ecgi

Director Networks and Takeovers

Luc Renneboog
CentER, Tilburg University and ECGI

Yang Zhao
Cardiff Business School, Cardiff University

This paper can be downloaded without charge from:
http://ssrn.com/abstract_id=2327620

www.ecgi.org/wp

ECGI Working Paper Series in Finance

Director Networks and Takeovers

Luc Renneboog
Yang Zhao

Abstract

We study the impact of corporate networks on the takeover process. We find that better connected companies are more active bidders. When a bidder and a target have one or more directors in common, the probability that the takeover transaction will be successfully completed augments, and the duration of the negotiations is shorter. Connected targets more frequently accept offers that involve equity. Directors of the target firm (who are not interlocked) have a better chance to be invited to the board of the combined firm in connected M&As. While connections have a clear impact on the takeover strategy and process, we do not find evidence that the market acknowledges connections between bidders and targets as the announcement returns are not statistically different from those bidders and targets which are ex ante not connected.

Luc Renneboog*
Professor of Corporate Finance
Tilburg School of Economics and Management, Department of Finance
PO Box 90153
Tilburg, Netherlands
phone: +31 13 4668210 , fax: +31 13 4662875
e-mail: luc.renneboog@tilburguniversity.edu

Yang Zhao
Lecturer in Finance
Cardiff University, Cardiff Business School
R34, Aberconway Building
Cardiff, Wales
phone: +44 29 20876434
e-mail: zhaoy29@cardiff.ac.uk

*Corresponding Author

Director Networks and Takeovers

Luc Renneboog [1]

CentER, Tilburg University

and

Yang Zhao [2]

Cardiff Business School, Cardiff University

Abstract

We study the impact of corporate networks on the takeover process. We find that better connected companies are more active bidders. When a bidder and a target have one or more directors in common, the probability that the takeover transaction will be successfully completed augments, and the duration of the negotiations is shorter. Connected targets more frequently accept offers that involve equity. Directors of the target firm (who are not interlocked) have a better chance to be invited to the board of the combined firm in connected M&As. While connections have a clear impact on the takeover strategy and process, we do not find evidence that the market acknowledges connections between bidders and targets as the announcement returns are not statistically different from those bidders and targets which are ex ante not connected.

[1] Department of Finance and CentER, Tilburg University, P.O. Box 90153, 5000 LE Tilburg, the Netherlands, and European Corporate Governance Institute (ECGI), email: Luc.Renneboog@uvt.nl, phone: +31 13 4668210, fax: +31 13 466 2875.

[2] Cardiff Business School, Aberconway Building, Colum Drive, Cardiff CF10 3EU, the UK, email: zhaoy29@cardiff.ac.uk, Tel: + 44 (0)29 2087 6434, fax: + 44 (0)29 2087 4419,

Director Networks and Takeovers

1. Introduction

Traditionally, firms have invited top managers of other corporations or bankers to serve on their boards of directors. Despite some restrictions in the UK Corporate Governance Code[3], interlocking directorships are still common in listed UK companies. The fact that executive directors also occupy board positions in firms other than their own can create useful connections not just at the personal (director) level but can also be valuable for firms. Through such networks, directors develop and strengthen their personal (and social) ties, which may lead to more influence in board room discussions. Furthermore, networks enable directors to gather information about corporate strategies, sector trends, (macro-)economic evolutions, but also about the evolution in executive remuneration, and managerial vacancies in other companies.

Over the last decade, director networks have attracted growing academic attention in the field of corporate finance and corporate governance. With the help of the network method based on graph theory, studies have documented a positive link between networks and firm performance (Geletkanycz and Boyd, 2011; Larcker, So and Wang, 2013). The main argument is that networks provide better access to information from which the firm can benefit in decision making (Omer, Shelley and Tice, 2012). More recently, researchers have revealed previously hidden relationships between the connections of the corporate elite and

---

[3] The Higgs report (2003) suggested that a full-time executive director of a listed company should not hold more than one non-executive directorship and should not be Chairman of another listed company. Furthermore, no one should be (non-executive) Chairman of two major (FTSE 100) companies. Within a company, a CEO should not also hold the position of chairman. The report does not limit the number of non-executive directorship that one can hold (in unlisted firms). At the end of 2003, the Higgs report was incorporated in the UK Corporate Governance Code (formerly known as the Combined Code). It should be noted that firms adopt this code voluntarily, which stands in contrast to the corporate governance developments in the US where the Sarbanes-Oxley Act can lead to legal intervention in case of violations against the Act.

board room issues such as decision making on managerial compensation, hiring and firing of top management, the recruiting of non-executive directors, and corporate restructuring. For instance, Liu (2013) shows that a CEO's connections (here labelled as 'outside options') enhance his opportunities to leave his firm for another challenge. Cai and Sevilir (2010) demonstrate in the context of mergers and acquisitions (M&As) that informational asymmetries are lower when the bidder and the target have a common director. Renneboog and Zhang (2011) and Horton, Millo and Serafeim (2012) demonstrate that a CEO's direct and indirect connections affect his power and his information-collection value, which is reflected in a higher remuneration.

In this paper, we focus on how the connections of bidder and target firms impact on various aspects of mergers and acquisitions (M&As) in the UK. In a network context, we study the frequency of takeovers, the M&A process (in particular, the duration of the negotiation and the success versus failure at the end of the negotiation process), the means of payment (all-equity, all-cash or mixed offers), the retention or attraction of directors of the target firm on the board of the merged firm, and whether there is a differences in terms of expected returns at the announcement of connected and non-connected M&As.

To analyze the existence of director networks between bidder and target, we resort to simulations of matching (potential) targets and bidders among all UK listed companies. To find out the determinants of the various aspects of the takeover process mentioned above, we use (multi-)nominal probit and tobit models, and as a robustness check sample selection models. We find that when two firms are directly connected via their directors, the probability that they merge or that one firm takes over the other is significantly higher than when the firms are not connected. Takeover activity is not only affected by direct links with other firms but also by the indirect connections of the board and of the CEO of the bidding firms: if those (executive) directors hold many connections, acquisitions frequently occur. So, better connected companies are more active bidders. We demonstrate that when a bidder and a target have one or more directors in common, it is more likely that the takeover transaction will be successfully completed. In this context, only direct connections play a role (and not the

indirect proxies for information collection). Furthermore, connections also significantly reduce the time spent in the negotiation process (both for successful or failed negotiations). It is possible that connections lead to an informational advantage which may translate into more trust between the parties involved, as connected firms more frequently accept equity offers. Directors of the target firm (who are not interlocked) have a better chance to be invited on the board of the combined firm in the case of a connected M&A.

While connections seem to have a clear impact on the takeover strategy and process (frequency, duration, successful completion, means of payment, board composition of the combined firm), we do not find evidence that market acknowledges that some M&As are connected (or that it matters in terms of expected value creation) because the cumulative abnormal returns (CARs) around the announcement date are not statistically different from zero.

This paper is organized as follows. In the next section, we review the existing literature and formulate the hypotheses. In section 3, we present the descriptive statistics of the (sub)samples. The results of the empirically analyses are discussed in section 4, and section 5 comprises our conclusion.

2. Hypotheses and Methodology.

The information value of director networks consists of directors' ability to collect (non-public) information about the potential target or bidder and about the potential synergies in an M&A. Companies with better information access (through networks) are more likely to find valuable targets and therefore initiate more takeovers. If the bidder or target are directly connected through cross-directorships, these common directors may already have disclosed relevant information about the potential benefits of an M&A prior to the negotiations such that the negotiation process can be sped up. We formulate our hypotheses on the relation between the information value of connections and the value, process, and performance of M&A in this section.

