,707	720,000	
Total equity	9962	5,414	114,361	0	0	0	0	6,662,728	7.37%
Restricted share	36	978,319	1,138,193	1,506	285,112	486,473	1,096,970	4,243,383	
Stock option	64	292,496	582,766	0	57,402	115,958	241,039	3,393,328	
Total misc	9962	493	18,975	0	0	0	0	1,230,000	0.67%
Transaction Bonus	0	.	.	.	.	.	.	.	
Deferred Cash Bonus	1	35,000	.	35,000	35,000	35,000	35,000	35,000	
Loss of Office	11	443,295	377,643	23,000	105,678	403,799	628,528	1,230,000	
Recruitment Incentive	0	.	.	.	.	.	.	.	
Reallocation expenses	0	.	.	.	.	.	.	.	
Others	9962	4,520	105,982	0	0	0	0	9,157,000	6.15%
Overall total	9962	73,483	211,035	0	25,000	39,508	65,000	9,188,000	100%

Table D4. FTSE 250 CEO remuneration

Table 4.3.9 shows CEO total remuneration and its components of FTSE250 companies. N is the number of observations (firm-years). Mean stands for the average value; SD is the standard deviation. P25 and P75 are the value at the first and third quartile, respectively. Percent captures the percentage of the total remuneration that is awarded via this type of remuneration. The values in bold are unconditional statistics, which takes into account all variables with a zero value. The other values are conditional statistics based on non-zero values only. N (the number of observations) always equals to maximum number of observations possible for the unconditional statistics. The N for the conditional statistics is the number of firm years when a certain type of remuneration is actually given. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	3386	285,105	184,419	0	170,000	295,000	400,000	2,400,000	28.56%
Salary cash	785	409,363	149,932	2,692	318,475	400,000	487,600	1,147,945	
Salary shares	0								
Total fees	3386	3,246	15,269	0	0	0	0	337,000	0.34%
Fees cash	105	40,880	40,270	4,000	24,000	27,500	35,000	221,000	
Fees shares	0								
Total bonus	3386	194,164	398,354	0	0	85,250	236,539	5,740,000	19.45%
Bonus cash	2277	251,498	363,406	130	77,000	153,000	291,000	4,500,000	
Bonus shares	28	259,592	386,716	41,824	100,256	136,559	199,500	1,968,750	
Bonus vdf	39	237,555	247,029	12,680	76,760	159,000	340,000	1,312,500	
Bonus mdf	183	298,009	422,037	2,296	92,000	166,000	300,000	2,870,000	
Total equity	3,386	467,380	4,191,657	0	0	26,802	367,290	186,841,117	46.81%
Restricted share	1,150	823,644	4,270,988	330	174,998	361,302	652,041	134,000,000	
Stock option	929	782,499	9,267,125	0	124,516	221,358	397,114	186,841,117	
Total misc	3386	14,060	182,179	0	0	0	0	6,333,880	1.41%
Transaction Bonus	13	1,085,083	1,316,301	58,000	156,250	505,104	1,760,934	4,686,697	
Deferred Cash Bonus	27	410,860	1,201,322	8,000	49,000	117,413	267,347	6,333,880	
Loss of Office	16	650,106	432,912	103,000	382,418	464,875	838,434	1,544,745	
Recruitment Incentive	13	899,279	1,044,107	150,000	350,000	508,055	735,514	3,225,044	
Reallocation expenses	4	79,277	59,181	35,000	39,338	58,838	119,216	164,431	
Others	3386	34,429	90,292	0	3,807	16,000	27,000	2,179,000	3.45%
Overall total	3,386	998,383	4,273,865	0	274,000	561,655	1,060,530	186,879,117	100%

Table D5. FTSE 250 Executive remuneration (excluding the CEO)

Table 4.3.10 shows non-CEO executives' total remuneration and its components of FTSE250 companies. N is the number of observations. Mean is the average value of the variable. SD stands for standard deviation. Min and Max are the minimum and maximum value of the item. P25 and P75 are the value at 25% quantile and 75% quantile respectively. The percentage at the last column is how many percent of total remuneration is awarded in that type of remuneration. All the values are unconditional. Data source: Own calculations based on data from Manifest and Datastream.

