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Social Connections, Reference Point and Acquisition Premium

by

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Abstract

This paper examines the impact of acquirer-target social connections along with the target 52-week high (Baker, Pan, & Wurgler, 2012) on acquisition premiums. We show that acquisition premium is more sensitive to first-degree connection than the reference point, suggesting that information is the main driving force for determining acquisition premiums. The findings also indicate that connected directors are more likely to favour firms where they hold higher positions and negotiate favourable premiums. Acquirers pay lower premiums when target directors are retained in the new entity. Connected acquirers are also more likely to finance their deals with equity. Overall, this paper provides support to the information flow hypothesis that acquirers with social connections have better access to target information and enhanced bargaining power in negotiations.

1. Introduction

Social network studies have attracted considerable interest from researchers. A growing body of literature has introduced social network theory into M&A studies and explored the impact of social connection on takeover outcomes. These studies emphasise the social ties between acquirers and targets but find mixed results in terms of the effects of social connection. On the one hand, acquirers with a social connection would benefit from the information advantage and be better able to determine the target's true value, therefore enhancing their bargaining power in negotiation and paying a lower premium for the target (Cai & Sevilir, 2012; Mol, 2001; Myers & Majluf, 1984; Schoorman, Bazerman, & Atkin, 1981). On the other hand, social connection could raise issues (Ishii & Xuan, 2014) such as over-trust, familiarity bias (Cao et al., 2009), social conformity (Cialdini & Goldstein, 2004) and overconfidence of acquirer management (Roll, 1986), therefore increasing the likelihood of overpayment and leading to inefficient and unprofitable transactions.[1]

Motivated by the conflicting results, we re-examine the social links between acquirers and targets and provide further evidence for the role of social connection in the takeover process. Specifically, this study concentrates on the relationship between acquirer-target connection and acquisition premium by incorporating the target's 52-week reference point. Acquisition premium is defined as offer price, as the log percentage difference from the target's share price four weeks before the M&A deal announcement (Baker et al., 2012). Previous studies indicate that a premium is not only an important measurement for the market to evaluate takeover transactions for bidders and targets but also strongly influences merging firms' financial situations and post-acquisition performance in the short and even the long term (Alexandridis, Fuller, Terhaar, & Travlos, 2013; Alexandridis, Mavrovitis, & Travlos, 2012; Ayers, Lefanowicz, & Robinson, 2003; Holmén, Nivorozhkin, & Rana, 2014; Schwert, 1996). More importantly, among the indicators of takeover outcomes, acquisition premium is directly and largely affected by connection, since premiums best reflects the information advantage and

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[1] Familiarity bias describes the observation that individuals prefer familiar choices or decisions, avoiding any changes from the status quo (Cao et al., 2009). Social conformity refers to the bias that individuals are likely to follow the opinions of their peers instead of pursuing their own personal beliefs (Cialdini & Goldstein, 2004). This leads to inefficient negotiations between acquirer and target, in which the respective shareholders' interest is not properly represented.

bargaining power in the negotiations between acquirers and their targets. Hence, analysing premiums could better verify the information hypothesis of social network studies.

This paper introduces a psychological reference point (Baker et al., 2012) to examine what plays a determining role in target valuation and bid premium. According to Baker et al. (2012), acquisition partners are highly affected by the anchoring effect in pricing targets and negotiating premium. 52-week high price represents the recent peak price achieved by a firm in the past 52 weeks (Baker et al., 2012). The 52-week high is easily obtained and widely cited as firm valuation measure in the financial media and management reports. Both acquirers and targets regard a target's 52-week high as a psychological reference point for target valuation and rely heavily on this psychological anchor when negotiating their offer premium.[2] A higher target 52-week high implies a higher bid premium. Such a significant and positive relationship has been widely confirmed by recent studies (Alexandridis et al., 2013; Betton, Eckbo, Thompson, & Thorburn, 2014). By involving reference point theory (Baker et al., 2012) as an additional testing framework, this study establishes a more appropriate research framework to investigate whether acquisition premium is more affected by the acquirer's social network or a psychological anchor. In this paper, we adopt two types of cross-firm connections based on the BoardEx database: first-degree and second-degree connections. A first-degree connection refers to a situation in which a board director or executive serves on both acquiring and target firm boards prior to the deal announcement, while a second-degree connection happens when two individuals, respectively from the acquirer and target firm, have social ties through past experience (such as employment history or educational background)[3]. First-degree connection links bidders with targets via the same individual director, while second-degree connection involves two directors and connects merging parties via the third firm. Therefore, a first-degree connection is a more direct and closer relation between acquirers and targets than a second-degree connection. Hence, information obtained through a first-degree connection is more comprehensive and accurate, resulting in more precise valuation. Moreover, first-degree connections could better smooth

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[2] The target 52-week high is defined as the target's highest stock price over the period from 365 days to 30 days before the takeover announcement, denoted as the log percentage difference of the target stock price 30 days before the takeover announcement (Baker et al., 2012).

[3] BoardEx considers different relationship types. Possible routes are classified as follows: Quoted, Non-Quoted, Not for Profit, Education and Other. The latter contains connections that cannot be distinguished in any other allocations, for instance military service. Thus, such a connection could be non-professional or, rather, not business related.

the information exchange and communication between merging parties, leading to greater bargaining power and stronger impact in the negotiation of premium.

We empirically test the impact of social connection by using a sample of 1,502 US M&A deals between 2001 and 2016, out of which 15.18% are connected either by first- or second-degree connections. We find that the existence of social connection reduces premium by 6.53% relative to non-connected transactions. In first-degree connected deals, acquiring firms pay on average 11.33% less premium than in takeovers with no connection. The findings provide evidence that bidders could benefit from social connection by being better able to estimate targets' true value and improve their own bargaining power, therefore paying lower acquisition premiums. In particular, this information advantage is strengthened for bidders with a first-degree connection, since acquirers would have better communication during negotiation, helping them secure a much lower and more favourable offer premium.

We further control for the reference point – target 52-week high – in the premium analysis. According to Baker et al. (2012), target 52-week high is positively related with bid premium. We divide the full sample into three groups based on the target 52-week reference point. Compared with the premiums paid in non-connected deals, connected acquirers pay 2.94% less within the group of low target 52-week reference points and 10.61% less within the group of high 52-week reference points. This indicates that connected acquirers are less affected by the target's 52-week reference point. The greater influence of first-degree connection than reference point is supported by the multivariate analysis. In particular, we observe that first-degree connections are negatively related to premiums, while we find no significant relation between target 52-week reference point and premiums after controlling for year and industry fixed effects. The results indicate that first-degree connection has a stronger effect than target reference point in determining the amount of premium. The findings indicate that connected acquirer bargaining power is substantially increased, such that merging firms ignore the reference point when valuing the target during negotiation. Therefore, information advantage, rather than reference point, is the main determinant of the acquisition premium in deals with a first-degree connection.

For robustness reasons, we focus solely on the CEO dimension. We examine cases where the

CEO himself/herself connects the two merging firms. Based on this definition, CEO connections are subdivided into CEO first-degree connections and CEO second-degree connections. We find that CEO connections significantly reduce the premium paid by acquirers by 12.50% in general and by 15.25% in first-degree connected deals respectively. The finding can be attributed to more accurate information provided by target CEOs and their powerful role in decision-making.

In addition, we explore incentives of why connected directors favour acquirers over targets. We find that acquirers pay a lower premium when retaining directors who link acquirers and targets. In first-degree connected deals, the retention of connected directors leads to significantly lower premium (13.17%). All the interlocking directors in this sample were offered directorship roles/positions in the new/merged firm. In second-degree connected deals, acquirers that retain connected directors pay 6.26% lower premium than firms that offer no board seats. These connected directors obtain more benefit and power from acquiring firms, working in the best interests of acquirers and resulting in lower premium. In addition, acquisitions in which connected directors hold equivalent level positions in both the bidder and the target firm (48.48%) are associated with average 28.20% premium, significantly lower than the 46.94% premium in deals where the director holds a higher position in the target. Therefore, connected directors have self-incentive to assist in the completion of takeover deals and remain in the combined firm. In deals with second-degree connection, acquirers that recruit connected target directors to the new board are more likely to pay lower premium, since a board seat in the combined firm is secured. Hence, target connected directors have strong self-incentive to accelerate the acquisition process and compromise on lower acquisition premium, resulting in deviation from target shareholders' interest.

Finally, we examine the impact of connections on the medium of payment in mergers and acquisitions. Bidders in connected transactions are prone to finance acquisition with their overvalued stock. Due to information asymmetry, targets' shareholders run the risk of accepting bidders' overvalued equity. Connections between bidders and targets can increase trust and information flow; therefore, targets' shareholders can better value bidder stock, leading to a higher likelihood of equity payments.

We contribute to the current literature in several ways. First, we add to the existing body of literature by taking into account the social ties between acquirers and targets. We provide evidence that the measurement of target value not only depends on the firm's previous stock, operating and financial situation, but is also largely affected by the invisible social relations between acquirers and targets. In addition to Cai and Sevilir (2012), who provide similar evidence, we introduce the target 52-week high as a reference point for the existing framework. To our knowledge, we are the first to incorporate reference point theory (Baker et al., 2012) in premium analysis. According to Baker et al. (2012), target 52-week high is an important reference point for both acquirers and targets to price the target during negotiation. On the one hand, we verify a positive relation between target 52-week high and acquisition premium. On the other hand, we find that in first-degree connected deals, acquisition premium is not affected by the target 52-week high and is substantially decreased by the existence of a first-degree connection. That is, information advantage in first-degree connections significantly enhances acquirers' bargaining power and generates a much greater influence on the offer premium than reference point. Information is the main determinant of acquisition premium, rather than target 52-week high. We verify the information hypothesis in cross-firm connections, while previous studies draw ambivalent conclusions regarding the impact of social connections on takeover activities.

Another contribution relates to the method of payment. Few studies consider the impact of social connection on the choice of takeover timing and payment method. In addition to Rhodes-Kropf, Robinson and Viswanathan's (2005) theoretical explanation of why targets accept bidders' overvalued equity, we show that a close bidder-target relationship plays an important role in explaining this fact. Renneboog and Zhao (2014) use a UK sample and demonstrate that connected deals are more likely to be paid with stock, attributed to the board effect. We employ a US sample and enrich the view by analysing the pre-announcement stock performance of both acquirers and targets.

We further contribute to studies on corporate governance and directorship. Unlike Renneboog and Zhao (2014), who find that target directors that are connected with bidder directors are more likely to be invited to participate in the new board, we show that this has a further impact on determining acquisitions premium. We provide new evidence that first-degree

connected directors offer a lower premium if they hold more senior positions in the acquiring firms. In second-degree connected deals, a lower premium is offered to target firms if the target director is retained in the new board of the merged entity. We support previous findings (Harford, 2003; Wang, Sakr, Ning, & Davidson, 2010) that target directors would prioritise their own interests and compromise on acquisition premium at the cost of target shareholders' interests in order to obtain directorship in combined firms.

The paper is structured as follows. Section 2 presents the literature review. Section 3 presents the development of our hypotheses. In Section 4 we describe our data and methodological approach. Section 5 connects our empirical results with our hypotheses and draws the first interpretation of our results. Finally, Section 6 concludes and summarises our research.

2. Literature review

The main characteristic of social ties is that connection enables the flow of resources through a given network of individuals (Wasserman & Faust, 1994). Information is among the most important resources in the business world, since individuals and companies suffer from information asymmetry (Myers & Majluf, 1984). In other words, it is a fact that one entity has more information than another.

Recent studies on social networks indicate that social connections have both a positive and a negative impact on corporate performance and investment decisions. A considerable number of studies confirm the existence of information advantage in social networks. For example, Uzzi (1999) suggests that firms that are socially linked with middle-market banking have a lower cost of capital than those without a social connection. Engelberg, Gao and Parsons (2012) find that commercial banks deliver more favourable financing terms to connected firms due to the improved information and monitoring arising from that connection, including a lower interest rate, higher credit rating and better stock performance. Cai and Sevilir (2012) address the board connection between acquiring firms and target firms and investigate its impact on acquisition performance. The findings show that social connection significantly increases the announcement return for acquirers and the combined entity. Moreover, bidders with a first-degree connection pay a lower acquisition premium and transaction cost,

measured by total investment bank fees. Second-degree connection improves the operating performance of combined firms in the long run. The results confirm the information advantage hypothesis in M&A studies. However, Cai and Sevilir (2012) do not explain why connections between bidders and targets only benefit bidding firms. One therefore asks, if only acquirers benefit from board connections, why are target firms willing to accept less favourable deal items?