2.1. M&A Frequency.

The first question we ask is whether the frequency of takeover bids initiated by a firm is related to its network; in other words, do takeovers occur more often between firms with common directors? It may be that firms who intend to take over another firm or want to be taken over, offer a directorship to an (executive) director of a potential target or bidder, respectively. This director may gain more information on the counterpart such that expensive takeover mistakes can be avoided. The relation between takeover decisions and individual director or corporate networks is not necessarily only based on direct links between bidder and target as indirect director connections (links not directly with the respectively bidder or target but through third boards) may also facilitate information transmission across companies. Indeed, better connected companies are more likely to find suitable targets and engage more frequently in M&As. Only few studies (Ishii and Xuan, 2010, and Wu, 2011) have related the takeover probability to corporate (director) relations. Both studies focus on the US and show that firm connectedness in an M&A sample is much higher than in random samples. We also start our analysis with the method inspired by Ishii and Xuan (2010) and use simulation techniques to create different samples from which hypothetical pairs of acquirers and targets are selected. We expect that the level of connectedness is higher in the takeover sample group than in the simulated samples, which leads to the following hypothesis: *An M&A is more likely to occur between two firms which are directly connected by means of common directors (Hypothesis 1a) and for firms with a high indirect centrality scores which proxy for the information collection ability of their directors in the universe of (listed) firms (Hypothesis 1b).* This is translated into the following model:

(Cumulative) number of M&As = α+β₁ (direct or indirect) centrality measure + β₂* firm characteristics + ε, w*hereby the centrality measure can be one of the following variables: the bidder's Degree, normalized Closeness measure, its Eigenvector centrality, and its (normalized) Betweenness.[4]

2.2 Duration and Completion of M&A negotiations.

When the intention of the acquisition of a potential target is disclosed to the market by the

---

[4] For the definitions of Degree and Closeness: see the methodology section. For the definition and calculation of other centrality measures (eigenvalue (a direct centrally measure) and betweenness (an indirect centrality measure)) which we use as a robustness check, see Renneboog and Zhao (2011).

bidder or the target, the target board needs to decide how to react and what advice (rejection or acceptance) to give to its shareholders. Upon a negative response by the target board, the bidder may make a sweetened offer or initiate a hostile takeover. As a reply, the target company may consider accepting an upwardly revised offer or ask permission to the shareholders on an extraordinary general meeting to activate various defensive mechanisms to protect itself (Goergen et al., 2005; Martynova and Renneboog, 2008b, 2011b). The duration of the M&A process (from announcement to deal completion) can be measured. The bidder usually prefers to have a short negotiation duration, as a longer waiting time due to the target's resistance increases the transaction costs and uncertainty. Moreover, connections between bidder and target may also have an impact on the negotiation duration in case of unsuccessful M&As; connections also resolve the information asymmetry problem and enable the parties involved to reach the end of negotiation (in this case: the bidder withdraws) within a shorter period of time. In sum, we expect that director connections shorten the negotiation time, thanks to the directors' information about the counter party or the indirect information value of their network. We also expect networks to have an impact on the completion rate of the negotiation process. The completion rate stands for the frequency of successfully rounding off the M&A process with a signature that the two firms will be merged. *M&As of firms involving direct connections or bidders with strong information gathering potential (high indirect centrality) successfully reach the end the M&A process more frequently (Hypothesis 2a). M&As of firms with direct connections and firms with strong information gathering potential (high indirect centrality) experience a shorter takeover duration process as well (Hypothesis 2b).*

The duration of the M&A negotiation period is counted as the number of days starting from the day on which an M&A intention is first publicly disclosed, until the transaction is completed (the contract is signed) or the negotiation is abandoned. In some cases, we cannot determine the negotiation time as the first public announcement that takeover negotiations have taken place only occurs upon completion of the deal. We treat these observations separately in our study.

2.3. Payment Method.

An important aspect of the negotiation relates to the payment method. An M&A could be concluded in cash, in equity, or in a mixture of both. Information asymmetries between bidder and target are an important determinant of the means of payment in corporate acquisitions (Renneboog and Martynova, 2009). In particular, uncertainty about the true value of the target firm induces the bidder to pay with its own equity rather than cash. Capital participation in the combined firm makes the target shareholders share the risk of potential downward revaluations after the bid's completion. Faccio and Masulis (2005) document that a change in the corporate control structure – for instance, by means of voting power dilution or the emergence of an outside blockholder - may discourage bidders from paying for the acquisition with equity. Thus, the likelihood of an equity payment is determined by the control structures of the bidding and target firms. In particular, a cash payment is strictly preferred to an equity payment when the target's share ownership is concentrated and a bidder's largest blockholder only holds an intermediate or low level of voting power. This preference is weakened if the target company is widely held or if the bidder's dominant shareholder has a supermajority of voting rights.

From a target shareholders' perspective, the difficulty related to an all-equity offer lies within the uncertainty about bidder's stock value. An equity offer can be interpreted by the target as a signal that the stock of the bidder is overvalued. This offer could therefore extend the negotiation process as more detailed information on the bidder is to be gathered. If there are common directors between bidder and target, we expect that the target is able to assess the bidder's stock value more accurately –overvalued or not - and will be more willing to accept an equity offer (at the right offer rate). There are many studies on the payment method, but none, save Wu (2011), mention the effect of director networks. Wu (2011) finds that connections between bidder and target increase the likelihood of using a stock payment by 18.5%. Similarly, we hypothesize that: *In M&As with direct connections between acquirer and target, offers involving equity occur more frequently (Hypothesis 3).*

2.4. M&A Performance.

A key issue in this paper is that direct and indirect connections at the firm level (and the

individual director level) create an informational advantage which implies that the acquirer is able to select better acquisitions, which is in turn reflected in the creation of more value. The question is therefore whether the market recognizes that the bidder makes a connected acquisition. If the market is aware of this type of M&A and is convinced that the bidder is hence unlikely to waste resources through an unsuccessful takeover, the bidder's abnormal stock return will be significantly positive upon the announcement of such an acquisition. In contrast to the abnormal announcement returns of the target which typically are in the range 25%-35%, we know that the bidder's announcement returns are in general very close to zero, either slightly negative or slightly positive but on average not statistically different from zero. A comprehensive overview of long and short term M&A returns for bidders and targets around the world since the early 20th century can be found in Martynova and Renneboog (2008a). If the bidder has a well-connected board and is hence better informed, the bidder's CEO may be less likely to succumb to building empires through M&As at the expense of value creation. Evidence supporting this hypothesis has been documented for the US by Cai and Sevilir (2010). Keeping in mind the benchmark of zero CARs for the bidder around the announcement data, we hypothesize: *In M&As with direct or indirect connections between acquirer and target, the acquirer's CARs are significantly positive (Hypothesis 4).*

The alternative hypothesis is that connected M&As destroy value (in expectation) because a connection may induce a false trust in the target. If connections are regarded as substitutes for active information collection on the target such that the bidder's estimation of the compatibility between the bidder and the target and of the potential synergy value becomes blurred, then connections induce poor takeover decisions. Furthermore, social connections (e.g. decision makers in the bidder and target are friends) may contribute to the overvaluation of the target. Therefore, acquiring a connected target may be considered as not efficient by the investors such that a negative correlation between connections and announcement returns is expected, which has been shown by Ishii and Xuan (2010) and Wu (2011) for US acquisitions. Both studies show that connected M&As have lower bidder announcement returns than unrelated M&As.

2.5. The Bidder's CEO Compensation.

Renneboog and Zhao (2011) find a close relation between a CEO's network and his remuneration. They distinguish between different types of centrality variables and state that direct measures represent managerial power or influence whereas the indirect centrality measures capture the degree to which a CEO is able to gather valuable information. Both types of networks are related to higher remuneration (higher bonus and higher equity-based compensation), but they conclude that the direct network contributes most to excessive CEO pay. In the context of this paper, an acquiring company may have contractually committed to pay the CEO a bonus if he is able to complete successfully an acquisition. This creates strong incentives for a CEO to acquire other firms. The question is here whether a CEO is using his own connections and those of his firm to facilitate takeovers in order to get an acquisition bonus subsequent to the acquisition. According to Grinstein and Hribar (2004), managerial power is the primary driver of CEO bonuses following M&As. It should be noted that the vast compensation literature doubts the independence of the CEO in the design of his compensation contract, which would be especially the case for powerful CEOs with a long tenure (Liu, 2013). Therefore, we hypothesize that *CEOs obtain a higher bonus when they undertake M&As facilitated by connections between acquirer and target (Hypothesis 5).*

2.6. Target Director Retention

We examine whether the directors of the target company have a larger probability, subsequent to the M&A, to be on the board of the combined company. If professional connections are instrumental to bring M&As to a good end, connected directors of the target may have a higher probability to be retained on the board of the merged firm. The professional (and social) ties of the directors serving on both the bidder and target boards may lead to a higher number of not-connected target directors to be invited to board of the combined firms. Some studies document that the retention of the target CEO is positively affected by factors including the abnormal stock return of the acquirer (Matsusaka, 1993) and social connections to target company (Ishii and Xuan 2010). Hence, we expect that *the target directors with no prior connections to the bidder are more frequently invited to serve on the board of the combined firm if there are connections between the acquirer and target (Hypothesis 6).*

3. Sample Selection, Data Sources, and Descriptive Statistics.

Our M&A data are gathered from the Thomson One Banker SDC Premium database. We collected information about 743 acquisition announcements that involved bidders and targets both listed on the London Stock Exchange and took place over the period 1995 to 2012. We collected stock price, accounting information (total assets, cash ratio, debt-to-assets ratio), and other control variables (e.g. return on assets (ROA)) from Datastream as well as data on the bidders' and targets' individual board members (e.g. the number of (non-)executive directorships, cross-directorships between our M&A sample firms, ownership stakes by type of shareholder) and on their board structures from the BoardEX database.