variable	N	mean	sd	min	p25	Median	p75	max	Percent
Total salary	11091	186,054	109,602	0	115,454	176,000	245,000	2,045,400	32.97%
Total fees	11091	738	12,466	0	0	0	0	575,000	0.13%
Total bonus	11091	108,542	259,380	0	0	47,000	121,000	9,925,000	19.23%
Total equity	11091	227,703	2,583,158	0	0	8,019	178,725	209,000,000	40.35%
Total misc	11091	13,577	126,150	0	0	0	0	6,076,200	2.41%
Others	11091	27,771	123,546	0	6,706	13,000	21,000	9,538,471	4.92%
Overall total	11091	564,386	2,621,771	0	194,200	338,335	592,000	209,000,000	100%

Table D6. FTSE 250 non-executives' remuneration

Table 4.3.11 shows non-executives' total remuneration and its components of FTSE250 companies. N is the number of observations. Mean is the average value of the variable. SD stands for standard deviation. Min and Max are the minimum and maximum value of the item. P25 and P75 are the value at 25% quantile and 75% quantile respectively. The percentage at the last column is how many percent of total remuneration is awarded in that type of remuneration. All the values are unconditional. Data source: Own calculations based on data from Manifest and Datastream.

variable	N	mean	sd	min	p25	Median	p75	max	Percent
Total salary	18775	1,758	21,259	0	0	0	0	875,000	4.16%
Total fees	18775	34,250	37,761	0	15,000	25,000	38,000	705,000	81.03%
Total bonus	18775	1,129	24,265	0	0	0	0	1,800,000	2.67%
Total equity	18775	2,516	68,065	0	0	0	0	6,662,728	5.95%
Total misc	18775	832	95,401	0	0	0	0	13,100,000	1.97%
Others	18775	1,784	20,609	0	0	0	0	1,111,942	4.22%
Overall total	18775	42,269	142,559	0	16,000	26,000	40,000	14,300,000	100%

Table D7. FTSE SmallCap CEO remuneration

Table 4.3.12 shows CEO total remuneration and its components of FTSE SmallCap companies. N is the number of observations (firm-years). Mean stands for the average value; SD is the standard deviation. P25 and P75 are the value at the first and third quartile, respectively. Percent captures the percentage of the total remuneration that is awarded via this type of remuneration. The values in bold are unconditional statistics, which takes into account all variables with a zero value. The other values are conditional statistics based on non-zero values only. N (the number of observations) always equals to maximum number of observations possible for the unconditional statistics. The N for the conditional statistics is the number of firm years when a certain type of remuneration is actually given. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	4662	166,136	139,268	0	0	170,000	250,000	2,248,685	34.33%
Salary cash	852	274,444	140,894	1,846	200,133	270,000	330,000	2,248,685	
Salary shares	2	5,000	0	5,000	5,000	5,000	5,000	5,000	
Total fees	4662	4,946	20,826	0	0	0	0	992,673	1.02%
Fees cash	342	27,009	23,719	2,000	19,500	23,000	27,000	237,118	
Fees shares	1	755,555		755,555	755,555	755,555	755,555	755,555	
Total bonus	4662	71,821	150,015	0	0	7,488	95,000	2,500,000	14.84%
Bonus cash	2364	135,212	178,816	623	44,000	90,000	165,000	2,500,000	
Bonus shares	15	103,320	125,764	3,000	41,200	63,654	122,057	510,000	
Bonus vdf	19	97,092	70,247	6,445	55,000	90,000	118,025	337,500	
Bonus mdf	65	123,245	133,262	3,000	52,286	84,500	138,000	835,000	
Total equity	4,662	216,148	3,291,035	0	0	0	51,864	186,841,117	44.66%
Restricted share	713	526,324	2,150,374	2	120,666	234,242	376,623	47,600,000	
Stock option	715	1,012,584	11,200,000	0	69,124	144,588	272,851	186,841,117	
Total misc	4662	5,438	67,145	0	0	0	0	2,057,000	1.12%
Transaction Bonus	7	651,943	775,097	49,428	60,500	187,671	1,246,000	2,057,000	
Deferred Cash Bonus	20	234,708	382,432	573	100,125	138,000	209,750	1,818,000	
Loss of Office	29	467,742	351,000	125,000	248,000	390,000	470,000	1,544,745	
Recruitment Incentive	10	227,846	198,186	48,000	87,500	137,500	400,000	600,000	
Reallocation expenses	5	49,946	40,543	14,002	25,915	36,813	56,000	117,000	
Others	4662	19,474	58,362	0	0	10,920	19,000	1,396,000	4.02%
Overall total	4,662	483,963	3,308,147	0	40,000	254,056	486,003	186,879,117	100.00%