However, Ishii and Xuan (2014) show that social connection has a negative effect on takeover activities due to issues of over-trust, familiarity bias and social conformity. Social connection via an individual network builds trust beyond single business transactions and last longer. Yet, over-trust leads to inefficient decision-making, resulting in inferior firm performance. Additionally, management (senior executives or directors) may over-trust the information they obtain through their personal network and overestimate the information quality as well as their power of control. Therefore, social connection may lead to the CEO hubris problem (Roll, 1986) and therefore negatively affect deal outcomes. Moreover, social connection may raise the issue of familiarity bias, which refers to a situation where individuals prefer to maintain the status quo and select familiar firms in their investment decisions. Therefore, firm management with social connections may prioritise familiar partners and neglect better business opportunities beyond their individual networks, resulting in less favourable investment decisions. Another issue raised in social connections is social conformity, which implies that individuals prefer to follow the decisions of the group rather than put forward their personal opinions (Cialdini & Goldstein, 2004). Similarly, social conformity may lead to inefficient decision-making and poor firm performance.

3. Hypotheses Development

In this section we develop our hypotheses based on the main theory of social networks, psychological reference point theory and M&A studies.

According to Baker et al. (2012), both acquiring and target firms regard the target 52-week high as a reference for the premium paid or received in the negotiation. In general, the settlement of takeover deals should be approved by target shareholders, management and

bidding firms. For the majority of target shareholders, calculating firm valuation is a complex and time-consuming task, which requires much information and accurate forecast of targets. Therefore, target shareholders would often search for easily available benchmarks for pricing targets. The target 52-week high is the recent peak price that a target firm achieved before takeover announcement, which may be attained or exceeded in the future. Target 52-week high is easily obtained and widely cited in the financial media, and therefore can be used as a reference point for target valuation. For target management, using target 52-week high price as a negotiation anchor would save time and effort in estimating firm valuation and communicating with shareholders. For acquiring firms, information shortage makes it more difficult to value and negotiate with target firms. Therefore, acquirers are likely to anchor target recent peak price in order to settle M&A transactions.

However, social connection could alter the target valuation and negotiation for acquisition partners. The presence of inter-firm connection facilitates information transfer and exchange via individual networks, thus reducing the information asymmetry between firms (Myers & Majluf, 1984). In M&A deals, social connection, especially first-degree connection, brings a large information advantage to acquiring firms. Connected acquirers have better access (Mol, 2001) to the target's information, which is more detailed, accurate and current than the target 52-week high to value the target firm.[4] If information is the main driver of lower premiums paid to target firms, closely connected bidders should pay lower premiums. Moreover, bidder-acquirer connection greatly improves acquirers' bargaining power (Cai & Sevilir, 2012; Schoorman et al., 1981) and weakens the effect of target reference point on premiums. Therefore, we hypothesise that:

H1: *After controlling for the 52-week high reference point, first-degree connected bidders pay lower premiums than non-connected bidders.*

Baker et al. (2012) introduce the psychological phenomenon of "anchoring-and-adjustment"

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[4] By definition, 52-week high is the peak price that the target reached at least one month before acquisition. Target valuation at takeover announcement may derive from the peak price. Therefore, target value estimated on the basis of peak price (target 52-week high) may not be accurate.

to explain the process of target pricing. "Anchoring-and-adjustment" suggest that individuals would select a preliminary estimate as an anchor (reference point), and then adjust towards the final decision or true value (Slovic & Lichtenstein, 1971; Tversky & Kahneman, 1974). In mergers and acquisitions, the peak price achieved by targets in the last 52 weeks is regarded as the anchor or reference point of target valuation. Acquirers would base their offer price on the reference point and make subsequent adjustments according to information and negotiation. Acquirer-target connection, especially first-degree connection, reduces information asymmetry and improves the bargaining power in the negotiation. Therefore, the existence of social connection positively affects the adjustment of bidding premium.

According to Baker et al. (2012), by anchoring high reference points (peak price of target firms), bidders are more likely to pay a higher premium and more likely to deviate from target's true value. However, lower target 52-week high represents a smaller difference between peak price in the last 52 weeks and recent share price. Anchoring low quantile of targets' 52-week high for premium is associated with low premiums. In the adjustment process, acquirers would revise their offer price towards the true value of target firms. Acquirers with first-degree connection have better access to target true value and better bargaining power in the negotiation, and therefore pay lower offer price in deals with higher target reference points. The adjustment in first-degree connected deals is larger and more sufficient when the target reference point is high. It is in this regime that the anchoring behavioural bias is more pronounced and the information advantage emanating from connections helps bidders adjust their valuation accordingly and pay relatively lower premiums. The adjustment effect of close connection is lower in the low quantile of reference points, as the anchoring effect is less pronounced. The additional information brought by connection may have less of an influence in reducing premiums. Therefore, we expect that:

H2: *The lower premiums paid by connected bidders should be more pronounced when the target 52-week reference point is high.*

Previous literature indicates that overlapping directors facilitate information transfer and

smooth communication between connected firms (Haunschild & Beckman, 1998; Salancik & Pfeffer, 1978). However, the contribution of resources and experience is highly affected by the organisation identification (Hillman, Nicholson, & Shropshire, 2006; Shropshire, 2010). Organisational identification, a concept in management studies, refers to how employees identify with or understand firms, and therefore affects employees' contribution to their work. Directors who hold positions on multiple boards have stronger organisational identification in the firms where they work as CEO/Chair. Therefore, interlocking directors would favour those firms and contribute more advice as well as knowledge to the organisation where they serve as CEO/Chair and have stronger organisational identification. Moreover, the position of CEO/Chair could bring more financial and non-financial benefit as well as power to interlocking CEOs. Hence, interlocking directors would act in the interest of firms where they hold higher and more important positions. Therefore, we expect that:

H3: Connected directors/executives are more likely to favour firms where they hold a higher position and negotiate favourable premiums.

Target directors are more likely to accept a lower premium in exchange for directorship in newly merged firms (Wang et al., 2010). Board seats in newly merged firms would signal the high quality and expertise of directors and bring more job opportunities, resources and network to the director (L. Bebchuk & Fried, 2004; Harford, 2003; Wang et al., 2010). Therefore, target directors may sacrifice shareholders' interest and compromise on premiums in order to remain on the new board. Moreover, if acquirers and targets successfully merge, target firms may not exist in the future. Retained directors who previously worked in targets are responsible for representing the interests of "future" shareholders in the combined firms. Hence, target directors with a higher likelihood of being retained are more likely to approve deals with a lower premium.

Furthermore, acquiring firms are willing to retain connected target directors (or senior executives) in newly merged firms. Previous literature finds that firms are willing to bring a "friend" or "someone they know" into the business due to the familiarity effect (Chen, Levy,

Martin, & Shalev, 2014; Cooney, Madureira, Singh, & Yang, 2015). To maintain a long-term relationship, "friends" may take into account the interests of their partners (Cohen, Frazzini, & Malloy, 2008; Cooney et al., 2015; Hochberg, Ljungqvist, & Lu, 2007). Moreover, target directors (or senior executives) who are linked with acquiring firms via personal network have better acknowledgement of targets and acquirers and therefore could accelerate the post-merger integration process (Li & Aguilera, 2008). Therefore, acquirers tend to retain target directors with whom they have a social connection. Overall, we expect that:

H4: Acquirers pay a lower premium when connected target directors/executives are retained in the newly merged firms.

CEOs play a more powerful and essential role in boards (L. Bebchuk & Fried, 2004; L. A. Bebchuk, Fried, & Walker, 2002; Daily & Schwenk, 1996; El-Khatib, Fogel, & Jandik, 2015; Finkelstein, 1992; Van Essen, Otten, & Carberry, 2015). L. Bebchuk and Fried (2004) propose a managerial power theory and indicate that CEOs dominate boards and have more bargaining power in negotiations, especially in matters of CEO compensation. The dominant role of managerial power could be attributed to the fact that board directors lack incentives to serve shareholders' interests. On the one hand, the selection of board members may be affected or controlled by CEOs (L. Bebchuk & Fried, 2004; Rosenstein, 1987; Zahra & Pearce, 1989). On the other hand, directors may compromise in exchange for financial benefit and business opportunities provided by CEOs. Moreover, directors would avoid conflicts with CEOs for social and physiological reasons, such as collegiality and friendship (L. Bebchuk & Fried, 2004).

CEOs have more accurate information than boards and are responsible for day-to-day operation and management activities. CEOs have superior information of their firm's state of operation and financial situation (Baysinger & Hoskisson, 1990). Boards serve in advising and monitoring management and corporate performance. Directors are not directly involved in daily operations (Zahra & Pearce, 1989). Board directors make decisions based on the information provided by management, and at times information transfers insufficiently

between CEOs and board.

Therefore, connection with CEOs is more valuable and efficient than connection with boards. Acquirers linked with target CEOs have greater information advantage and suffer less resistance from target firms. Acquirer CEOs who also sit on the target board would favour acquirers and negotiate lower premiums because they have more to gain in bidding firms. Hence, we expect that:

H5: *Acquirers with CEO connection, especially CEO first-degree connection, pay lower premiums than acquirers with board connection.*

Chemmanur, Paeglis, and Simonyan (2009) examine public takeover deals and find that acquirers are more likely to use cash deals when facing a greater extent of two-sided information asymmetry. Social connection, especially first-degree connection, reduces information asymmetry and improves the bargaining power of acquirers during negotiation, therefore increasing the likelihood of stock payments. The probability of deal completion affects acquirers' choice of payment method. Cash offers may signal the high valuation of targets and therefore could deter the potential rivals of bidding firms, leading to a higher probability of successful deals. For public acquirers, the prevention of competing bids outweighs the expected cost in information asymmetry. Connected acquirers have better access to target information and therefore better acknowledge the intrinsic value and operational and financial situation of target firms, as well as the bidder itself. Cai and Sevilir (2012) indicate that acquirers that are linked with targets are less likely to be involved in competing bid. Therefore, acquirers are more likely to use stock to pay for deals in socially connected deals.

Generally, in stock offers, targets are uncertain of acquirers' true stock valuation. Equity payment implies the overvaluation of bidding firms (Chang, 1998; Huang & Walkling, 1987; Martynova & Renneboog, 2009; Travlos, 1987). Targets would only accept equity payment when the stock offer exceeds the true value of target firms. Hence, acquirers take longer to negotiate and complete deals when the payment is made partly or entirely with stocks

(Golubov, Petmezas, & Travlos, 2012). Acquirer-target connection increases the trust and bargaining power between two parties. Targets in socially connected deals have better access to valuation of bidders' stock, increasing the likelihood of accepting equity payments. Moreover, in stock offers, a target's board of directors could exchange the shares of target firms for the shares of bidding and increase their voting power in the newly merged firms (Ghosh & Ruland, 1998). Therefore, a target's board would favour stock payment if they desire to maintain their influence in the new board. Additionally, target boards may face tax obligations when a deal is paid with cash (Travlos, 1987; Wansley, Lane, & Yang, 1983). Connected directors who previously worked in the target are more likely to be retained by the combined firms due to the familiarity effect (Chen et al., 2014; Cooney et al., 2015). Therefore, connected target directors tend to discourage cash offers due to personal interest. Therefore, we expect that:

H6: *Acquirers in connected deals are more likely to finance acquisitions with stock.*

4. Data

4.1. Data and selection criteria

The data for our analysis is gathered from different sources. We collect US takeover deal information over the period from 1st January 2001 to 31st December 2016 from the Thomson One database. The timeframe was selected to match the growing data availability of BoardEx, which started in 1999. [5] The original sample contains 140,418 deals. Because of the availability of information, we focus only on public transactions where both acquirer and target are quoted, leaving 4,750 observations. Moreover, we only include deals of at least $10 million, resulting in 3,809 deals. We only consider takeovers with a transfer of control. Specifically, we select transactions in which the acquirer obtained more than 50% ownership of the target, leaving 2,528 takeover bids. We drop another 1,026 observations where information is not available in the COMPUSTAT and CRSP databases. Finally, we obtain a

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[5] The BoardEx database is widely used when analysing social connections in a business context. Other studies using BoardEx include Engelberg et al. (2012) and Ishii and Xuan (2014). However, both studies automatically retrieve the data. We, on the other hand, manually check every cross-firm connection.

full sample of 1,502 M&A deals.

For the identification of social connections between acquirer and target companies, we access relationship data from BoardEx. These data were collected and linked manually using the Point-to-Point tool for each M&A deal.[6] If more than one company was listed with the same or a similar name, we hand-checked and compared the data by utilising our previously computed market values to identify the appropriate company. The classification of social connections is based on the BoardEx data. Connection includes both first-degree and second-degree connections. A first-degree connection classifies a CEO or board member that serves on both the acquirer's and the target's boards at the time of the deal announcement.[7] A second-degree connection represents a social tie at board level between two individuals respectively from the acquirer and target firms. For second-degree connections we allow any possible connection between two peers, including employment history and educational background.