The first two columns in Table 1 show the size of our acquisitions' sample and its distribution over time. Most takeover announcements occurred in the periods 1998 to 2000, which represents the climax of the fifth takeover wave (Martynova and Renneboog (2006, 2011a)), and 2005 to 2007 which coincides with the recovery of equity market following its prolonged slowdown triggered by the high tech collapse in 2000 (Goergen and Renneboog (2004)). Columns (3) and (4) record the number and proportion of takeovers that are connected through directors; a larger proportion of connected acquisitions occurred when the market for corporate control was booming. On average, 9.4% of all acquisitions are connected (Column (5)), a ratio is comparable to the US takeover samples in Wu (2011) and Ishii and Xuan (2011) (6.38% and 10.60%, respectively). Table 2 depicts the number of acquisitions across industries: takeovers are most frequent in the financial sector and the services industry (with respectively, 28.94% and 21.27% of all bidders). Takeovers also occur often in manufacturing and retailing sectors.

[Insert Tables 1 and 2]

The characteristics of the acquisitions such as connectedness, number of announcements per bidder, takeover success rate, negotiation time, transaction size, means of payment in the offer, and the market response to the takeover announcement are reported in Table 3. Many bidders, namely 139 out of 513, have acquired/attempted to acquire more than one target throughout

our sample period (Panel A). Amongst them, some were serial bidders acquiring up to seven target firms within our sample period. Panel B presents the target's attitude towards to the offer. In the UK market for corporate control, most M&As are friendly, only approximately 5% of the deals are hostile takeovers (which are defined as deals with target board opposition – whatever the reason). Most offers are all-cash offers (46.3%), almost a third are all-equity deals (which include the largest transactions), and about 22% of the offers comprise a mix of cash and equity (possibly also of loan notes) – see Panel C. It should be noted that our sample includes all bids, both the successful transactions (609) and failed ones (134 deals ended with the bidder withdrawing the offer). If we analyse the success rate conditional on the bidder and target being connected through their directors (Panel D), we find that connected deals have a substantially higher success rate than the unconnected ones (96% vs. 81%, the difference being statistically significant at the 99% confidence interval). Panel E shows that in 9.4% of the acquisitions, the bidder and target have at least one director in common, and on average 16.4% of all directors of the bidder and target boards serve on both boards (which implies that some firms are connected through multiple directorships – more precisely, in the average M&A transaction, the bidder and target have 1.74 directors in common). The statistics about negotiation time are reported in Panel F. For the successful deals, the average time between announcement and completion is almost two months (59.6 days)[5], and in unsuccessful deals the offer is withdrawn after a similar time period (of about 60 working days). Note that in some rare cases, it can take up to ten months to finalize the transaction. The deal size amounts to GBP 143 million, with the largest transaction amounting to GBP 1 billion (Panel G). The median deal size (the value of the offer scaled by the market value of the bidder) amounts to 0.24, which indicates that the bidder is about four times larger than the target. Two thirds of the transactions occur between two companies from the same industry, which we call focused transactions. In panel H of Table 3, we summarize how the market receives the announcement and show the CARs over event windows of different lengths ([-1,+1], [-5,+1] and [-10,+10], whereby day 0 is the announcement day). We estimate the market model over the period 194 to 41 days before the announcement to get the systematic risk. In line with earlier research, the

---

[5] This statistics is calculated after the 2% observations with longest negotiation time – which are prone to recording error - were removed from the sample.

announcement CARs [-1,1] for the bidder are indistinguishable from zero with a mean of -0.47% and a median of exactly 0%. The 25% and 75% quartiles span a range of -2.36% to 1.34%. In the final Panel (I) we present statistics for the number of target directors joining combined firm after the deal. On average, one director from the target company will remain on the board of the combined company. Note this number does not include the ex-ante common directors between bidder and target. Apparently, more target directors are invited to serve on the board of the combined company if bidder and target had been connected prior to the M&A.

[Insert Tables 3 and 4]

Table 4 exhibits the bidders' characteristics. Degree and Closeness are used to measure the bidder's network centrality, but they capture different network properties. In order to differentiate and compare the network advantage of the CEO and the entire company, we calculate centrality measures on different levels. More specifically, Degree (C) measures the number of director interlocks held by a company (hence the C-label); Degree (D) measures the number of interlocks at the individual director level (hence the D-label) and we concentrate on the network of the CEO in this study. Closeness (C) evaluates how close a company is to all other companies in the network, while Closeness (D) takes the individual director as a node. In order to define Closeness, we first create a matrix for all the companies (directors) whereby each cell represents a connection between the companies (directors) or lack thereof. A cell comprises a one in case of a connection and a zero in case of no connection. We define the farness of a vertex as the sum of geodesic distances between this vertex and all other vertices that can be reached. We transform the matrix into the geodesic distance matrix by replacing all the zeros by the geodesic distance. A higher farness value indicates that the vertex is further from other vertices. In order to define Closeness (and normalized Closeness), we calculate the inverse of the sum of all geodesic paths from vertex 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 one divided by the sum of the lengths of geodesic paths (d_G) from v to any other vertex t. A high Closeness value reflects the shorter distance to all other vertices, which suggests that the target vertex is more central in the network. The normalized Closeness is defined by the

following formula where n is the number of vertices in the graph: $C'_c(v) = \dfrac{100(n-1)}{\sum d_G(v,t)}$. A higher

normalized Closeness score implies a shorter distance to other vertices, in which case companies (directors) may be able to acquire the information faster. 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). Degree proxies for a firm's (a director's) direct ability to collect information about the target and the bidder, whereas Closeness is an indirect measure that shows how close a corporate (or director) node is to other nodes in the whole network of corporations (directors). Therefore, closeness focuses on the general information collection ability in the entire network, rather than access to information from interlocked companies. The reason to differentiate the two is that according to social network theory, information from close-by nodes are stronger but more likely to be redundant than that from distant nodes. On average, the bidders in our sample have (executive and non-executive) directors who hold directorships in six other companies, which is higher than the average Degree (4) of all listed UK companies reported in Renneboog and Zhao (2011). Table 4 also reports the normalized Closeness at the company level (C), and Degree and normalized Closeness at the director level (D). In this paper, we focus on the connectedness of the CEO rather than other directors. Therefore the centrality measures at the director level (D) are based on the CEO in that financial year. The Degree measure at the director's level is higher than at the corporate level as is comprises the links with the directors of all the boards that directors is serving on. The average bidder's board size is 10.5 with a median of 10. The last four rows of Table 4 contain bidders' statistics on the ROA, cash ratio, debt ratio, and total assets (in million GBP).

4. Results.

4.1 The Frequency of Connected M&As.

If it is true that director networks increase the probability of M&As (Hypothesis 1), we expect to find more connections between companies in the M&A sample than between randomly matched companies. We therefore compare the level of connectedness of the M&A sample – the pairs of bidders and targets in our original sample - to that of three other simulation groups

drawn from the universe of all listed UK firms. From the descriptive statistics, we know that the probability of having at least one common director between a bidder and a target is 9.42%. In the first simulation group, we match a bidding company in the sample to a potential target company randomly selected from the industry of the real target in the year of the acquisition. For instance, in 2007, company A acquired company B in the chemical industry. In the simulation, we match company A to another randomly selected company C from the chemical industry. By checking the board information of company A and the pseudo-target C in the year 2007, we examine whether A and C have directors in common. This procedure is repeated for all other bidders in the sample. When the pseudo-target happens to be the same company (C = B) as the real target, we replace it with another company D until D ≠ B. The second simulation group includes the targets from our sample matched with randomly selected potential bidding companies from the industry of the real bidder in the year of acquisition. The third simulation group includes random bidders and random targets selected from the industry of the firms involved in the real M&As in the year of the M&A.

In simulation group 1 (Table 5), the percentage of directly connected companies is 4.38%; this is significantly lower than the real percentage of connected firms in our M&A sample (9.42%). When we match randomly selected 'bidders' (from the same industry as the bidder) to the real M&A targets, we do not find any common directors between those bidders and targets. Finally, less than 3% pseudo-bidders and pseudo-targets (both are randomly drawn from the same industries as the bidder and the target) are connected. We conclude that the average level of connectedness is much higher between the real M&A companies than randomly paired companies, which supports our first hypothesis that connections matter in M&As. Our simulation results are in line with the results from US data presented in Ishii and Xuan (2010).