Table D8. FTSE SmallCap Executive remuneration (excluding the CEO)

Table 4.3.13 shows non-CEO executives' total remuneration and its components of FTSE SmallCap companies. N is the number of observations. Mean is the average value of the variable. SD stands for standard deviation. Min and Max are the minimum and maximum value of the item. P25 and P75 are the value at 25% quantile and 75% quantile respectively. The percentage at the last column is how many percent of total remuneration is awarded in that type of remuneration. All the values are unconditional Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	11708	129,829	75,492	0	82,000	122,000	170,000	933,712	36.15%
Total fees	11708	1,124	21,335	0	0	0	0	1,029,013	0.31%
Total bonus	11708	48,935	111,688	0	0	16,000	56,390	4,000,000	13.63%
Total equity	11708	147,199	2,593,178	0	0	0	41,555	209,000,000	40.99%
Total misc	11708	8,827	65,709	0	0	0	0	2,192,000	2.46%
Others	11708	23,235	92,452	0	3,942	10,000	16,000	3,087,696	6.47%
Overall total	11708	359,149	2,605,364	0	121,000	192,000	323,100	209,000,000	100%

Table D9. FTSE SmallCap non-executives' remuneration

Table 4.3.14 shows non-executives' total remuneration and its components of FTSE SmallCap companies. N is the number of observations. Mean is the average value of the variable. SD stands for standard deviation. Min and Max are the minimum and maximum value of the item. P25 and P75 are the value at 25% quantile and 75% quantile respectively. The percentage at the last column is how many percent of total remuneration is awarded in that type of remuneration. All the values are unconditional. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	20878	1,104	20,524	0	0	0	0	2,193,000	3.89%
Total fees	20878	23,451	27,939	0	10,672	18,371	28,000	1,685,000	82.60%
Total bonus	20878	428	9,799	0	0	0	0	673,120	1.51%
Total equity	20878	1,970	99,145	0	0	0	0	13,000,000	6.94%
Total misc	20878	192	7,180	0	0	0	0	606,000	0.67%
Others	20878	1,248	21,027	0	0	0	0	1,818,000	4.39%
Overall total	20878	28,392	111,078	0	11,000	19,679	29,350	13,000,000	100%