We split the full sample into two subgroups: 228 deals with a social connection and 1,274 deals with no connection. We categorise the connected deals into 66 first-degree connected deals and 162 second-degree connected deals, in which only second-degree connected transactions are included. Furthermore, we reclassify the socially connected deals into 106 CEO-connected deals, in which either acquirer or target CEO links the bidding and target firms, and 122 board-connected deals, in which a board member is the connection between merging firms. Specifically, CEO-connected deals include 45 first-degree CEO-connected deals, where the CEO in the bidding or target firm serves as an executive, and 61 second-degree CEO-connected deals, in which acquirer or target CEOs share past experience with board members or executives in other merging firms. Likewise, deals with board connection consist of 21 first-degree board-connected deals, in which acquirer board members also serve on the target's board, and 101 second-degree board-connected deals, in which acquirer board members have social ties with target board members.

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[6] BoardEx's Point-to-Point tool allows us to manually control for connections between two companies. It has the advantage that we can personally select the companies' names.
[7] Herein, board member does not include CEO.

4.2. The sample

The sample consists of 1,502 M&A deals. Table 1 illustrates the number of M&A deals by year and industry of the acquirers. We classify deals into two main groups for our research, namely connected and non-connected deals. The connected subsample represents all M&A deals where we successfully identify a first- or second-degree connection. Otherwise, the deal is specified as non-connected. In general, the large number of M&A deals is distributed over the period from 2003 to 2006 and from 2014 to 2016, during which sixth (Alexandridis et al., 2012) and seventh merger waves (Mavis et al., 2016) occur.[8] Starting from 2014, the number and value of M&A transactions substantially increases in the US market. The highest proportion of connected deals falls within 2013 to 2016. The connected deals announced in 2013 to 2016 mainly occur in the finance industry and business equipment industry.

The industry classification is based on the acquirer's industry, according to the Fama-French 12-industry classification. It is evident that Finance and Business Equipment companies initiate most of the deals, together representing 58.39% of our entire sample. This pattern is also evident for our connected deals, where both industries account for 48.25% of all connected deals. Further, we observe that some industries only contain a few connected deals, for instance Consumer Durables or Consumer Non-Durables. To control for this inequality, we employ industry fixed effects in our multivariate analysis.

[Insert Table 1 About Here]

Table 2 presents the summary statistics for firm and deal characteristics. An explicit definition and the source for each reported variable is reported in Appendix A. Additionally, we conduct the Wilcoxon signed-rank test to analyse whether the differences between our sub-groups are statically significant. In general, we observe significant differences between connected and non-connected deals. The acquirers in connected deals have higher Tobin's Q, higher market values (MV) and greater returns on assets (ROA), implying that those companies have higher market valuation and outperform their peers in terms of profitability. Interestingly, we observe that connected targets have higher market value but lower Tobin's Q. In general,

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[8] Following Harford (2003), Mavis et al. (2016) identify the emergence of a seventh merger wave in banking, healthcare, real estate and trading, etc. industries over the period from 2011 to 2013.

acquirers have higher Tobin's Q than targets, implying that acquirers are relatively overvalued compared to targets (Dong, Hirshleifer, Richardson, & Teoh, 2006). The difference of Tobin's Q is larger between acquirers and targets in deals where merging parties are socially linked, which implies that the extent of misevaluation is more salient in connected deals.[9]

Due to the larger size of connected target firms, connected deals are substantially higher in terms of transaction value and relative deal size. All connected deals together represent 25.15% of the total transaction value of our sample. Interestingly, the average premium paid for connected targets is significantly lower (by 6.53%) compared to non-connected targets, while we do not observe a striking difference of target 52-week reference points between connected and non-connected deals. This is the first evidence supporting our first hypothesis, which states that connected bidders pay lower premium regardless of reference point. In addition, we find that connected deals are more frequently paid completely with stocks. The acquirers' run up, an indicator of overvaluation, is higher in connected deals, implying that connected acquirers are likely to time their acquisitions and proceed when their stock is overvalued. According to Travlos (1987) and Dong et al. (2006), acquirers tend to pay target firms with overvalued stocks. This could explain the lower acquisition premium in connected deals, since connected acquirers might finance transactions with overvalued stocks. Therefore, we need to control for the method of payment in our multivariate analysis.

[Insert Table 2 About Here]

Table 3 reports the correlation matrix of all variables in this study. As expected, we observe the strong correlation between premium and first-degree connection as well as target reference point (Baker et al., 2012). In line with Officer (2003), premiums are positively associated with cash payment and negatively related with stock payment. Premiums are significantly increased in tender offers and deals involving multiple bidding firms (Edmister & Walkling, 1985; Moeller, Schlingemann, & Stulz, 2004; Officer, 2003). Furthermore, socially connected deals are more likely to be financed with acquirers' equity. Larger-sized

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[9] In socially connected deals, Tobin's Q is on average 4.05 for acquirers, and 2.69 for targets, where in non-connected deals, the average Tobin's Q for acquirers and targets is 3.12 and 2.80, respectively.

bidders tend to select stocks as the medium of payment. Additionally, a positive relation is observed between stock payment and transaction value.

[Insert Table 3 About Here]

5. Empirical results

5.1. The impact of social connections and target 52-week reference point on acquisition premiums

5.1.1. Target 52-week high and acquisition premium

In this section, we test the reliability of target 52-week high in affecting offer premium. Following Baker et al. (2012), we employ target peak price over various horizons (13 weeks, 26 weeks, 39 weeks and 104 weeks prior to announcement date) as alternative target levels. Similar to target 52-week high, X-week high is calculated as the log percentage difference of the target's X-week high share price over the share price four weeks before the M&A deal announcement. Next, we use histograms to plot the density of the difference between offer price and target reference points (target 13-week high, 26-week high, 39-week high, 52-week high and 104-week high), following Baker et al. (2012). The red curve in each histogram below plots the normal distribution of the difference between offer premium and various target reference points. Except target 52-week high (histogram D), the average mean of normal distribution derives from zero. However, the offer premium centres on the target 52-week high, implying that target 52-week high is more accurate and reliable in gauging offer premium than other target reference points. For that reason, we employ the 52-week high as the main reference point for the analysis of the paper.

[Insert Figure1 About Here]

5.1.2. Univariate analysis

In this section, we undertake the univariate analysis and examine whether the relation

between social connection and premium would be affected by the value of target reference points. Table 4 reports average premiums paid in deals classified by target 52-week high and social connection. Specifically, we divide the full sample into three quantiles (low, medium, high), depending on the degree of log percentage difference between the 52-week high share price and the target's share price four weeks before the deal announcement. The high quantile represents a large gap between the target recent price (four weeks before announcement) and peak price during the past 52 weeks. According to reference point theory (Baker et al., 2012), acquiring firms in the high quantile would negotiate the offer price by anchoring higher target reference points and therefore tend to pay higher premiums, while bidders in the low quantile are expected to pay lower premiums. We further split the full sample into non-connected deals and connected deals (including first-degree and second-degree connected deals) and perform two-tailed t-test to examine the difference in premiums between pair-wise groups.

[Insert Table 4 About Here]

In Table 4, we observe that the acquisition premium increases progressively from the low quantile to the high quantile, which supports the findings in Baker et al. (2012). For each quantile, connected deals have lower average premiums than non-connected deals. The difference in average premiums between connected deals (Column 2) and non-connected deals (Column 5) is -7.39% in the medium quantile and -10.61% in the high quantile, both significantly different from zero at the 5% level. However, we observe no significant difference in the low quantile. The findings support Hypothesis 2, which indicates that the social connection effect on premium is more pronounced when the target 52-week high price is high.

Consistent with Hypothesis 1, the premium paid in highly connected deals (first-degree connection; Column 3) is significantly less than the premium in non-connected deals (Column 5) in all quantiles of the target 52-week high. Moreover, acquirers pay lower premiums in first-degree connected deals (Column 3) than in deals with second-degree connection. The results above imply that inter-firm connection reduces acquisition premiums. The closer connection between acquirers and targets has a more negative impact, since acquirers gain greater information advantage in first-degree connected deals.

Overall, the univariate analysis provides preliminary results and suggests that premiums are negatively affected by social connection. This negative effect does not seem to be affected by the target's 52-week high reference point.

5.1.3. Multivariate analysis

We further proceed with multivariate premium analysis to test the robustness of the previous finding. In Table 5, we regress acquisition premium against connection dummy variables (including variables for connection, first-degree connection and second-degree connection) which equal one if acquirers and targets are socially connected, and zero otherwise. Moreover, we introduce the target 52-week high as a reference point to gauge the anchoring effect in negotiation of premiums. Following Baker et al. (2012), we compute the log percentage difference of targets' 52-week high and target price four weeks before the announcement. We also include common variables of firm and deal characteristics in previous M&A studies, such as Tobin's Q (Officer, 2003; Schwert, 2000), relative size of the deal (Moeller et al., 2004), payment method, deal attitude (Schwert, 2000) and whether the bid involves multiple bidders (Walkling & Edmister, 1985). Additionally, we control both year and industry fixed effects in all models.

[Insert Table 5 About Here]

In Models 1 and 2, social connection, especially first-degree connection, is significantly negatively associated with acquisition premium, suggesting that social linkage between merging parties could significantly reduce premiums. In particular, the coefficient for first-degree connection is -0.4072 in Model 2, significantly different from zero at the 1% level. The finding demonstrates that the existence of a first-degree connection reduces the acquisition premium. However, the relation between second-degree connection and premium is insignificant in all models. These findings are in accordance with Cai and Sevilir (2012), who suggest that targets in higher-connection deals obtain lower premiums. The results can be explained by the greater information advantage associated with first-degree connections. Having a close connection with a target means that acquirers benefit from more accurate target information and enhance their bargaining power in the negotiation process.

Consistent with Baker et al. (2012), we observe that the target 52-week high reference point is positively associated with the acquisition premium in Model 3. The findings confirm that higher target 52-week highs result in higher acquisition premiums paid to targets. The strong negative relation between premiums and connections, especially for first-degree connections, remains robust after controlling for the target 52-week high in Models 4 and 5. The coefficients of target 52-week high become insignificant in Models 4 and 5 with fixed effects included. The connection variables reduce the coefficient and significance level of target 52-week high from significance (0.0386, significant at 1% in Model 3) to insignificance (0.0145 in Model 4; 0.212 in Model 5). The findings support our hypothesis and indicate that social connection has stronger explanatory power than target reference point in premium analysis. The findings could be attributed to the information advantage in the connection, especially in first-degree connections. The target reference point is public information for acquirers; therefore, it reflects limited target information. A first-degree connection largely reduces the information asymmetry between acquirers and targets, resulting in acquirers better comprehending a target's true value and having enhanced bargaining power in negotiations. Therefore, in connected deals, acquirers obtain more information about target valuation and could rely less on 52-week high to negotiate acquisition premium. Therefore, social connection, especially first-degree connection, outweighs the target reference point and plays a determining role in deciding premium.

Moreover, the increase in relative deal size decreases acquisition premium, in line with Alexandridis et al. (2013).[10] Premiums are higher in transactions financed with cash, tender offers (Schwert, 2000) or deals with lower target Tobin's Q ratios (Bargeron, Schlingemann, Stulz, & Zutter, 2008).

To further disentangle the effect between connections and the target 52-week reference point, in Table 6 we further split the full sample into three quantiles (low, medium, high) according to the target 52-week reference points. We analyse the relation between acquisition premium and social connection in the subsample of Low/High target 52-week high. In Model 1 and

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[10] The negative relation could be attributed to lower competition for large takeover transactions (Gorton et al., 2009), leading to less pronounced "winner's curse" (Alexandridis et al., 2010) and a lower probability of overpayment to targets (Alexandridis et al., 2013).

Model 2, the dependent variable is the connection variable. In Model 3 and Model 4, acquisition premium is regressed against first-degree and second-degree connections.

[Insert Table 6 About Here]

Generally, the relation between premium and connection, especially first-degree connection, is more negative and significant in the subsample of high target 52-week highs than in the group with low target 52-week highs. In Model 4, the coefficient for first-degree connection is -0.3937 in the high quantile, significant at the 1% level, while the coefficient in the low quantile is -0.5089 and statistically insignificant. As expected in the second hypothesis, first-degree connection has more pronounced effects in deals with higher target 52-week high reference points. Higher target 52-week high represents a larger gap between peak price and recent price of target firms.[11] Compared with low target 52-week highs, a high 52-week high is more likely to deviate from target true value, resulting in higher premiums paid. However, socially connected acquirers, particularly with a first-degree connection, could estimate firm value more accurately and negotiate a reasonable price due to their information advantage. Therefore, the negative impact of connection, particularly first-degree connection, is more pronounced in deals with a high reference point.