[Insert Table 5 about here]

We further examine the relationship between M&A activity and the level of connectedness. First, we regress the total number of M&As that a bidder undertakes on the network centrality of the bidder and other control variables (including board size, corporate performance, and the financial structure). The independent variables are the average values for the whole sample

period. The result is reported in Panel A of Table 6: the Degree centrality measure at company level (Average Degree (C)) is positively correlated with the number of M&As. This implies that companies with many interlocking directors more frequently enter into M&A activity. The (normalized) Closeness and the other centrality measures at the director (CEO) level, have a positive but insignificant impact on the number of M&As. With exception of the debt-to-equity ratio of the bidder, other factors including profitability, board size and structure, and ownership structure (now shown) do not affect the cumulative number of M&As. In panel B of Table 6, we take as dependent variable the cumulative number of deals over time, which is the number of M&As that a bidder initiated since the start of our sample period up to a specific point in time. The cumulative number-approach considers the M&A activities every year while also taking into account the history of M&A activities and thus combines these two measures: a dummy variable capturing an M&A transaction announcement in one particular year and the total number of acquisitions that a bidder has undertaken over the whole time period. We find that all centrality measures significantly increase the occurrence of an M&A. This signifies that the when a bidder and its CEO have many connections (a high Degree), the takeover activity of this bidder significantly augments. The same is valid when the firm is strongly connected to the population of listed firms as expressed by its high Closeness.

Nevertheless, the above analysis cannot rule out one alternative argument that firms planning expansions via acquisitions appoint well-connected directors to overcome information asymmetries. In other words, instead of connectedness influencing M&A probability, it may be other way around. If that is indeed the case, we expect to find that well-connected directors (especially the ones connected with the target) are appointed shortly before the M&A occurs. However, in the sample, the average tenures of the connected directors in the target firm is more than 2.6 years. For most of sample (75%), the common director has been on the target board for more than one year when the M&A is announced. On the bidder side, the common director's average tenure is 3.5 years. Therefore it is less likely that establishing connections is solely driven by the purpose of an M&A.

To sum up, the analyses shown in Tables 5 and 6 yield strong evidence supporting the hypotheses 1a and 1b. Namely, we find a positive relationship between takeover frequency

and connections through directorships between bidder and acquirer. Furthermore, not only direct connections between bidder and target are important, but so are the indirect connections of the board and the CEO of the bidding firms. In general, better connected companies are more active in M&As.

[Insert Table 6 about here]

4.2 M&A Completion Rate.

Better connected companies are more likely to engage in M&As. However, are these bidding firms also more successful in completing the M&A negotiations (with a signature confirming the creation of a combined firm)? In Table 7, we present the results of 6 logit models which relate the takeover completion rate to difference measures of connectedness. We demonstrate that when a bidder and a target have one (model (1)) or more (model (2)) directors in common, the probability that the takeover transaction will be successfully completed significantly augments. Models (3) and (5) show that bidders with a high Degree (bidders are connected to many firms) are also more successful to bring the M&A negotiations to a successful end. It should be noted that only the direct connections have an impact on the completion of the M&A process which supports Hypothesis 2a. This is not the case for the indirect connections which are captured by the normalized Closeness at the bidder and the bidder-CEO level (models (4) and (6)). As predicted, hostile takeover negotiations have a higher chance to fail and making a cash offer improves the odds to complete the transaction.

[Insert Table 7 about here]

4.3 Duration of M&A negotiation.

While the previous section has shown that connectedness increases the probability to successfully complete the deal, we now analyze whether the M&A negotiation time is influenced by director connections. We expect that the time between the first public M&A announcement and the completion of the negotiations (whether they are successful or not) are shorter when the bidder and target share directors. Connections of this sort can improve the information exchange such that less time is needed to complete the negotiations. As the

15

negotiation time is a left censored at zero for 18% of the sample, Tobit models are used in Table 8. Panel A exhibits that both connection variables (the dummy capturing whether the target and bidder are connected and the number of connections between bidder and target) are significantly negatively related to the negotiation time. This implies that a connection between bidder and target significantly reduces the time used to negotiate the deal. This can result from the fact that bidder and target have already acquired much information prior to the first public announcement of the bid and/or that the connections stimulate the trust in the counterparty. This result is valid both for the subsample of successful M&A deals as well as for the full sample including the deals with failed negotiations. Consequently, Table 8 provides strong support for Hypothesis 2b. In line with our expectations, Panel A also shows that hostile takeovers trigger more resistance in the sample of ultimately successful deals. When the offer includes equity, the valuation of the bidder's equity may become an important issue in the negotiation such that more negotiation time is required. We also show that larger firms spend more time negotiating.

In Panel B of Table 8, we add bidder centrality at the company level to the models of Panel A. A higher centrality measure, Degree (C), implies that many directors take directorships outside the bidding company. In the context of the negotiation process with a target, we find that a higher Degree prolongs the negotiation time. This suggests that a board with people who hold many outside directorships may negatively affect the efficiency of decision making due to lack of monitoring by this 'busy board', and may reduce the focus on (and increase the duration of) the negotiations with the target firm. The Closeness (at the company level) captures how close a firm is to important nodes in the network and is hence proxy for information collection ability within the population of listed UK firms. A high Closeness could imply that the bidding firm is better informed about the takeover opportunities in the market which hence reduces the negotiation time. The statistical significance of Degree and Closeness does not influence the significance of the Connected dummy variable and the Number of connections.[6]

---

[6] We also tested the effect of centrality measures on the individual level, but they do not have a significant influence on negotiation time.

As a robustness test, we take the models of Panel A and substitute the variables capturing the direct connection between bidder and target by – one at the time : (i) Degree at the company level (C), (ii) Degree at the director (CEO) level (D), (iii) Closeness at the company level (C), and (iv) Closeness at the director (CEO) level (D). We find that the statistical significance which we have found for these variables in Panel B does not change. Another robustness check is survival analysis using hazard models on the sub-sample of non-zero negotiation time observations. The result implies that connections shorten negotiation time (although insignificantly so). Moreover, deals with more cash in payment and smaller bidder company size on average take less time to complete.

[Insert Table 8 about here]

4.4. The Means of Payment.

From an information value perspective, director networks that span the bidder and target provide better information access, which may enable the target to evaluate the synergy value as well the bidder's equity value more accurately. We therefore expect that such connections induce trust and that in connected M&A equity is more frequently used as payment. The results of Models (1) in Panel A of Table 9 reveal that connections do indeed have a significant and positive impact on the use of equity in an M&A offer, which supports Hypothesis 3. Models (2), where the dependent variable is an indicator variable that equals one if the offer consist of cash or is a mixed of cash and equity confirms that connections reduce the use of cash in an M&A offer. Expectedly, an equity payment is more likely when the relative transaction value is large and the bidder is smaller and less profitable as it is then more difficult to raise the bid value in cash. In Panel B of Table 9, we use the percentage of cash in the offer as the dependent variable. As before, we note that connections reduce the need to offer cash. We also include the centrality measures Degree and Closeness, but they are statistically insignificant. When we re-estimate the models of Table 9 using a multinomial regression, we find results consistent with those reported above (not shown). Lastly, as the final payment method may be influenced by the negotiation process, we apply a Heckman the sample selection model to condition on negotiation failure, and the results remain valid. To

sum up, the empirical results on the offered payment method support the hypothesis that equity is more likely to be used when bidder and target are connected.

[Insert Table 9 about here]

4.5. M&A performance.

We study the bidder's announcement CARs over a three-day event window [-1,1] (starting one day before the first public announcement of the M&A (day zero) until one day after the event) in order to examine whether connected M&As are expected to perform differently than non-connected ones. We find that the bidders' CARs of connected and non-connected M&As are not statically different. In the regression models, both the variable Connection between bidder and target (a dummy variable) and the total number of connections between them are insignificantly related to the CAR, which implies that the market does not take connections into account when they evaluate the M&A transaction (not shown). We also cannot find a relation between connectedness measured by Degree and Closeness and the CARs. As reported in the vast M&A literature on the means of payment (see Martynova and Renneboog, 2008, for an overview), we also find that an all cash payment is associated with more positive market reactions. And a larger relative deal value and a larger bidder firm size also improve the shareholders' expected valuation of the deal (at the announcement). We conclude that we reject Hypothesis 4; the market does not acknowledge the impact of connections on the M&A process and valuation. An alternative explanation could be that even though connections may be acknowledged by the market, their benefit does not outweigh their costs which are reflected in insignificant expected returns.

4.6. The Bidder's CEO Compensation.

We also investigate whether or not CEOs receive a higher remuneration after completing connected M&As, while we control for corporate performance, CEO characteristics (tenure, internal/externally hired, CEO-chairman duality), corporate governance variables (e.g. ownership concentration, board structure), and financial information. We find that director connections between bidder and target or the CEO's Degree and Closeness are not a significant determinant of his bonus, whereas to firm performance (ROA), CEO experience

(tenure), and firm size (total assets) do explain that type of remuneration. Hence, in this sample of UK bidders, we do not find convincing evidence for a relationship between CEO bonus and bidder-target connections and thus reject Hypothesis 5.