Table D.10 FTSE Fledgling CEO remuneration

Table 4.3.15 shows CEO total remuneration and its components of FTSE Fledgling companies. N is the number of observations (firm-years). Mean stands for the average value; SD is the standard deviation. P25 and P75 are the value at the first and third quartile, respectively. Percent captures the percentage of the total remuneration that is awarded via this type of remuneration. The values in bold are unconditional statistics, which takes into account all variables with a zero value. The other values are conditional statistics based on non-zero values only. N (the number of observations) always equals to maximum number of observations possible for the unconditional statistics. The N for the conditional statistics is the number of firm years when a certain type of remuneration is actually given. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	2705	108,556	98,259	0	0	114,000	174,000	757,000	46.20%
Salary cash	374	192,136	89,549	2,000	142,000	186,119	235,000	757,000	
Salary shares	1	22,000		22,000	22,000	22,000	22,000	22,000	
Total fees	2705	4,358	12,818	0	0	0	0	250,000	1.85%
Fees cash	170	24,731	26,439	3,750	17,000	20,000	23,500	216,666	
Fees shares	0								
Total bonus	2705	27,371	68,414	0	0	0	27,000	1,100,000	11.65%
Bonus cash	964	75,034	94,450	1,000	24,188	48,076	90,500	1,100,000	
Bonus shares	4	87,000	84,735	40,000	43,000	47,000	131,000	214,000	
Bonus vdf	1	105,000		105,000	105,000	105,000	105,000	105,000	
Bonus mdf	5	213,957	215,192	20,787	35,500	122,500	430,000	461,000	
Total equity	2705	76,496	932,563	0	0	0	0	42,900,000	32.56%
Restricted share	184	442,470	1,235,139	1,688	77,589	178,867	311,250	11,000,000	
Stock option	352	351,308	2,376,255	0	29,957	78,935	178,590	42,900,000	
Total misc	2705	3,182	45,715	0	0	0	0	2,000,000	1.35%
Transaction Bonus	2	1,012,507	1,396,526	25,014	25,014	1,012,507	2,000,000	2,000,000	
Deferred Cash Bonus	5	56,124	19,394	27,618	45,000	64,000	71,000	73,000	
Loss of Office	24	214,398	97,523	50,000	156,500	198,000	255,000	438,000	
Recruitment Incentive	4	129,491	47,365	85,000	98,482	118,482	160,500	196,000	
Reallocation expenses	4	159,501	229,187	14,002	24,501	62,000	294,500	500,000	
Others	2705	14,990	94,346	0	0	6,000	14,818	4,248,000	6.38%
Overall total	2705	234,954	963,678	0	18,750	145,000	255,434	43,300,000	100.00%

Table D.11 FTSE Fledgling Executive remuneration (excluding the CEO)

Table 4.3.16 shows non-CEO executives' total remuneration and its components of FTSE Fledgling companies. N is the number of observations. Mean is the average value of the variable. SD stands for standard deviation. Min and Max are the minimum and maximum value of the item. P25 and P75 are the value at 25% quantile and 75% quantile respectively. The percentage at the last column is how many percent of total remuneration is awarded in that type of remuneration. All the values are unconditional. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	5835	95,226	63,539	0	56,250	90,000	126,000	702,419	49.44%
Total fees	5835	609	6,917	0	0	0	0	196,000	0.32%
Total bonus	5835	17,208	46,960	0	0	0	20,000	1,037,080	8.93%
Total equity	5835	57,054	611,070	0	0	0	0	28,600,000	29.62%
Total misc	5835	7,565	49,437	0	0	0	0	1,247,000	3.93%
Others	5835	14,950	48,162	0	1,987	8,000	13,000	1,424,110	7.76%
Overall total	5835	192,612	627,990	0	77,000	123,000	194,000	28,800,000	100%

Table D12. FTSE Fledgling non-executives' remuneration

Table 4.3.17 shows non-executives' total remuneration and its components of FTSE Fledgling companies. N is the number of observations. Mean is the average value of the variable. SD stands for standard deviation. Min and Max are the minimum and maximum value of the item. P25 and P75 are the value at 25% quantile and 75% quantile respectively. The percentage at the last column is how many percent of total remuneration is awarded in that type of remuneration. All the values are unconditional. Data source: Own calculations based on data from Manifest and Datastream.

Variable	N	Mean	SD	Min	P25	Median	P75	Max	Percent
Total salary	10336	1,036	12,605	0	0	0	0	450,000	3.75%
Total fees	10336	20,926	291,453	0	8,254	15,000	22,500	29,600,000	75.87%
Total bonus	10336	320	6,436	0	0	0	0	264,000	1.16%
Total equity	10336	4,333	163,894	0	0	0	0	13,000,000	15.71%
Total misc	10336	190	7,790	0	0	0	0	606,000	0.69%
Others	10336	776	8,011	0	0	0	0	358,000	2.81%
Overall total	10336	27,581	337,079	0	9,000	15,000	24,000	29,800,000	100%

ⁱ In our regression analysis, we assume the error terms to be independent across firms, but not necessarily so across time. We have adjusted all the standard errors for clustering (StataCorp, 2001), which guarantees the validity of our result from regressions with panel data techniques. We also use the type-2 Tobit model (Heckman, 1979) to make sure the estimates are consistent.