5.2 Why do directors favour acquirers and why do targets accept lower premiums?

The findings presented so far indicate that acquiring firms take over connected targets by paying lower premiums, especially when acquirers' and targets' boards share the same directors. According to agency theory, directors are recruited to represent shareholders' interests and act as a monitoring device. While directors are in general influenced by the target 52-week high, in socially connected deals, managers are not as influenced by the reference point and accept significantly lower acquisition premiums. In this section, we explore why directors are more likely to favour acquirers and why target boards are willing to be acquired with a low offer premium, and we try to explain the incentive from the seniority and retention point of view.

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[11] Following Baker et al. (2012), target 52-week high is computed as the log percentage difference between 52-week high price, the recent peak price achieved by target firms, and target price at four weeks before the takeover announcement.

5.2.1 Seniority impact on premium

In Table 7, we provide the univariate and multivariate evidence on the seniority and retention of connected directors and investigate the impact on premium. We first examine the positions of connected directors in acquisition partners and classify interlocking directors' board positions both in the acquirer and target firms (or connected directors in the second-degree connected deals, respectively from acquirers and targets) into the following categories: CEO, Chairman, independent director or common director.[12]. The first level includes the CEO and Chairman roles, while the second level includes the common directors and independent directors. Higher-level positions for acquirers (targets) indicate that the interlocking director holds a more important position in the acquirer (target) than in the target (acquirer). In our sample, 14.91% of connected directors hold higher positions and have more power in acquiring firms than in targets, while 66.67% of connected directors have the same level of board position in acquirers and targets. In first-degree connected deals, 33.33% of interlocking directors hold more important positions in acquirers, while 48.48% of interlocking directors are in positions at the same level.

Panel A lists the average premium in transactions classified by the seniority of connected directors. Two-tailed t-test is employed to examine the difference in average premiums between pair-wise groups. In general, acquirers pay significantly lower premium when connected directors hold the same level or a more important position in bidding firms, especially when acquirers and targets share interlocking directors. In first-degree connected deals, the acquisition premium is on average 13.17% when the director holds a higher and more powerful position in acquirers, while acquisition premium is 46.94% when directors hold a higher-level board seat in the target, indicating that directors favour firms in which they dominate. Acquisition premium is on average 28.20% in takeover deals in which directors hold positions at the same level as in acquisition partners, indicating that directors are prone to protecting acquirers' interests. In Panel C of Table 7, the first four models regress

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[12] In first-degree connected deals, board members who serve on both acquirer and target boards are called "interlocking directors".

premium on the independent variables related to seniority.[13] The coefficients of A_higher position are negative and statistically significant at the 1% level, implying that premium would be largely reduced when connected directors hold a higher position in acquirers. The results of multivariate analysis support the seniority hypothesis (Hypothesis 3). The findings could be explained by interlocking directors having stronger organisational identification in firms where the hold higher-level positions and therefore would contribute more important resources and valuable advice to the firms (Hillman et al., 2006; Shropshire, 2010). Therefore, interlocking directors who serve as CEO/Chairman in acquirers would favour bidding firms and negotiate lower premiums.

5.2.2 Retention effect on premium

Next, we investigate the retention of connected directors and its relation with premium. In first-degree connected deals, we find that all interlocking directors who serve in both acquirer and target firms continue to stay on the new board of combined firms after the acquisition, since interlocking directors have better understanding in both acquirers and targets and therefore could facilitate and accelerate the post-merger integration process (Li & Aguilera, 2008). In second-degree connected deals, target directors share experience (education, employment, etc.) with acquirer directors. In general, target directors are not likely to could continue to serve on the new board after takeovers are completed (Harford, 2003). However, in second-degree connected deals, 33.33% of target connected directors are retained on the board of the combined firm following takeover deals, implying that social connections with the acquirer's board plays an essential role in target directors' staying or leaving.

Panel B of Table 7 shows that acquirers that retain target connected directors pay lower acquisition premium (30.12%).[14] In second-degree connected deals, retention of target directors would reduce premium by 6.26% on average. These findings are in line with retention hypothesis, in which bidding firms pay lower premiums when retaining connected target directors. The conclusion is further supported by Model 5 and Model 6 in Panel C of Table 7. We observe a strong and negative relation between premium and the retention variable.

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[13] A_higher position refers to a situation where connected directors hold a higher-level position in bidding firms, while A_T same level position refers to connected directors in acquirers who serve in the same level positions as in target firms.
[14] In first-degree connected deals, all the interlocking directors are retained in the newly combined firms. Therefore, we do not show the univariate analysis of premium for first-degree connected deals.

The results can be explained by the fact that target directors may put their interests before shareholders'.

Harford (2003) documents that target boards would resist takeover bids or charge high acquisition premiums to compensate for their financial, information or network loss due to the loss of directorship. However, directors may compromise and neglect target shareholders' interest when their self-interest is satisfied. Similarly, Wang et al. (2010) provide evidence that target directors sacrifice shareholders' interests and accept lower acquisition premiums in exchange for directorship in combined firms. Moving to the board of the new combined firm would signal directors' high quality and expertise, resulting in more job opportunities. For retained directors, accepting low acquisition premiums can be regarded as protecting future shareholders' interest. Additionally, social links with acquirers would increase the likelihood of retention for target directors due to the familiarity effect (Cohen, Frazzini, & Malloy, 2008; Cooney et al., 2015; Hochberg, Ljungqvist, & Lu, 2007). Therefore, connected directors have more incentive to compromise on deal items in order to secure board seats and favour the interest of future shareholders.

Taken together, retaining connected directors is associated with low acquisition premiums and confirms that connected board directors in target firms have a strong incentive to complete acquisition even at the cost of shareholders' interest.

5.3. Alternative Proxy for Social Connection

El-Khatib et al. (2015) adopt CEO centrality to study the relation between acquisitions and within-firms' social connection; they indicate that takeover activities are strongly influenced by CEO centrality.[15] Therefore, we employ an alternative proxy between acquirers and targets as a robustness analysis for takeover premium. We reclassify the cross-firm connection into only CEO connections. Specifically, CEO connections refer to instances when acquirer or target CEOs act as a go-between for bidding firms and targets. CEO connections are further split into CEO first-degree connections, in which the acquirer (target)

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[15] CEOs with higher centrality negatively affect acquisition performance. CEO centrality qualifies the strength and importance of the CEO within top management in the aspects of performance, decision-making and dedication. Higher CEO centrality implies that the CEO plays a more essential and powerful role within the organisation.

CEO also works as a target (acquirer) board or management member. CEO connections are classified as second-degree if the acquirer or target CEO shares past experience with board members or executives in the counterpart firm.

Table 8 reports the relation between acquisition premium and CEO connection, including first-degree and second-degree connections. We also introduce the reference point – target 52-week high – in Model 2 and Model 4. In Model 5 and Model 6, we split the full sample into three quantiles (low, medium, high) and analyse the impact of CEO connection on acquisition premium in the subsample of low/high target 52-week highs. We control both year and industry fixed effects in all models.[16]

[Insert Table 8 About Here]

We observe that the coefficient for CEO connection is -0.3117, significant at 5%, while the coefficient for CEO first-degree connection is -0.5075, significant at 1% with target 52-week high controlled. The findings support the hypothesis of CEO connection and suggest that acquisition premium is strikingly reduced by CEO connection, especially first-degree connection. In Models 5 and 6, we find that the coefficients for the CEO connection variable are more significant when takeover deals are in the high quantile of target 52-week high. The coefficient for CEO first-degree connection is -0.8295 (insignificant) in the subsample of low target 52-week highs, and is -1.0470 (significant at 1%) in the subsample of high target 52-week highs. The results reveal that CEO connection, especially first-degree, is more pronounced in the high reference point subsample. This indicates that CEOs with connections, especially first-degree connections, are not anchored by the target's reference point and indeed pay lower premiums.

5.4. Method of Payment

Previous findings indicate that acquirers could benefit from social connection, and their resulting higher information advantage, by paying lower premiums to targets. In this section, we further explore whether bidders could exploit this information advantage and the close relationships they have with target firms in other aspects. We investigate whether social

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[16] We also test all models without year and industry effects and find the same results; the results remain robust.

connection would have an effect on the method of payment.

[Insert Table 9 About Here]

In Table 9, we employ logit regressions to address the relation between social connection and medium of payment. The dependent variable is a stock dummy which is equal to one if deals are fully paid with stock. The explanatory variable includes connection (in Model 1 and Model 2), first-degree connection and second-degree connection (in Model 3 and Model 4 respectively). The models also include the other control variables, year fixed effects and industry fixed effects.

In general, all the models show striking relations between the medium of payment and variables representing connection. The coefficients for connection are positive and salient in Model 1 and Model 2, implying that bidders in connected deals are prone to finance bids with their own stock. In Model 4 with fixed effects controlled, stock deals are positively associated with first- and second-degree connections, significant at the 1% level. Moreover, the coefficients for first-degree connection (0.8662 in Model 4) are greater than those for second-degree (0.7159 in Model 4), indicating that a closer connection has a bigger impact on the choice of payment medium. Therefore, acquirers with a first-degree connection tend to choose stock to pay for takeover activities. The findings are consistent with our hypothesis.

Acquirers may choose equity as a payment method due to ownership structure and contingent effects. In stock offers, target shareholders are concerned with overvaluation of acquirers (Martynova & Renneboog, 2009; Travlos, 1987). Bidding firms take longer to negotiate and complete transactions paid with stock (Golubov et al., 2012). Social connection between acquirers and targets, especially first-degree connection, reduces the two-sided information asymmetry, increases trust and enables target shareholders to accurately value bidders' stocks. Therefore, targets are more likely to accept equity payment in socially connected deals. Moreover, target boards or management would accept stock offers in exchange for shares and voting power of combined firms. Connection with acquirers increases the likelihood of retention, therefore leading to a higher probability of acceptance of stock payment.

5.5 Robustness check

5.5.1 Endogeneity test

In this section, we employ the two-stage-least-square (2SLS) procedure to address possible endogeneity problems concerning bid premium. We select instrumental variables (IVs) that relate to the key connection variables but do not directly influence the error component in the models. The objective is to avoid correlation between independent variables and the residuals in OLS regressions. Specifically, the instrument is whether a social connection existed between acquirers and targets three years before the announcement. Since an M&A deal is usually not prepared three years in advance, the connection built three years before does not serve the purpose of acquisition. Therefore, we expect that this instrumental variable has no impact on our dependent variable (acquisition premium), but directly affects the connection variables.

[Insert Table 10 About Here]

We consider connections three years before the announcement as the instrumental variable for connection in previous OLS regressions, first-degree connection three years before for first-degree connection and second-degree connection three years before for second-degree connection. Table 10 shows both the first and second stages of the endogeneity test. Following Politis and Romano (1994), we apply the resampling technique – stationary bootstrap to estimate standard errors and confidence intervals in order to address the potential issue of stationary and weakly dependent observations. The observations are resampled in the block of random length, where the length of each block is distributed with a geometric distribution with mean *b*. We control year and industry fixed effects in all models. In Model 2 and Model 4, we also include target 52-week high. The endogeneity results lead to similar conclusions as in previous sections. We still find a negative impact of social connection, especially first-degree connection, on acquisition premium. The coefficient for first-degree connection is negative and statistically significant at 1%, even with target 52-week high controlled in Model 4. Moreover, we proceed with the Hausman test to further check for the endogeneity when the independent variable is connection (any connection), first-degree connection and second-degree connection. The null hypothesis for the Hausman test is that

the connection variable is exogenous. The p-value of the Hausman test is 0.5401 when connection (any connection) is the regressor, while the p-value is 0.2581 when first-degree connection and second-degree connection are independent variables. Therefore, we cannot reject the null hypothesis that the connection variables are exogenous.

5.5.2 Alternative indicators for reference points

In order to fully compare the impact of social connection with psychological anchoring effect, we also include target peak price over various horizons as alternative indicators for target reference points. Following Baker et al. (2012), we adopt target 13-week high, 26-week high, 39-week high and 104-week high as alternative reference points. Similar to target 52-week high, X-week high is calculated as the log percentage difference of the target's X-week high share price over the share price four weeks before the M&A deal announcement.

[Insert Table 11 About Here]

Table 11 represents the multivariate analysis with alternative reference points. We divide the full sample into three quantiles (low, medium, high) based on various target reference points and then test the relation between connection and premium in the subsample of low/high target reference points. We observe that first-degree connection exerts a strong and negative effect on offer premium in the high quantile of alternative reference points, while no significant relation is found in the low quantile. The findings are consistent with the results with target 52-week high as the reference point (Table 5) and confirm that the negative effect of first-degree connection is more pronounced in the high quantile of reference points. By anchoring high reference points (peak price of target firms), bidders are more likely to pay higher premiums and more likely to deviate from target true value. Acquirers with a first-degree connection have better access to target true value and better bargaining power in the negotiation; therefore, they pay reasonable lower offer prices, especially in deals with higher target reference points. Considering all analyses, the evidence shows that connection plays a determining role in pricing target firms and negotiating premiums.