4.7. Retention of Targets' Directors.

To examine the target's director retention, we record the number of target directors who are invited as directors on the board of the merged firm and regress this dependent variable on variables capturing the connectedness of bidder and target. In order to avoid the identification error that interlocked directors are already a director on the bidder's board (and thus on the combined firm's board), we only count the number of retained directors that are not already on the bidder's board prior to the acquisition announcement. I.e., a director is only identified as a retained director if he joined the company after the deal's completion. When focus on Total Retention (model (1) of Table 10), we notice that the coefficients of both our connection variables are significant and positive. This implies that the target directors (without prior connections to the bidding firm) have a better chance to remain on the board of the combined firm when bidder and target are connected by means of shared directors. Moreover, director retention is more likely when the M&A is not hostile, the bidder and target are in the same industry and when the bidder is larger and acquires the target with an offer involving equity. In addition, a larger bidding firm size, a higher cash ratio and a lower debt ratio are also positively related to director retention. The above results support hypothesis 6 and are in line with results in Ishii and Xuan (2010). However, one potential problem is that the number of target director retention may be affected by the size of the bidder's board. Larger boards may be more likely to have extra positions for new directors than small and focused boards. In order to remove the board size effect, we replace the dependent variable by the number of target director retention scaled by the size of bidder board. The result in models (2) of Table 10 reveals that the connections-related variables are still positive and that the number of connections is significant at the 5% level.[7] As a robustness check, we use Heckman sample selection models whereby the selection regression is the success versus failure of the M&A, and we obtain similar results for the regression equation results. Lastly, Degree and Closeness

---

[7] Since board size is missing for some company years, the sample size of model (2) is smaller.

on the company as well as the bidder's CEO level are not significant when included in the above models. In other words, contrary to the direct connections between bidder and target, the general network position of the bidder or his CEO does not seem to affect target director retention.

[Insert Table 10 about here]

5. Conclusion.

In recent years, some scholars have applied graph theoretical methods in the research on the impact of director networks on managerial decision making. They found relations between networks and remuneration contracting, the managerial labour market (hiring and firing of top management, attracting non-executive directors), corporate restructuring, and firm and fund performance. In this paper, we examine the effect of the connections between the acquirer and target firms on the takeover process, more specifically on M&A frequency, the M&A negotiation success and duration, the means of payment in the offer, the M&A expected performance (as reflected in the short term wealth effects of the bidder), the bidder's CEO compensation subsequent to the M&A, and target director retention rate in the merged company. The idea is that direct connections enable both parties to gather information more easily on the counter party which establishes trust, and that the overall network (which includes the indirect connections) enable firms to scout for suitable takeover targets and collect relevant information on the whole takeover market. We find that director networks play an important role in UK takeovers in the following way: First, we exhibit strong evidence on the fact that connections through directorships between bidder and acquirer lead to more takeover activity. Not only direct connections between bidder and target are important, but so are the indirect connections of the board and the CEO of the bidding firms. In a nutshell: better connected companies are more active bidders. Second, the above conclusion raises the question as to whether connected bidders just make more acquisition attempts or are more successful in completing the M&A negotiations. We demonstrate that when a bidder and a target have one or more directors in common, the probability that the takeover transaction will be successfully completed significantly augments. Only direct connections have an impact on

the M&A process but not the proxies for indirect connections of information collection. Third, connections also significantly reduce the time used in the negotiation process (both for successful or failed negotiations). Fourth, we expect that connections yield an informational advantage which could also build trust between the parties which would in turn be reflected in the more frequent use of offers that involved equity. We confirm that equity is indeed used more often when bidder and target are connected. Fifth, the market reaction to the M&A announcement of the bidder is not related to connected takeovers. This suggests that the market either does not pick up that the two parties involved are connected or that they do not believe it to be important. Sixth, while earlier research found a positive relation between a CEO's level of connectedness and his remuneration, we do not find evidence that CEOs of connected bidders are paid more subsequent to completing a connected M&A. Finally, the target directors (without prior connections to the bidding firm) have a better chance to be invited to the board of the combined firm when bidder and target were directly connected.

The paper has contributed to our understanding of M&As and director networks. At first sight, interlocked directors and directors' information collection ability (proxied by centrality measures) makes the M&A process more efficient: the degree of connectedness increases the number of M&A transactions, increases the successful completion rate, reduces the negotiation time, and enables the bidder to offer equity. Still, it seems that the market does not recognize the fact that the parties involved are connected or attaches little value to it as the announcement share price reactions in connected M&As are small and not difference from those of unconnected M&As.

References

Cai, Ye, and M. Sevilir, 2010. Board Connections and M&A Transactions. Working Paper, UNC Chapel Hill.

Faccio, M., and R. W. Masulis, 2005, The Choice of Payment Method in European Mergers and Acquisitions, *Journal of Finance* 60 (3), 1345-1388.

Geletkanycz, M. and B. Boyd, 2011, CEO outside directorships and firm performance: a reconciliation of agency and embeddedness views, *Academy of Management* 54(2), 335.

Goergen, M. and L. Renneboog, 2004, Shareholder Wealth Effects of European Domestic and Cross-border Takeover Bids, *European Financial Management* 10 (1), 9-45.

Goergen, M., M. Martynova, and L. Renneboog, 2005, Corporate Governance Convergence: Evidence from Takeover Regulation Reforms in Europe, *Oxford Review of Economic Policy* 21 (2), 243-68.

Grinstein, Y., and P. Hribar, 2004, CEO Compensation and Incentives: Evidence from M&A Bonuses, *Journal of Financial Economics* 73, 119-143.

Horton, J., Y. Millo and G. Serafeim, 2012. Resources or Power? Implications of Social Networks on Compensation and Firm Performance, *Journal of Business Finance & Accounting*, 39(3-4), 399-426, 04.

Ishii, J. and Y. Xuan, 2010. Acquirer-Target Social Ties and Merger Outcomes. Working Paper, Stanford Graduate School of Business.

Larcker, D., Eric C. So, Charles C.Y. Wang, 2013. Boardroom centrality and firm performance, *Journal of Accounting and Economics*, 55(2–3), 225-250.

Liu, Y., 2013, Outside Options and CEO Turnover: The network effect, *Journal of Corporate Finance*, this issue.

Martynova, M. and L. Renneboog, 2011a, The Performance of the European Market for Corporate Control: Evidence from the 5th Takeover Wave, *European Financial Management* 17 (2), 208-260.

Martynova, M. and L. Renneboog, 2011b, Evidence on the International Evolution and Convergence of Corporate Governance Regulations, *Journal of Corporate Finance* 17 (5), 1531-1557.

Martynova, M. and L. Renneboog, 2009, What Determines the Financing Decision in Corporate Takeovers: Cost of Capital, Agency Problems, or the Means of Payment?, *Journal of Corporate Finance* 15 (3), 290-315.

Martynova, M. and L. Renneboog, 2008a, A Century of Corporate Takeovers: What Have We Learned and Where Do We Stand?, *Journal of Banking and Finance* 32 (10), 2148-77.

Martynova, M. and L. Renneboog, 2008b, Spillover of Corporate Governance Standards in Cross-Border Mergers and Acquisitions, *Journal of Corporate Finance* 14, 200-223.

Martynova, M. and L. Renneboog, 2006, Mergers and Acquisitions in Europe, in L. Renneboog (ed.), Advances in Corporate Finance and Asset Pricing, Amsterdam: Elsevier, 13-75

Matsusaka, J., 1993, Takeover Motives During the Conglomerate Merger Wave, *RAND Journal of Economics* 24, 357-379.

Omer, T. C., M. Shelley and F. Tice, 2012. Do Well-Connected Directors Improve Firm Performance? Working paper, University of Nebraska-Lincoln.

Renneboog, L. and Y. Zhao, 2011. Us Knows Us in the UK: On Director Networks and Managerial Compensation. *Journal of Corporate Finance*, *17*(4), 1132-1157.

Wu, Q., 2011. Information Conduit or Agency Cost: Top Managerial and Director Interlock Between Target and Acquirer. Working Paper, Arizona State University.

Table 1. (Connected) Acquisitions.

This table gives an overview of the number of acquisitions by year (Column (1)) over the period 1995 to 2012 and the percentage of acquisitions by year (based on all acquisitions over the whole period) (Column (2)). The table also shows the number (and percentage) of connected acquisitions in which the bidder and target firms share at least one director (Columns (3) and (4)). The last column shows the percentage of connected acquisitions (considering all acquisitions) by year. Source: SDC.

Year	(1) Number of acquisitions	(2) Distribution of all acquisitions over time (%)	(3) Number of connected acquisitions	(4) Distribution of connected acquisitions over time (%)	(5) % of Connected acquisitions by year
1995	33	4.44	2	2.86	6.06
1996	49	6.59	7	10.00	14.29
1997	51	6.86	9	12.86	17.65
1998	65	8.75	7	10.00	10.77
1999	90	12.11	4	5.71	4.44
2000	66	8.88	1	1.43	1.52
2001	30	4.04	1	1.43	3.33
2002	21	2.83	1	1.43	4.76
2003	40	5.38	4	5.71	10.00
2004	27	3.63	3	4.29	11.11
2005	53	7.13	7	10.00	13.21
2006	42	5.65	5	7.14	11.90
2007	44	5.92	2	2.86	4.55
2008	41	5.52	3	4.29	7.32
2009	34	4.58	5	7.14	14.71
2010	32	4.31	4	5.71	12.50
2011	19	2.56	5	7.14	26.32
2012	6	0.81	0	0	0
Total	743	100	70	100	
Average					9.42

Table 2. Acquisitions by Bidder and Target Industry.

This table shows the percentage of bidders and targets by industry. Source: SDC.

Bidder Industry Sector	%	Target Industry Sector	%
Agriculture	0.54	Agriculture	0.40
Chemicals	4.17	Chemicals	4.17
Construction	3.23	Construction	4.17
Finance	28.94	Finance	23.01
Food	3.1	Food	2.15
Furniture	0.4	Furniture	0.54
Manufacturing	9.29	Manufacturing	11.57
Mining	4.71	Mining	5.38
Printing	4.31	Printing	3.63
Retailing	9.29	Retailing	10.63
Services	21.27	Services	23.55
Telecommunication	5.65	Telecommunication	5.38
Textile	1.35	Textile	1.75
Transportation	2.29	Transportation	1.88
Utilities	1.48	Utilities	1.75

Table 3. M&A Transaction Characteristics.

Panel A shows the statistics on the number of M&A announcements per bidder over the sample period. Panel B reports the target's attitude towards the deal. Friendly means that the target board recommends the offer; Hostile reflects that the target board officially rejects the offer but that the bidder persists with the takeover. Panel C reports the different types of means of payment in the acquisition: all cash, all equity, or mixed offers. Panel D records the completion rate by subsample. Panel E reports the connections between bidders and targets. The dummy variable Connected equals one if the bidder and target share at least one director at the time of acquisition (according to the most recent information prior to the acquisition). The number of connections at the board level gives the number of shared directors between the bidder and target. St.dev. stands for standard deviation. Panel F presents the negotiation time of the acquisition which is defined as the difference between the announcement and completion dates of the takeover. Panel G reports the deal size (in million GBP), the relative deal size (deal size dividend by market value of the bidder), and whether target and bidder belong to the same sector which we call a focused transaction (dummy= 1, and 0 otherwise). Panel H reports the bidder CARs for the event windows: [-1,+1], [-5,+5] and [-10,+10]. Panel I reports the number of directors from the target joining the combined company after M&As. Note these statistics have been adjusted for the number of common directors to avoid double counting. Source: SDC, Datastream and BoardEX.

Panel A. Number of M&A Transactions by Bidder

Number of deals by bidder	Number of bidders	Percentage
1	374	72.90
2	92	17.93
3	26	5.07
4	7	1.36
5	7	1.36
6	5	0.97
7	2	0.39
Total	513	100

Panel B. Attitude towards the Takeover

Attitude	Frequency	Percentage
Friendly	704	94.75
Hostile	39	5.25
Total	743	100

Panel C. Payment Method

Payment method	Frequency	Percentage
Cash only	294	46.30
Equity only	202	31.81
Mixed	139	21.89
Total	635	100

Panel D. Takeover Completion Rate

Group	Completed Deals	Total takeover announcements	Success rate
All	609	743	81.97%
Not-Connected	542	673	80.53%
Connected	67	70	95.71%

Sample/mean difference test		Mean	Standard Deviation	T-statistic
	Not-Connected	0.805	0.014	2.95
	Connected	0.957	0.024	

Panel E. Connectedness of Bidder and Target

	N	Mean	St.dev.	Min	25%	Median	75%	Max
Connected (dummy)	743	0.094	0.292	0	0	0	0	1
Number of connections	743	0.164	0.799	0	0	0	0	17
Number of connections (for connected M&As)	70	1.743	2.019	1	1	1	2	17

Panel F. Negotiation Time

	N	Mean	St.dev.	Min	25%	Median	75%	Max
Successful deals	594	59.602	49.141	0	23	56	85	293
Withdraw offers	129	60.333	52.646	1	26	45	82	256
All	723	59.733	49.747	0	24	55	83	293

Panel G. Deal Size, Relative Deal Size, and Focused Transaction

	N	Mean	St.dev.	Min	25%	Median	75%	Max
Deal size (GBP m)	578	143.392	211.155	0.050	14.380	52.525	162.58	996.9
Relative deal size	544	1.733	20.770	0.0001	0.062	0.243	0.662	480.136[8]
Focused M&A	743	67.2%	47.0%	0	0	1	1	1

Panel H. Cumulative Abnormal Stock Returns for the Bidder

CAR (%)	N	Mean	St.dev.	Min	25%	Median	75%	Max
[-1,+1]	666	-0.47	6.35	-37.96	-2.36	0.00	1.34	63.75
[-5,+5]	666	-0.94	9.40	-64.85	-4.30	-0.13	1.89	94.32
[-10,+10]	666	-1.37	11.65	-72.28	-5.76	-0.21	3.22	52.75

Panel I. Target Director Retention

	N	Mean	St.dev.	Min	25%	Median	75%	Max
Retention (all)	743	1.292	3.287	0	0	0	1	36
Retention (connected)	70	2.729	4.370	0	0	1	3	18
Retention (unconnected)	673	1.143	3.119	0	0	0	1	36

---

[8] The outlier is Lasmo plc which acquired Monument Oil and Gas plc with a market value of GBP 1.25b, which leads to the very high relative deal size. Lasmo was acquired by ENI two years later.

Table 4. Bidder Characteristics.

This table summarizes the corporate governance and financial information on the bidders. Degree and Closeness are the centrality measures of the bidder in the director networks. They are calculated on the company level (C) as well as director level (D) (see Section 3). This table also reports board size, return on assets (ROA), cash-to-assets ratio, debt-to-assets ratio, and total assets (in millions GBP).

	N	Mean	St.dev.	Min	25%	Median	75%	Max
Degree (C)	341	6.21	5.17	0	2	5	9	29
Closeness (C)	311	0.41	0.14	0.07	0.25	0.43	0.55	0.59
Degree (D)	341	12.39	8.38	0	7	10	15	55
Closeness (D)	341	0.06	0.02	0.01	0.05	0.07	0.08	0.09
Board size	341	10.49	4.054	2	8	10	13	23
ROA (%)	615	4.44	6.53	-24.53	1.41	5.54	8.67	16.59
Cash-to-assets ratio (%)	511	31.36	26.13	0	10.71	23.47	47.91	99.46
Debt-to-assets ratio (%)	643	0.21	0.17	0	0.05	0.18	0.33	0.76
Total assets (in mil. GBP)	668	153.25	171.01	4.72	28.85	81.78	218.02	734.80

Table 5. Connected Bidders and Targets.

This table measures the number of directly connected firms through director interlocks for different samples: a. our takeover sample and b. random samples of bidder and target matched-up groups of firms (whereby the random samples are drawn from the universe of all listed UK firms). The first row (simulation group (1)) reports the number of connections between the bidders in the sample and random targets. The random targets belong to the same industry as the real target. For simulation group (2), we select a random company as a pseudo bidder for each target in the sample. Then, we examine whether the two companies are connected via directors. Simulation group (3) is based on a similar simulation exercise, but this time both the bidder and the target are randomly selected. The final row is based on the bidders and targets in the actual sample.

	Bidder	Target	Percentage of connected deals
Simulation group (1)	From M&A sample	Random	4.38%
Simulation group (2)	Random	From M&A sample	0.00%
Simulation group (3)	Random	Random	2.63%
Sample group	From M&A sample	From M&A sample	9.42%

Table 6. The Number of M&As.

This table reports the OLS regression with the total number of M&As (panel A) and the cumulated number of M&As (panel B) as the dependent variable. *Degree* and (normalized) *Closeness* are used to measure the bidder's centrality in the network. (C) and (D) stands for networks on the company level and the director (here taken as the CEO) level, respectively. *Board size* measures the number of executive and non-executive directors on the board. *Relative boardsize* is board size scaled by total assets. *ROA* is the return to assets of the bidder. *Cash to total assets* is the total cash and cash equivalents divided by total assets. *Debt to total assets* captures the bidder's leverage. We measure the size of the bidder by its *total assets* value (logarithm). Standard errors are between brackets; ***, **, * stand for statistical significance at the 1%, 5% and 10% level, respectively.