5.5.3 Propensity score matching

In this section, we employ the propensity score matching (PSM) method to reduce the potential selection bias. Propensity score matching (Rosenbaum & Rubin, 1983) is a statistical method to estimate the treatment effects and reduce bias in non-randomised observational studies.[17] In PSM, the treatment group is matched with the control group, which is not assigned to the certain condition but has similar characteristics and similar values of propensity score as the treatment group. Herein, we adopt propensity score matching (PSM) to evaluate the connection effect in premiums. The treatment group is the sample of connected deals or deals with first-degree connection, while the control group (untreated or comparison group) is the group of deals with no social ties but with similar corporate fundamentals and deal characteristics. Specifically, we adopt Nearest Neighbor (NN) matching as the matching algorithm to obtain the average treatment effect on the treated (ATT) (Imbens, 2004).[18] ATT compares the outcome between treated and untreated units in the matched sample. In this paper, the ATT measures the difference in premiums between connected deals and a comparable non-connected sample which has similar values of propensity score.

[Insert Table 12 About Here]

Table 12 shows the average treatment effect on the treated (ATT) for connected deals and comparison groups. Moreover, we apply the bootstrap method to estimate the standard error and confidence interval. In Panel 1a and Panel 1b, the treatment group is the deals in which acquirers are socially tied with targets. The control group in Panel 1a and Panel 1b is the group of matched non-connected deals with similar firm deal characteristics. The difference between Panel 1a and Panel 1b is whether to include the target reference point in the baseline characteristics. Panel 2a and Panel 2b show the impact of first-degree connection on acquisition premium. Likewise, we consider the target reference point – target 52-week high – as one covariate variable to calculate the propensity score for the control group in Panel 2b. Panel 1a shows the premium in the treatment group is 20.3% less (significant at the 10%

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[17] Treatment effects refer to the effect of a particular condition, such as policy, smoke, education, etc. The treatment group is the group which is assigned the condition.
[18] As a robustness check, we also adopt Stratifying matching and Kernel matching as matching algorithms to compute ATT and find similar results.

level) than the premium in the control group, while the premium difference is insignificant in Panel 1b. In Panel 2a and Panel 2b, ATT is negative and statistically significant at the 1% level. The premium in the treatment group is 15.3%, significantly less than the premium in the comparison group in Panel 2a, while the difference of premium is larger, at 25.3% between the treated and untreated groups in Panel 2b. The findings suggest that first-degree connection exerts a strong and negative influence in premium even after controlling target reference point as a baseline characteristic. The results with propensity score matching further support our previous finding that connection, especially first-degree connection, largely reduces acquisition premiums. The negative effect of first-degree connection is not affected by the psychological reference points.

6. Conclusion

With a US sample from 2001 to 2016, we focus on the influence of cross-firm social connections on acquisition premium during takeover activities. Our findings support the view that bidding firms socially connected to targets pay lower acquisition premiums. The savings in premiums would be larger when the two merging firms share the same board members or executives (that is, a first-degree social connection). To disentangle whether social connections are more related to better information flow or a familiarity bias, we introduce reference point theory (Baker et al., 2012) as an additional testing framework. Acquirers in first-degree connected deals would rely more on information advantages to value the target, rather than the reference point – target 52-week high. Moreover, connected directors who are invited to participate in the new board of the new firm have stronger personal incentives to compromise on low acquisition premiums, at the cost of target shareholders' interest. After reclassifying social connection into CEO connection, we find that bid premiums are largely reduced when either the target or acquirer CEO links the two merging firms. The results indicate that CEO connection is more efficient and valuable than board connection in affecting takeover activities.

Further, favourable acquisition timing and payment method for acquirers could partially explain the negative relation between social connection and acquisition premium. We identify

that acquirers in connected deals tend to take over targets when their own stocks are highly valued and when the recent target price is far less than the target's highest price over the previous year. Therefore, acquirers are prone to finance acquisitions with equity, due to overvalued stocks.

References

Alexandridis, G., Fuller, K. P., Terhaar, L., & Travlos, N. G. (2013). Deal size, acquisition premia and shareholder gains. *Journal of Corporate Finance, 20*, 1-13.

Alexandridis, G., Mavrovitis, C. F., & Travlos, N. G. (2012). How have M&As changed? Evidence from the sixth merger wave. *The European Journal of Finance, 18*(8), 663-688.

Alexandridis, G., Petmezas, D., & Travlos, N. G. (2010). Gains from mergers and acquisitions around the world: New evidence. *Financial Management, 39*(4), 1671-1695.

Ayers, B. C., Lefanowicz, C. E., & Robinson, J. R. (2003). Shareholder taxes in acquisition premiums: The effect of capital gains taxation. *The Journal of Finance, 58*(6), 2783-2801.

Baker, M., Pan, X., & Wurgler, J. (2012). The effect of reference point prices on mergers and acquisitions. *Journal of Financial Economics, 106*(1), 49-71.

Bargeron, L. L., Schlingemann, F. P., Stulz, R. M., & Zutter, C. J. (2008). Why do private acquirers pay so little compared to public acquirers? *Journal of Financial Economics, 89*(3), 375-390.

Baysinger, B., & Hoskisson, R. E. (1990). The composition of boards of directors and strategic control: Effects on corporate strategy. *Academy of Management Review, 15*(1), 72-87.

Bebchuk, L., & Fried, J. (2004). *Pay without performance* (Vol. 29): Cambridge, MA: Harvard University Press.

Bebchuk, L. A., Fried, J. M., & Walker, D. I. (2002). Managerial power and rent extraction in the design of executive compensation: National bureau of economic research.

Betton, S., Eckbo, B. E., Thompson, R., & Thorburn, K. S. (2014). Merger negotiations with stock market feedback. *The Journal of Finance, 69*(4), 1705-1745.

Cai, Y., & Sevilir, M. (2012). Board connections and M&A transactions. *Journal of Financial Economics, 103*(2), 327-349.

Cao, H. H., Han, B., Hirshleifer, D., & Zhang, H. H. (2009). Fear of the unknown: Familiarity and economic decisions. *Review of Finance, 15*(1), 173-206.

Chang, S. (1998). Takeovers of privately held targets, methods of payment, and bidder returns. *The Journal of Finance, 53*(2), 773-784.

Chemmanur, T. J., Paeglis, I., & Simonyan, K. (2009). The medium of exchange in acquisitions: Does the private information of both acquirer and target matter? *Journal of Corporate Finance, 15*(5), 523-542.

Chen, T., Levy, H., Martin, X., & Shalev, R. (2014). Buying Products and Services from Whom You Know: Working Paper, CUNY Baruch College, Washington University in Saint Louis, and New York University.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology., 55*, 591-621.

Cohen, L., Frazzini, A., & Malloy, C. (2008). The small world of investing: Board connections and mutual fund returns. *Journal of Political Economy, 116*(5), 951-979.

Cooney, J. W., Madureira, L., Singh, A. K., & Yang, K. (2015). Social ties and IPO outcomes. *Journal of Corporate Finance, 33*, 129-146.

Daily, C. M., & Schwenk, C. (1996). Chief executive officers, top management teams, and boards of directors: Congruent or countervailing forces? *Journal of Management, 22*(2), 185-208.

Dong, M., Hirshleifer, D., Richardson, S., & Teoh, S. H. (2006). Does investor misvaluation drive the takeover market? *The Journal of Finance, 61*(2), 725-762.

Edmister, R. O., & Walkling, R. A. (1985). Determinants of tender offer premiums.

El-Khatib, R., Fogel, K., & Jandik, T. (2015). CEO network centrality and merger performance. *Journal of Financial Economics, 116*(2), 349-382.

Engelberg, J., Gao, P., & Parsons, C. A. (2012). Friends with money. *Journal of Financial Economics, 103*(1), 169-188.

Finkelstein, S. (1992). Power in top management teams: Dimensions, measurement, and validation. *Academy of Management Journal, 35*(3), 505-538.

Ghosh, A., & Ruland, W. (1998). Managerial ownership, the method of payment for acquisitions, and executive job retention. *The Journal of Finance, 53*(2), 785-798.

Golubov, A., Petmezas, D., & Travlos, N. G. (2012). When it pays to pay your investment banker: New evidence on the role of financial advisors in M&As. *The Journal of Finance, 67*(1), 271-311.

Gorton, G., Kahl, M., & Rosen, R. J. (2009). Eat or be eaten: A theory of mergers and firm size. *The Journal of Finance, 64*(3), 1291-1344.

Harford, J. (2003). Takeover bids and target directors' incentives: The impact of a bid on directors' wealth and board seats. *Journal of Financial Economics, 69*(1), 51-83.

Haunschild, P. R., & Beckman, C. M. (1998). When do interlocks matter?: Alternate sources of information and interlock influence. *Administrative Science Quarterly*, 815-844.

Hillman, A., Nicholson, G., & Shropshire, C. (2006). *DIRECTORS' MULTIPLE ROLE IDENTITIES, IDENTIFICATION AND BOARD MONITORING AND RESOURCE PROVISION.* Paper presented at the Academy of Management Proceedings.

Hochberg, Y. V., Ljungqvist, A., & Lu, Y. (2007). Whom you know matters: Venture capital networks and investment performance. *The Journal of Finance, 62*(1), 251-301.

Holmén, M., Nivorozhkin, E., & Rana, R. (2014). Do anti-takeover devices affect the takeover likelihood or the takeover premium? *The European Journal of Finance, 20*(4), 319-340.

Huang, Y.-S., & Walkling, R. A. (1987). Target abnormal returns associated with acquisition announcements: Payment, acquisition form, and managerial resistance. *Journal of Financial Economics, 19*(2), 329-349.

Ishii, J., & Xuan, Y. (2014). Acquirer-target social ties and merger outcomes. *Journal of Financial Economics, 112*(3), 344-363.

Li, Y., & Aguilera, R. V. (2008). Target director turnover in acquisitions: A conceptual framework. *Corporate Governance: An International Review, 16*(6), 492-503.

Martynova, M., & Renneboog, L. (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.

Mavis, C. P., McNamee, N. P., Petmezas, D., & Travlos, N. G. (2016). Selling to Buy: Asset Sales and Merger Waves.

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics, 73*(2), 201-228.

Mol, M. J. (2001). Creating wealth through working with others: Interorganizational relationships. *The Academy of Management Executive, 15*(1), 150-152.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), 187-221.

Officer, M. S. (2003). Termination fees in mergers and acquisitions. *Journal of Financial Economics, 69*(3), 431-467.

Politis, D. N., & Romano, J. P. (1994). The stationary bootstrap. *Journal of the American Statistical Association, 89*(428), 1303-1313.

Renneboog, L., & Zhao, Y. (2014). Director networks and takeovers. *Journal of Corporate Finance, 28*, 218-234.

Rhodes-Kropf, M., Robinson, D. T., & Viswanathan, S. (2005). Valuation waves and merger activity: The empirical evidence. *Journal of Financial Economics, 77*(3), 561-603.

Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of Business*, 197-216.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41-55.

Rosenstein, J. (1987). Why don't US boards get more involved in strategy? *Long Range Planning, 20*(3), 30-34.

Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly*, 224-253.

Schoorman, F. D., Bazerman, M. H., & Atkin, R. S. (1981). Interlocking directorates: A strategy for reducing environmental uncertainty. *Academy of Management Review, 6*(2), 243-251.

Schwert, G. W. (1996). Markup pricing in mergers and acquisitions. *Journal of Financial Economics, 41*(2), 153-192.

Schwert, G. W. (2000). Hostility in takeovers: in the eyes of the beholder? *The Journal of Finance, 55*(6), 2599-2640.

Shropshire, C. (2010). The role of the interlocking director and board receptivity in the diffusion of practices. *Academy of Management Review, 35*(2), 246-264.

Slovic, P., & Lichtenstein, S. (1971). Comparison of Bayesian and regression approaches to the study of information processing in judgment. *Organizational Behavior and Human Performance, 6*(6), 649-744.

Travlos, N. G. (1987). Corporate takeover bids, methods of payment, and bidding firms' stock returns. *The Journal of Finance, 42*(4), 943-963.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*(4157), 1124-1131.

Uzzi, B. (1999). Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing. *American Sociological Review*, 481-505.

Van Essen, M., Otten, J., & Carberry, E. J. (2015). Assessing managerial power theory: A meta-analytic approach to understanding the determinants of CEO compensation. *Journal of Management, 41*(1), 164-202.

Walkling, R. A., & Edmister, R. O. (1985). Determinants of tender offer premiums. *Financial Analysts Journal, 41*(1), 27-37.

Wang, H., Sakr, S., Ning, Y., & Davidson, W. N. (2010). Board composition after mergers, does it matter to target shareholders? *Journal of Empirical Finance, 17*(5), 837-851.

Wansley, J. W., Lane, W. R., & Yang, H. C. (1983). Abnormal returns to acquired firms by type of acquisition and method of payment. *Financial Management*, 16-22.

Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications* (Vol. 8): Cambridge University Press.

Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management, 15*(2), 291-334.

Figure 1: Histogram of difference between acquisition premium and target reference point

Figure 1 presents the density of offer premium relative to target reference point. Following Baker et al. (2012), we adopt peak price of target firms over different horizons (13 weeks, 26 weeks, 39 weeks, 52 weeks and 104 weeks). X-week high is calculated as the log percentage difference of the target's X-week high share price over the share price four weeks before the M&A deal announcement. The acquisition premium is computed as the log percentage difference between offer price and the target's share price four weeks before the deal announcement. Each histogram plots the density of the difference between premium and target reference point.

Histogram A: Target 13-week high

Histogram B: Target 26-week high

Histogram C: Target 39-week high

Histogram D: Target 52-week high

Histogram E: Target 104-week high
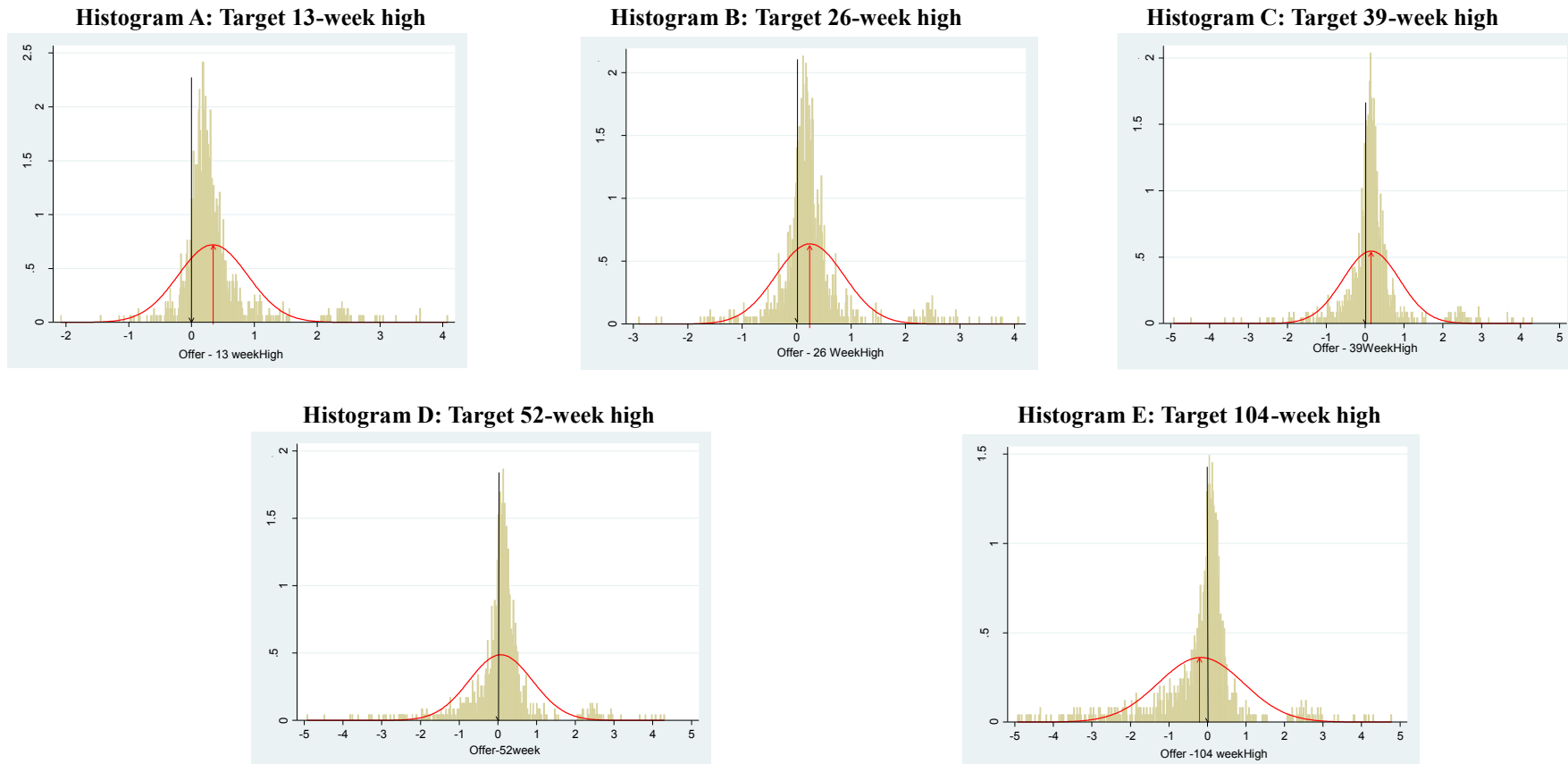
Table 1 – Descriptive Statistics

Table 1 illustrates our complete sample of 1,502 US M&A deals by year and industry of the acquiring company. Industries are classified according to the Fama-French 12-industry categories. Hereby, we classify our sample by the acquirer's SIC code. We consider deals where acquirer and target are quoted US companies. The full sample is displayed first, followed by the classification of connected or non-connected deals. A connected deal can be based on a first- or second-degree connection. A non-connected deal shows no evidence of any social connection. For each classification, we first report the number of deals per year followed by the number of deals per year by the total number of deals. This is done for each classification separately, and the ratio is reported as a percentage.

Panel A: Deals per Year

Year	Full sample		Connected deals		Non-connected deals	
	Number	Percentage	Number	Percentage	Number	Percentage
2001	144	9.59%	14	6.14%	130	10.20%
2002	88	5.86%	11	4.82%	77	6.04%
2003	124	8.26%	13	5.70%	111	8.71%
2004	120	7.99%	8	3.51%	112	8.79%
2005	102	6.79%	12	5.26%	90	7.06%
2006	107	7.12%	9	3.95%	98	7.69%
2007	93	6.19%	16	7.02%	77	6.04%
2008	73	4.86%	10	4.39%	63	4.95%
2009	63	4.19%	13	5.70%	50	3.92%
2010	73	4.86%	9	3.95%	64	5.02%
2011	46	3.06%	8	3.51%	38	2.98%
2012	36	2.40%	3	1.32%	33	2.59%
2013	97	6.46%	27	11.84%	70	5.49%
2014	122	8.12%	23	10.09%	99	7.77%
2015	141	9.39%	34	14.91%	107	8.40%
2016	73	4.86%	18	7.89%	55	4.32%
Total	1502	100.00%	228	100.00%	1274	100.00%

Panel B: Deals per Industry

Fama-French industry classification (12)	Full sample		Connected deals		Non-connected deals	
	Number	Percentage	Number	Percentage	Number	Percentage
Consumer NonDurables	40	2.66%	4	1.75%	36	2.83%
Consumer Durables	14	0.93%	3	1.32%	11	0.86%
Manufacturing	71	4.73%	16	7.02%	55	4.32%
Energy, Oil, Gas and Coal	61	4.06%	16	7.02%	45	3.53%
Chemicals	21	1.40%	6	2.63%	15	1.18%
Business Equipment	361	24.03%	58	25.44%	303	23.78%
Telephone and Television	40	2.66%	5	2.19%	35	2.75%
Utilities	38	2.53%	16	7.02%	22	1.73%
Wholesale and Retail	61	4.06%	9	3.95%	52	4.08%
Healthcare and Med. Equip	180	11.98%	27	11.84%	153	12.01%
Finance	516	34.35%	52	22.81%	464	36.42%
Other	99	6.59%	16	7.02%	83	6.51%
Total	1502	100.00%	228	100.00%	1274	100.00%

Table 2 – Summary statistics

Table 2 reports the summary statistics for our complete sample of 1,502 US M&A transactions between 2001 and 2016. We restrict the M&A deals by the following criteria: We only consider completed M&A deals where both acquirer and target are quoted companies with a deal value of at least $10 million and where the acquirer obtained more than 50% ownership of the target. Furthermore, the data for both the acquirer and target companies need to be available from CRSP and COMPUSTAT. We break down our variables into three panels: Panel A reports acquirer related firm characteristics, Panel B reports target related firm characteristics and Panel C reports common deal related characteristics. First, we present the values for the full sample. Next, we sub-divide our sample based on the presence and degree of social connections. For brevity, we include the CEO when mentioning the board of directors. A connection is present if at least one director from the acquiring firm has a first- or second-degree connection with at least one of the directors from the target firm. A first-degree connection, also known as board interlocks, happens if a director serves simultaneously on the acquirer's and target's boards at the announcement of the M&A deal. A second-degree connection requires a social tie between two directors at the deal announcement of acquirer and target, respectively. This connection may be formed through any historical path, for instance employment, education or social clubs. The remaining deals are defined as non-connected M&A transactions. All denoted variables are specifically defined in Appendix A. Two-tailed t-test is employed to examine the difference of variable in means between connected and non-connected deals. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	Full sample (I)		Connected deals (II)		Unconnected deals (III)		(II) - (III)
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Difference
Panel A: Acquirer related							
Tobin's Q	3.2583	11.5772	4.0544	12.0221	3.1164	11.4960	0.9381**
Market Value ($millions)	19835.39	45473.69	23400.81	46778.20	19213.38	45233.45	4187.44***
Leverage	0.3830	0.2927	0.3983	0.2958	0.3803	0.2922	0.0180
Return on Assets (ROA)	0.0256	0.1571	0.0377	0.1069	0.0235	0.1645	0.0143**
Acquirer run-up	0.0973	0.3524	0.1622	0.3960	0.0888	0.3441	0.0734**
Panel B: Target related							
Tobin's Q	2.7862	9.2032	2.6921	5.9876	2.8033	9.6739	-0.1112*
Market Value ($millions)	1664.18	5069.07	2848.98	6467.88	1454.79	4752.40	1394.20***
Leverage	37.48%	1.1145	36.89%	0.3382	37.59%	1.2009	-0.70%
Return on Assets (ROA)	-0.0890	1.4583	-0.0233	0.2091	-0.1007996	1.5813	7.75%*
Target run-up	0.1036	1.6957	0.0807	0.5147	0.1078	1.8291	-0.0271
Panel C: Deal related							

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Transaction value ($millions)	2,148.43	6,328.85	3,537.58	8,139.58	1,899.04	5,915.28	1638.55***
Premium (%)	39.22%	0.3380	33.68%	0.2910	40.21%	0.3449	-6.53%***
Time to resolution (in days)	130.1262	79.2904	145.2061	101.9994	127.4189	74.2111	17.7872***
52-week high (%)	63.44%	2.2929	46.57%	0.9865	66.42%	2.4516	-19.85%
Relative deal size	0.3333	0.4692	0.4153	0.6166	0.3213	0.4373	0.0940***
Hostile takeover	1.07%	0.0107	0.88%	0.0935	1.10%	0.1045	-0.23%
Competing bid	4.14%	0.1993	4.39%	0.2052	4.09%	0.1982	0.29%
Pure cash deal	39.45%	0.4889	35.09%	0.4783	40.24%	0.4906	-5.15%
Pure stock deal	24.49%	0.4302	31.58%	0.4659	23.20%	0.4223	8.38%***
Diversification	29.37%	0.4556	27.19%	0.4459	29.76%	0.4574	-2.57%
Tender offer	17.82%	0.3828	18.86%	0.3920	17.64%	0.3813	1.22%
Number of observations		1502		228		1274	