	Panel A: Total Number of M&As			
Average Degree (C) of bidder	0.044*			
	(0.023)			
Average Closeness (C) of bidder		0.996		
		(0.673)		
Average Degree (D) of bidder			0.017	
			(0.015)	
Average Closeness (D) of bidder				4.742
				(3.610)
Average Board Size	-0.004	0.013	0.006	0.013
	(0.034)	(0.035)	(0.034)	(0.032)
Average ROA	0.001	-0.001	0.001	0.002
	(0.007)	(0.008)	(0.007)	(0.007)
Average Cash-to-total assets	0.003	0.002	0.003	0.004
	(0.003)	(0.004)	(0.003)	(0.003)
Average Debt-to-total assets	1.307**	1.396**	1.349**	1.291**
	(0.564)	(0.622)	(0.568)	(0.567)
Average Total assets (Logarithm)	0.011	0.034	0.032	0.037
	(0.060)	(0.064)	(0.059)	(0.058)
Number of Observations	191	169	191	191
R-squared	0.0773	0.0704	0.0659	0.0683

Panel B: Cumulative Number of M&As

Degree (C) of bidder	0.079***			
	(0.018)			
Closeness (C) of bidder		0.954*		
		(0.568)		
Degree (D) of bidder			0.023**	
			(0.011)	
Closeness (D) of bidder				6.952**
				(3.111)
Relative board size	0.403	0.914**	0.653*	0.840**
	(0.357)	(0.386)	(0.376)	(0.349)
ROA	0.002	0.001	0.002	0.002
	(0.005)	(0.006)	(0.006)	(0.006)
Cash-to-total assets	0.002	0.002	0.002	0.003
	(0.003)	(0.003)	(0.003)	(0.003)
Debt-to-total assets	1.382***	1.283***	1.403***	1.188***
	(0.429)	(0.484)	(0.445)	(0.444)
Total assets (Logarithm)	-0.052	0.023	0.002	0.027
	(0.045)	(0.045)	(0.045)	(0.041)
Number of Observations	258	231	258	258
R-squared	0.1645	0.1078	0.1125	0.1155

Table 7. The Takeover Success Rate.

This table reports the logit regression results of the success rate of M&A transactions: the dependent variable equals 1 if the M&A was successful, and 0 if withdrawn. The network variables are: *Connected (dummy)* is a dummy variable which equals one if the bidder and target is connected via common director(s); *Number of connections* is the number of common directors; *Degree and (normalized) Closeness* measure the bidder's centrality in the network with (C) and (D) representing networks at the company level and CEO level, respectively. We control for: *Same sector (dummy)* equals one if the bidder and target belong to the same industry; *Hostile (dummy)* is one if the target's board rejects the bid; *All cash payment (dummy)* equals one if the transaction is performed by means of an all-cash payment, and zero in case of all-equity or mixed payment; *Relative deal size* is the transaction value in GBP scaled by the market capitalization of bidding company. Standard errors are between brackets; ***, **, * stand for statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bidder and target are connected (dummy)	0.834**					
	(0.364)					
Number of connections between bidder and target		0.317*				
		(0.188)				
Degree (C) of bidder			0.091***			
			(0.033)			
Closeness (C) of bidder				0.716		
				(0.802)		
Degree (D) bidder					0.046**	
					(0.021)	
Closeness (D) of bidder						3.985
						(4.573)
Same sector (dummy)	-0.046	-0.047	-0.220	-0.149	-0.222	-0.228
	(0.157)	(0.156)	(0.264)	(0.269)	(0.263)	(0.260)
Hostile (dummy)	-1.527***	-1.524***	-1.784***	-1.704***	-1.746***	-1.673***
	(0.253)	(0.253)	(0.443)	(0.423)	(0.443)	(0.419)
All cash paym. (dummy)	0.295**	0.285**	0.072	0.299	0.198	0.246
	(0.143)	(0.142)	(0.236)	(0.231)	(0.223)	(0.220)
Relative deal size	-0.0004	-0.0005	0.0001	0.001	0.0002	0.001
	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.004)
Number of Obs.	542	542	256	231	256	256
R-squared	0.1186	0.1115	0.161	0.1263	0.1407	0.1139

Table 8. Negotiation Time.

Panel A reports the (left censored) Tobit regression results of the negotiation time in M&A transactions. Negotiation time is the difference between announcement and accomplishment dates. Two network variables are used to measure the connectedness between the bidder and target: *Connected (dummy)* equals 1 if the bidder and target is connected via common director(s) and 0 otherwise. *Number of connections* is the number of common directors between bidder and target. Degree and (normalized) closeness are used to measure the bidder's centrality in the network. (C) stands for networks on the company level. We use four variables to control for deal nature and for the bidder's characteristics: *Same sector (dummy)* equals 1 if the bidder and target belong to the same industry; *Hostile (dummy)* is 1 if the target's board rejects the bid (for whatever reason); *All cash payment (dummy)* equals 1 if an all-cash offer is made, and 0 in case of all-equity or mixed offers; *Relative deal size* is the transaction value in GBP scaled by the market capitalization of bidding company; *Cash-to-total assets* is calculated as the total cash and cash equivalents divided by total assets; *Debt-to-total assets* is the capital structure of bidder. The bidder's size is the logarithm of *total assets* value (book value). Panel B expands the previous models by including the centrality measures at the company level. Standard errors are between brackets; ***, **, * stand for statistical significance at the 1%, 5% and 10% level, respectively.

	Panel A: Negotiation time			
	Success		**All**	
Bidder and Target are	-21.141**		-21.501**	
connected (dummy)	(8.787)		(8.902)	
Number of connections		-9.955**		-10.119**
between bidder and target		(4.899)		(4.965)
Same sector (dummy)	-8.973	-9.401	-7.690	-8.041
	(5.920)	(5.945)	(5.587)	(5.606)
Hostile (dummy)	36.554**	37.297**	9.714	10.254
	(17.564)	(17.597)	(10.782)	(10.795)
All cash payment (dummy)	-42.360***	-42.040***	-37.011***	-36.746***
	(5.821)	(5.829)	(5.381)	(5.387)
Relative deal size	1.960	1.987	-0.043	-0.034
	(1.703)	(1.707)	(0.788)	(0.790)
ROA	0.098	0.099	0.100	0.101
	(0.142)	(0.142)	(0.137)	(0.137)
Cash-to-total assets	0.056	0.074	0.042	0.057
	(0.116)	(0.117)	(0.109)	(0.109)
Debt-to-total assets	0.364	3.234	-0.749	1.656
	(19.119)	(19.085)	(17.852)	(17.829)
Total assets (logarithm)	8.815***	8.705***	6.787***	6.684***
	(1.676)	(1.678)	(1.574)	(1.575)
Number of Observations	331	331	392	392
R-squared	0.0244	0.0238	0.016	0.0155

	Panel B: Negotiation time			
	Success		All	
Connected (dummy)	-26.635**		-29.992**	
	(13.256)		(13.324)	
Number of connections		-18.860**		-21.006**
		(8.678)		(8.735)
Degree (C)	2.759**	2.811**	2.076**	2.126**
	(1.099)	(1.097)	(1.031)	(1.030)
Closeness (C)	-75.141**	-77.875**	-57.779**	-60.904**
	(30.220)	(30.101)	(28.252)	(28.160)
Same sector (dummy)	-5.455	-6.317	-5.110	-5.939
	(8.910)	(8.949)	(8.585)	(8.620)
Hostile (dummy)	82.080**	83.151**	33.939*	34.520*
	(37.051)	(36.981)	(18.114)	(18.072)
All cash payment (dummy)	-40.198***	-40.173***	-38.729***	-38.671***
	(8.568)	(8.560)	(7.990)	(7.984)
Relative deal size	0.114	0.078	-0.329	-0.350
	(2.170)	(2.167)	(1.244)	(1.243)
ROA	-0.279	-0.249	-0.115	-0.086
	(0.325)	(0.326)	(0.316)	(0.316)
Cash-to-total assets	-0.243	-0.228	-0.125	-0.109
	(0.193)	(0.193)	(0.172)	(0.172)
Debt-to-total assets	3.998	8.469	3.523	7.926
	(25.918)	(25.810)	(24.697)	(24.600)
Total assets (logarithm)	2.657	2.348	2.422	2.111
	(3.004)	(3.003)	(2.795)	(2.795)
Number of Observations	166	166	192	192
R-squared	0.0255	0.026	0.0193	0.0198

Table 9. The Means of Payment.

Panel A presents the results of logit regressions on the type of means of payment in the offer. The dependent variable in Models (1) equals 1 if the M&A is concluded with an offer that includes equity (an all-equity transaction or a mixed payment), and equals zero in case of an all-cash payment. In Models (2), we test the use of offers involving cash (in case of cash or mixed payment the dummy equals one, and equals zero in case of an all equity offer). *Connected (dummy)* equals one if bidder and target is connected via common director(s). *Number of connections* is the number of directors that a bidder and target share. *Same sector (dummy)* equals one if the bidder and target are from the same industry. *Hostile (dummy)* is one if the offer is (initially) rejected by the target's board. *Relative deal size* is the transaction value scaled by the market capitalization of bidding company. *ROA* is the bidder's return to assets. *Cash-to-total assets* is the total cash and cash equivalents divided by total assets. *Debt-to-total assets* is of the bidder's leverage. Size is *total assets'* book value (logarithm). Panel B gives the results of Tobit (left and right censored) regressions on the means of payment. The dependent variable is the percentage of cash in the offer. Standard errors are between brackets; ***, **, * stand for statistical significance at the 1%, 5% and 10% level, respectively.

	Panel A: Type of Offer			
	(1)		(2)	
	All equity or mixed payment		All cash or mixed payment	
Connected (dummy)	0.646*		-0.936**	
	(0.357)		(0.366)	
Number of connections		0.3011		-0.343*
		(0.204)		(0.203)
Same sector (dummy)	0.168	0.177	-0.147	-0.151
	(0.228)	(0.228)	(0.259)	(0.258)
Hostile (dummy)	0.332	0.315	-0.723	-0.656
	(0.463)	(0.462)	(0.463)	(0.461)
Relative deal size	0.254*	0.251*	-0.003	-0.002
	(0.137)	(0.137)	(0.033)	(0.032)
ROA	-0.007	-0.007	0.015**	0.015**
	(0.006)	(0.006)	(0.006)	(0.006)
Cash to total assets	0.003	0.002	-0.002	-0.002
	(0.004)	(0.004)	(0.005)	(0.005)
Debt to total assets	0.227	0.149	1.277	1.411
	(0.734)	(0.731)	(0.878)	(0.872)
Total assets (logarithm)	-0.217***	-0.212***	0.300***	0.289***
	(0.065)	(0.065)	(0.077)	(0.075)
Number of Observations	403	403	403	403
R-squared	0.0670	0.0651	0.1077	0.1004

	Panel B: Percentage of Cash in Offer	
Connected (dummy)	-87.504**	
	(35.802)	
Number of connections		-36.905*
		(19.948)
Same sector (dummy)	-16.747	-17.626
	(22.485)	(22.630)
Hostile (dummy)	-55.774	-53.178
	(43.862)	(44.009)
Relative deal size	-3.310	-3.280
	(3.084)	(3.100)
ROA	1.148*	1.160*
	(0.601)	(0.605)
Cash to total assets	-0.218	-0.166
	(0.434)	(0.437)
Debt to total assets	31.656	41.564
	(71.288)	(71.364)
Total assets (logarithm)	29.581***	29.078***
	(6.920)	(6.913)
Number of Observations	395	395
R-squared	0.033	0.0312

Table 10. Target Director Retention in the Combined Firm.

The table reports the results of regressions for the retention of the targets' directors in the combined company subsequent to the M&A. The dependent variable in Models (1) (Poisson model) is the number of unconnected targets' directors joining the combined company's board while this variable in Models (2) (OLS) is the number of retained directors as a percentage of the bidder's board. Two variables are used to measure the connections between bidder and target: *Connected (dummy)*, a dummy variable which equals 1 if bidder and target are connected via (a) director(s); *Number of connections,* the number of directors which bidder and target have in common. *Same sector (dummy)* equals one if bidder and target are from the same industry. *Hostile (dummy)* is 1 if the M&A is considered as hostile by the target. *All cash payment (dummy)* equals one if the transaction is completed with an all-cash payment and zero in case of an all-equity or mixed offer. *Relative deal size* is the transaction value scaled by the market capitalization of bidding company. *ROA* is the bidder's return on assets. *Cash-to-total assets* is calculated as the total cash and cash equivalents divided by total assets. *Debt-to-total assets* is used to measure the capital structure of bidder. The size of the bidder is the *total assets* value (logarithm). Standard errors are between brackets; ***, **, * stand for statistical significance at the 1%, 5% and 10% level, respectively.

	(1)		(2)	
	Total Retention		Total Retention/Board Size	
Connected (dummy)	0.653***		0.127	
	(0.103)		(0.080)	
Number of connections		0.381***		0.094**
		(0.046)		(0.044)
Same sector (dummy)	0.400***	0.446***	0.081	0.088*
	(0.094)	(0.095)	(0.054)	(0.054)
Hostile (dummy)	-0.484**	-0.486**	-0.111	-0.110
	(0.218)	(0.218)	(0.120)	(0.119)
All Cash	-0.505***	-0.490***	-0.056	-0.056
	(0.086)	(0.086)	(0.050)	(0.049)
Relative deal size	-0.023	-0.023	-0.001	0.0003
	(0.018)	(0.018)	(0.008)	(0.008)
ROA	-0.006***	-0.006***	0.003	0.003
	(0.002)	(0.002)	(0.002)	(0.002)
Cash-to-total assets	0.004**	0.003*	0.002*	0.002*
	(0.002)	(0.002)	(0.001)	(0.001)
Debt-to-total assets	-1.051***	-1.089***	-0.067	-0.088
	(0.302)	(0.299)	(0.155)	(0.154)
Total assets (logarithm)	0.108***	0.104***	-0.007	-0.006
	(0.024)	(0.024)	(0.016)	(0.015)
Number of Observations	403	403	220	220
R-squared	0.0744	0.0806	0.0566	0.0662

Appendix A: Variable Definitions.

Variable Name	Description	Source
Dependent variables		
Takeover success rate	Equals 1 if the M&A was successful, and 0 if withdrawn	Thomson Reuters SDC
Negotiation time	The gap between the announcement of the deal completion or failure of the negotiations and the first public announcement of that takeover negotiations are taking place	Thomson Reuters SDC
All equity or mixed payment	Equals 1 if the M&A is completed with an all-equity or mixed payment (equity and cash, and potentially with loan notes)	Thomson Reuters SDC
Cumulative abnormal stock returns (CARs)	Cumulative abnormal stock return over an event window around the first public announcement	Datastream, calculation
Total director retention	The number of target directors joining the board of the bidding company subsequent to the takeover transaction	BoardEx, Manifest, Thomson Reuters One Banker
Director retention as a percentage of bidder board	Total director retention divided by the bidder's board size priori to M&A	Boardex, Manifest, Thomson Reuters One Banker
Centrality and connections		
Degree (C)	Number of companies connected by common directors	Boardex,Manifest, calculation
Degree (D)	Number of directors connected to the bidder CEO	Boardex,Manifest, calculation
(normalized) Closeness (C)	The inverse of the sum of geodesic distances from bidder to all other companies, scaled by total number of reachable companies in the network	Boardex,Manifest, calculation
(normalized) Closeness (D)	The inverse of the sum of geodesic distances from bidder CEO to all other directors, scaled by total number of reachable directors in the network	Boardex,Manifest, calculation
Connected (dummy)	Equals 1 if the bidder and target have directors in common	Boardex,Manifest, Thomson Reuters SDC
Number of connections	The number of shared directors between bidder and target	Boardex,Manifest, Thomson Reuters SDC
Number of connections/directors	Number of connections divided by the bidder's board size	Boardex,Manifest, Thomson Reuters SDC
M&A characteristics		
Same sector (dummy)	Equals 1 if the bidder and target belong to same sector	Thomson Reuters SDC
Hostile (dummy)	Equals 1 if the M&A is hostile	Thomson Reuters SDC
All cash payment (dummy)	Equals 1 if the M&A is paid in cash only	Thomson Reuters SDC
Relative deal size	Transaction value (in GBP) scaled by the market capitalization of bidding company	Thomson Reuters SDC, calculation
Total relative deal size	The sum of the transaction values of all M&As in a financial year scaled by the market capitalization of bidding company	Thomson Reuters SDC, calculation
Multiple deals	The number of M&As announced on the same day by the bidder	Thomson Reuters SDC
(Cumulative) number of M&As	The number of M&As by a bidder over the sample period	Thomson Reuters SDC
Bidder characteristics		
ROA (%)	Net income prior to tax and interest divided by total	Datastream

	assets, and then multiplied by 100	
Relative board size	Board size divided by total number of directors on the board	Boardex,Manifest,Datastream, calculation
Cash to total assets (%)	Total cash and cash equivalents divided by total assets, and then multiplied by 100	Datastream
Debt to total assets (%)	Sum of short-term and long-term debt divided by total assets, and then multiplied by 100	Datastream
Total assets	Sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets. We take the logarithm of total assets.	Datastream

about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities.*

The ECGI produces and disseminates high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It draws on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

www.ecgi.org

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (www.ecgi.org/wp) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Finance.html
Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html

www.ecgi.org\wp