Table 3 – Correlation matrix

Table 3 reports the correlation matrix and shows the Pearson correlation coefficients for each pair of variables in this study. All denoted variables are specifically defined in Appendix A. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Correlation Matrix	Premium	First-degree Connection	Second-degree Connection	First-degree CEO Connection	Second-degree CEO Connection	First-degree Board Connection	Second-degree Board Connection	Target 52-week high
First-Degree Connection	-0.0947***							
Second-Degree Connection	-0.0146	-0.0799***						
First-degree CEO Connection	-0.0916***	0.7511***	-0.0386					
Second-degree CEO Connection	-0.0504*	0.0698***	0.4907***	-0.0354				
First-degree Board Connection	-0.0440*	0.7396***	-0.0480*	0.3302***	0.1137***			
Second-degree Board Connection	0.0128	-0.012	0.8235***	0.0157	0.0468*	-0.0522**		
Target 52-week high	0.1190***	0.0069	-0.0488*	-0.001	-0.0228	0.0104	-0.0331	
Acquirer Tobin's Q	0.0231	-0.0034	0.0245	-0.0031	-0.0081	-0.0066	0.0304	0.0145
Target Tobin's Q	-0.0234	0.0108	-0.0092	0.0012	0.0029	0.0128	-0.0082	0.0186
Transaction Value	-0.1433***	-0.0161	0.2295***	-0.0232	0.1379***	-0.0079	0.1861***	-0.1546***
Relative Deal Size	-0.1493***	-0.0009	0.0906***	0.0001	0.0518*	0.0112	0.0634**	0.006
Pure Cash Deal	0.1590***	-0.0283	-0.0462*	-0.0292	-0.0694***	-0.0287	-0.0219	-0.0483
Pure Stock Deal	-0.1122***	0.0796***	0.0278	0.0927***	0.1103***	0.0529**	-0.0026	0.1024***
Hostile	0.0521*	0.0114	-0.0211	-0.017	0.0089	0.0261	-0.0128	0.0231
Tender	0.1523***	0.0188	0.0003	0.0005	-0.0333	0.0294	0.0259	0.0647**
Competing Bid	0.0566**	-0.0089	0.0088	-0.0129	0.0037	-0.0107	0.0093	0.0147
Diversification	0.0076	0.0154	-0.0329	0.0326	-0.0261	0.0136	-0.0135	-0.0254

Correlation Matrix	Acquirer Tobin's Q	Acquirer Run-up	Target Tobin's Q	Transaction Value	Relative Deal Size	Pure Cash Deal	Pure Stock Deal	Hostile	Tender	Competing Bid
Target Tobin's Q	0.0376	-0.0063								
Transaction Value	0.0578**	0.0464	0.1016***							
Relative Deal Size	-0.0183	0.0170	-0.0202	0.2478***						
Pure Cash Deal	0.0356	-0.0863***	0.0287	-0.0698***	-0.2967***					
Pure Stock Deal	0.0011	0.0814***	-0.0217	-0.0998***	0.0992***	-0.4597***				
Hostile	-0.0076	-0.0174	-0.0278	-0.0013	0.0131	0.0011	-0.0263			
Tender	0.03	-0.0222	0.0193	0.0112	-0.1441***	0.3560***	-0.2060***	0.1722***		
Competing Bid	-0.0209	0.0254	0.0007	0.1068***	0.0511*	0.0383	-0.0564*	0.1088***	0.1309***	
Diversification	-0.0119	0.0041	-0.0186	0.0369	-0.0647**	0.1636***	-0.0805***	0.0043	0.0405	-0.0089

Table 4 – Acquisition Premium Analysis and Reference Point

Table 4 compares the impact of social connections and reference point hypothesis on acquisition premiums. Depending on the degree of our calculated 52-week high variables, we divide our sample into three quantiles (low, medium, high). Next, we present the values for the full sample and sub-divide our sample based on the presence and degree of social connections. The acquisition premium is computed as the log percentage difference between offer price and the target's share price four weeks before the deal announcement. According to Baker et al. (2012), target 52-week high is computed as the log percentage difference between the 52-week high share price and the target's share price four weeks before the deal announcement. A connection is present if the acquirer's directors form a first- or second-degree social connection with the target's directors. A first-degree connection, also known as board interlocks, is considered if a director simultaneously serves on the acquirer's and target's boards at the announcement of the M&A deal. A second-degree connection requires a social tie between two directors from both target and acquiring firms at the deal announcement, respectively. The remaining deals are defined as non-connected M&A transactions. Two-tailed t-test is employed to examine the difference of premium between pair-wise groups. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Premium	Full Sample	Connected deals	First-degree connected	Second-degree connected	Non-connected deals	Difference			
	(1)	(2)	(3)	(4)	(5)	(2) - (5)	(3) - (5)	(4) - (5)	(3) - (4)
52-Week high									
Low	30.16%	27.66%	15.40%	30.61%	30.60%	-2.94%	-15.20%***	0.01%	-15.21%**
Medium	35.19%	28.90%	25.80%	30.31%	36.29%	-7.39%**	-10.49%***	-5.98%	-4.51%*
High	51.49%	42.49%	36.85%	46.44%	53.10%	-10.61%**	-16.25%***	-6.66%	-9.59%*
Observations	1502	228	66	162	1274				

Table 5 – Determinants of the acquisition premium

Table 5 reports the multivariate analysis for acquisition premium. In all models, acquisition premium is regressed against a dummy variable indicating whether the acquirer and target firms are socially connected. The acquisition premium is computed as the log percentage difference between offer price and the target's share price four weeks before the deal announcement. Further, we differentiate between first- and second-degree connections. The independent variable in Model 1 and Model 4 is Connection, which is equal to one if acquirers are socially connected with targets. The independent variable in Model 3 is target 52-week high, log percentage difference of the target's 52-week high share price to evaluate the anchoring effect. The independent variables in Model 2 and Model 5 are first-degree connection and second-degree connection. A first-degree connection happens if a director simultaneously serves on the acquirer's and target's boards at the announcement of the M&A deal. A second-degree connection requires a social tie between a director from the acquirer's board and a director from the target's board. This connection may be formed through any historical path, for instance employment, education or social clubs. Furthermore, we use the log percentage difference of the target's 52-week high share price from Baker et al. (2012) in Model 4 and Model 5. In addition, we control for different acquirer, target and deal-related characteristics. In all models, we control for industry and year fixed effects. For brevity, we do not report the results for the industry and year dummies. All models contain the same control variables defined in Appendix A. Robust t-statistics are reported in brackets. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Acquisition Premium	Model 1	Model 2	Model 3	Model 4	Model 5
Connection	-0.2724***			-0.2691***	
	(-2.67)			(-2.64)	
First-degree connection		-0.4072***			-0.4045***
		(-2.72)			(-2.64)
Second-degree connection		0.0213			0.0227
		(0.29)			(0.29)
Target 52-week high			0.0386***	0.0145	0.0212
			(3.19)	(1.01)	(1.30)
Acquirer Tobin's Q	-0.0007	0.0007	-0.0004	-0.0007	-0.0001
	(-0.29)	(0.58)	(-0.28)	(-0.30)	(-0.06)
Target Tobin's Q	-0.0044	-0.0035***	-0.0033	-0.0043	-0.0034**
	(-1.39)	(-2.64)	(-1.24)	(-1.36)	(-2.45)
Relative deal size	-0.1659*	-0.1386**	-0.1564**	-0.1663*	-0.1516**
	(-1.91)	(-2.25)	(-2.50)	(-1.92)	(-2.38)
Pure cash deal	0.0683	0.1495**	0.1280**	0.0757	0.1551**
	(0.86)	(2.42)	(2.00)	(0.94)	(2.48)
Hostile takeover	-0.7180	0.4038	0.4475*	-0.7059	0.4285
	(-1.41)	(1.43)	(1.69)	(-1.37)	(1.63)
Tender offer	-0.0060	0.0734	0.0976	-0.0027	0.0661
	(-0.06)	(1.03)	(1.24)	(-0.03)	(0.90)
Competing bid	0.0160	0.1297	0.1037	0.0113	0.1136
	(0.10)	(0.99)	(0.85)	(0.07)	(0.85)
Diversification	-0.0355	-0.0204	-0.0291	-0.0327	-0.0152
	(-0.48)	(-0.36)	(-0.48)	(-0.44)	(-0.26)
Constant	-0.8775***	-1.0568***	-1.2695***	-0.9091***	-1.0876***

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	(-3.86)	(-10.40)	(-8.95)	(-3.96)	(-10.23)
Year-fixed-effects	Yes	Yes	Yes	Yes	Yes
Industry-fixed-effects	Yes	Yes	Yes	Yes	Yes
Observations	1502	1502	1502	1502	1502
Adjusted R2	0.085	0.089	0.068	0.085	0.087

Table 6 – Acquisition premium analysis in subsamples of low/high target 52-week high

Table 6 reports the multivariate analysis for acquisition premium in subsamples of low/high target 52-week high. Target 52-week high is the target's 52-week high share price, computed as log percentage difference of the target's share price four weeks before the M&A deal announcement. The full sample is split into three groups based on the target 52-week high. The low group in Model 1 and Model 3 refers to the subsample in which the deals have the lowest target 52-week high, while the high group in Model 2 and Model 4 is the subsample in which the deals have the highest target 52-week high. In all models, acquisition premium is regressed against a dummy variable indicating if the acquirer and target firms are socially connected. The acquisition premium is computed as the log percentage difference between offer price and the target's share price four weeks before the deal announcement. Further, we differentiate between first- and second-degree connections. The independent variable in Model 1 and Model 2 is Connection, which is equal to one if acquirers are socially connected with targets. The dependent variables in Model 3 and Model 4 are first-degree connection and second-degree connection. A first-degree connection happens if a director simultaneously serves on the acquirer's and target's boards at the announcement of the M&A deal. A second-degree connection requires a social tie between a director from the acquirer's board and a director from the target's board. This connection may be formed through any historical path, for instance employment, education or social clubs. In addition, we control for different acquirer, target and deal-related characteristics. In all models, we control for industry and year fixed effects. For brevity, we do not report the results for the industry and year dummies. All models contain the same control variables defined in Appendix A. Robust t-statistics are reported in brackets. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Acquisition premium	Low Model 1	High Model 2	Low Model 3	High Model 4
Connection	0.0521	-0.1958**		
	(0.50)	(-2.14)		
First-degree connection			-0.5089	-0.3937***
			(-1.36)	(-3.31)
Second-degree connection			0.1676	-0.0594
			(1.55)	(-0.50)
Acquirer Tobin's Q	0.0064	-0.0016*	0.0056	-0.0017*
	(1.03)	(-1.74)	(0.91)	(-1.85)
Target Tobin's Q	-0.0013	-0.0058***	-0.0013	-0.0053***
	(-1.03)	(-2.85)	(-1.05)	(-2.67)
Relative deal size	-0.1918**	-0.0864	-0.2062**	-0.0992
	(-2.13)	(-0.95)	(-2.30)	(-1.12)
Pure cash deal	0.1178	0.1493*	0.1338	0.1523*
	(1.14)	(1.79)	(1.34)	(1.84)
Hostile takeover	0.5269	0.3415*	0.5358	0.3542*
	(1.43)	(1.74)	(1.49)	(1.78)
Tender offer	-0.0566	0.1132	-0.0684	0.1148
	(-0.46)	(1.25)	(-0.57)	(1.26)
Competing bid	0.2631	-0.0490	0.2967*	-0.0563
	(1.53)	(-0.26)	(1.71)	(-0.30)
Diversification	-0.0210	-0.0601	-0.0227	-0.0634
	(-0.24)	(-0.76)	(-0.26)	(-0.80)
Constant	-0.8192***	-0.5186**	-0.8404***	-0.5242***

	(-3.58)	(-2.49)	(-3.68)	(-2.59)
Year-fixed-effects	yes	yes	Yes	yes
Industry-fixed-effects	yes	yes	Yes	yes
Observations	751	751	751	751
Adjusted R2	0.054	0.075	0.067	0.078

Table 7 – Explain low premium for connected deals

Table 7 explores why acquisition premium is associated with social connection using three panels. Panel A shows univariate analysis for low premium in the connected deals, first-degree connected deals and second-degree connected deals, which are further classified by directors' position on the board of acquisition partners. We divide board position into first-level (CEO; Chairman) and second-level (common director; independent director). A_higher position refers to interlocking directors with a higher position in the acquirer board than the target board. A_same level position is where an interlocking director is CEO/Chairman of both acquirer and target, or is hired as a common director or independent director of the acquisition partner. T_higher position indicates that an interlocking director has a higher position (CEO/Chairman) in the acquirer than the target. Panel B limits the sample to second-degree connected deals. In Panel B, we classify the sample by whether a target director is retained on the board of the combined firm after acquisition. Panel C lists multivariate analysis for low premium. Model 1 and Model 2 report regressions for deals with a connection. Model 3 and Model 4 show the results of first-degree connection. The dependent variables in all the models are acquisition premium, computed as the log percentage difference between offer price and the target's share price four weeks before the deal announcement. A_higher position is a dummy variable which equals one when interlocking directors have a higher board position in the acquirer than the target, and zero otherwise. A_same position is a dummy variable which equals one when an interlocking director has the same level position in the acquirer as in the target, and zero otherwise. In Model 5 and Model 6, the independent variable is T_retain, a dummy variable which equals one when a target director is offered a board seat on the board of the combined firm. Model 2, Model 4 and Model 6 control both year and industry fixed-effects. For brevity, we do not report the results for the industry and year dummies. All models contain the same control variables defined in Appendix A. Two-tailed t-test is employed to examine the difference of premium between pair-wise groups in Panel A and Panel B. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A: Univariate Analysis of Premium for Seniority

	Connected deal	A_higher position	A_T same level	T_higher position	Difference		
	(1)	(2)	(3)	(4)	(2) - (4)	(3) - (4)	(2) - (3)
Premium	33.68%	27.88%	34.78%	39.36%	-11.48%**	-4.58%*	-6.90%
Observations	228	34	142	52			
	First-degree connected	A_higher position	A_T same level	T_higher position	Difference		
	(1)	(2)	(3)	(4)	(2) - (4)	(3) - (4)	(2) - (3)
Premium	28.88%	13.17%	28.20%	46.94%	-19.06%***	-6.18%**	-15.04%**
Observations	66	22	32	12			
	Second-degree connected	A_higher position	A_T same level	T_higher position	Difference		
	(1)	(2)	(3)	(4)	(2) - (4)	(3) - (4)	(2) - (3)
Premium	35.64%	29.36%	37.29%	35.91%	-6.54%	-1.39%	-6.54%
Observations	162	12	110	40			

Panel B: Univariate analysis of Premium for retention

	Connected deal	Retain	Non-retain	Difference
	(1)	(2)	(3)	(2) - (3)
premium	33.68%	30.12%	40.07%	-9.95%***
Observations	228	120	108	
	Second-degree connected	Retain	Non-retain	Difference
	(1)	(2)	(3)	(2) - (3)
premium	35.64%	31.46%	37.73%	-6.26%**
Observations	162	54	108	

Panel C: Multivariate analysis of Premium for seniority and retention

Acquisition Premium	Connected		First-degree Connected		Connected	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
A_higher position	-0.1674***	-0.1678***	-0.3060***	-0.4775***		
	(-3.29)	(-2.97)	(-3.68)	(-3.74)		
A_T same level position	-0.0528*	-0.0508	-0.1233*	-0.3695***		
	(-1.67)	(-1.61)	(-1.77)	(-3.22)		
T_Retain					-0.1040***	-0.0959***
					(-3.38)	(-2.99)
Target 52-week high	0.0185***	0.0114	0.0246	0.0003	0.0180***	0.0106
	(2.65)	(1.61)	(0.63)	(0.00)	(2.58)	(1.50)
Acquirer Tobin's Q	-0.0001	-0.0001	0.0132	0.0500**	-0.0000	0.0000
	(-0.32)	(-0.20)	(1.51)	(2.89)	(-0.00)	(0.01)
Target Tobin's Q	-0.0021**	-0.0026***	0.0006	-0.0235**	-0.0024**	-0.0029***
	(-2.04)	(-2.66)	(0.09)	(-2.24)	(-2.29)	(-3.03)
Relative deal size	-0.0530***	-0.0608***	-0.3180***	-0.4711**	-0.0517**	-0.0608***
	(-2.66)	(-2.77)	(-3.01)	(-2.95)	(-2.41)	(-2.60)
Pure cash deal	0.0853***	0.0729***	-0.1019*	-0.1426	0.0845***	0.0743***
	(3.79)	(2.98)	(-1.74)	(-1.75)	(3.72)	(3.04)
Hostile takeover	0.0330	0.0393	0.1756	0.1928	0.0439	0.0474
	(0.31)	(0.36)	(1.03)	(0.77)	(0.42)	(0.44)
Tender offer	0.1096***	0.0517	0.2555***	0.1872*	0.1035***	0.0448
	(3.46)	(1.63)	(3.62)	(1.95)	(3.29)	(1.42)
Competing bid	0.1237**	0.1271**	0.1810	0.3978**	0.1237**	0.1264**
	(2.24)	(2.23)	(1.67)	(2.46)	(2.24)	(2.22)
Diversification	-0.0238	-0.0198	-0.1044*	-0.0783	-0.0242	-0.0218
	(-1.12)	(-0.91)	(-1.85)	(-1.05)	(-1.13)	(-1.00)
Constant	0.3666***	0.5532***	0.4198***	0.0355	0.3671***	0.5570***
	(20.63)	(7.80)	(5.49)	(0.12)	(20.26)	(7.94)
Year-fixed-effects	No	Yes	No	Yes	No	Yes
Industry-fixed-effects	No	Yes	No	Yes	No	Yes
Observations	228	228	66	66	228	228
Adjusted R2	0.080	0.120	0.361	0.466	0.080	0.123

Table 8 - Determinants of acquisition premium in CEO connections

In Table 8, we analyse the acquisition premium by adopting an alternative proxy – CEO connection. In all models, acquisition premium is regressed against a dummy variable indicating if the acquirer and target firms are socially connected. The acquisition premium is computed as the log percentage difference between the offer price and the target's share price four weeks before the deal announcement. The independent variable in Model 1, Model 2 and Model 5 is CEO Connection, which is equal to one if either the acquirer or target CEO connects the two merging firms. The dependent variables in Model 3, Model 4 and Model 6 are CEO first-degree connection and CEO second-degree connection. CEO first-degree connection is defined as when acquirer CEOs also work as target board members (acquirer board member) or executives. CEO second-degree connection happens when acquirer or target CEOs share past experience with board members or executives in the counterpart firm. Furthermore, we use the log percentage difference of the target's 52-week high share price from Baker et al. (2012) in Model 2 and Model 4. In addition, we control for different acquirer, target and deal-related characteristics. In all models, we control for industry and year fixed effects. In Model 5 and Model 6, we split the full sample into three groups (low, medium, high) based on the target 52-week high and show the multivariate analysis of premiums in the low/high target 52-week high subsample. For brevity, we do not report the results for the industry and year dummies. All models contain the same control variables defined in Appendix A. Robust t-statistics are reported in brackets. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Acquisition Premium	Model 1	Model 2	Model 3	Model 4	Model 5 Low	Model 5 High	Model 6 Low	Model 6 High
CEO Connection	-0.2891**	-0.3117**			-0.1400	-0.4563***		
	(-2.50)	(-2.56)			(-0.59)	(-3.66)		
First-degree CEO connection			-0.5075**	-0.5704***			-0.8295	-0.5370***
			(-2.39)	(-2.60)			(-1.64)	(-3.26)
Second-degree CEO connection			-0.1266	-0.1317			0.2476	-0.3992**
			(-1.10)	(-1.11)			(1.48)	(-2.24)
Target 52-week high		0.0197		0.0210				
		(1.22)		(1.29)				
Acquirer Tobin's Q	0.0004	-0.0003	0.0005	-0.0001	0.0057	-0.0017*	0.0071	-0.0017*
	(0.40)	(-0.33)	(0.45)	(-0.07)	(0.93)	(-1.94)	(1.15)	(-1.91)
Target Tobin's Q	-0.0037***	-0.0035**	-0.0036***	-0.0034**	-0.0012	-0.0051***	-0.0012	-0.0051***

	(-2.67)	(-2.47)	(-2.68)	(-2.42)	(-0.99)	(-2.65)	(-0.97)	(-2.62)
Relative deal size	-0.1463**	-0.1580**	-0.1489**	-0.1514**	-0.1925**	-0.0940	-0.1912**	-0.0930
	(-2.32)	(-2.44)	(-2.35)	(-2.38)	(-2.13)	(-1.15)	(-2.10)	(-1.10)
Pure cash deal	0.1326**	0.1369**	0.1329**	0.1519**	0.1120	0.1541*	0.1334	0.1640**
	(2.15)	(2.19)	(2.16)	(2.44)	(1.08)	(1.91)	(1.35)	(2.01)
Hostile takeover	0.4067**	0.4309**	0.3906**	0.3999**	0.5213	0.3549*	0.4721	0.3274*
	(2.26)	(2.45)	(2.18)	(2.52)	(1.29)	(1.80)	(1.34)	(1.67)
Tender offer	0.0528	0.0466	0.0577	0.0686	-0.0675	0.1173	-0.0263	0.1317
	(0.75)	(0.63)	(0.81)	(0.94)	(-0.57)	(1.24)	(-0.22)	(1.45)
Competing bid	0.1162	0.0997	0.1206	0.1162	0.2703	-0.0464	0.3573**	-0.0632
	(0.89)	(0.75)	(0.92)	(0.87)	(1.57)	(-0.25)	(1.98)	(-0.34)
Diversification	-0.0182	-0.0152	-0.0185	-0.0151	-0.0210	-0.0591	-0.0180	-0.0635
	(-0.29)	(-0.23)	(-0.29)	(-0.26)	(-0.23)	(-0.70)	(-0.21)	(-0.80)
Constant	-0.6736***	-0.7101***	-0.6793***	-1.0902***	-0.8130***	-0.5437***	-1.1661***	-0.9619***
	(-4.54)	(-4.62)	(-4.58)	(-10.30)	(-3.45)	(-2.71)	(-7.18)	(-6.84)
Year-fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1502	1502	1502	1502	751	751	751	751
Adjusted R2	0.093	0.092	0.095	0.090	0.055	0.086	0.072	0.080

Table 9 – Method of Payment

Table 9 reports the logit regression on the method of payment. The dependent variable in all models is the Stock dummy, which is equal to one if the takeover transaction is fully financed with stock. The independent variable in Model 1 and Model 2 is Connection, which is equal to one if acquirers are socially connected with targets. The dependent variable in Model 3 and Model 4 is first-degree connection and second-degree connection. A first-degree connection happens if a director simultaneously serves on the acquirer's and target's boards at the announcement of the M&A deal. A second-degree connection requires a social tie between a director from the acquirer's board and a director from the target's board. This connection may be formed through any historical path, for instance employment, education or social clubs. Further, we control for different acquirer and deal-related characteristics, as well as for industry and year fixed effects in Model 2 and Model 4. For brevity, we do not report the results for the industry and year dummies. All models contain the same control variables defined in Appendix A. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Stock as payment method	Model 1	Model 2	Model 3	Model 4
Connection	0.6800***	0.7955***		
	(3.55)	(3.90)		
First-degree connection			0.8667***	0.8662***
			(2.79)	(2.77)
Second-degree connection			0.5829**	0.7159***
			(2.50)	(2.87)
Target 52-week high	0.0900*	0.1160*	0.0894*	0.1047*
	(1.71)	(1.82)	(1.71)	(1.69)
Acquirer stock run-up	0.5428***	0.5018***	0.5371***	0.4179**
	(2.88)	(2.61)	(2.82)	(2.13)
Acquirer firm size	-0.2479***	-0.2103***	-0.2449***	-0.2100***
	(-5.76)	(-4.57)	(-5.70)	(-4.56)
Relative deal size	-0.0674	0.0291	-0.0565	-0.0038
	(-0.49)	(0.20)	(-0.41)	(-0.02)
Hostile takeover	0.4920	0.3960	0.4766	0.3295
	(0.57)	(0.47)	(0.56)	(0.39)
Tender offer	-1.7878***	-1.5877***	-1.7903***	-1.6023***
	(-5.84)	(-5.18)	(-5.84)	(-5.25)
Competing bid	-0.4711	-0.4259	-0.4800	-0.4758
	(-1.10)	(-0.97)	(-1.12)	(-1.10)
Diversification	-0.2404	-0.1664	-0.2423	-0.1235
	(-1.47)	(-0.99)	(-1.48)	(-0.73)
Constant	0.8776**	-0.1185	0.8538**	0.0301
	(2.47)	(-0.12)	(2.40)	(0.03)
Year-fixed-effects	No	Yes	No	Yes
Industry-fixed-effects	No	Yes	No	Yes
Observations	1502	1502	1502	1502
Pseudo R2	0.107	0.136	0.107	0.142

Table 10 –Endogeneity test

Table 10 reports the endogeneity test – two stages least square (2sls) – for acquisition premium analysis. The instrument variable for social connection is previous social connection, which refers to a situation where acquirers and targets are socially connected three years before the takeover announcement. Similarly, the instrument variable for first-degree connection is previous first-degree connection, which describes whether a director simultaneously served on the acquirer's and target's boards three years before the announcement of the M&A deal. The instrument variable for second-degree connection is previous second-degree connection, which describes whether two individual board members, respectively from the acquirer and target, had social ties three years before the deal announcement. This connection may be formed through any historical path, for instance employment, education or social clubs. In all models, acquisition premium is regressed against a dummy variable indicating if the acquirer and target firms are socially connected. The acquisition premium is computed as the log percentage difference between offer price and the target's share price four weeks before the deal announcement. Furthermore, we use the percentage difference of the target's 52-week high share price from Baker et al. (2012) as a measure of potential overpayment. In addition, we control for different acquirer, target and deal-related characteristics. In all models, we control for industry and year fixed effects. For brevity, we do not report the results for the industry and year dummies. All models contain the same control variables defined in Appendix A. Robust t-statistics are reported in brackets. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Acquisition Premium	Model 1		Model 2		Model 3			Model 4		
	First-stage:	Second-stage	First-stage:	Second-stage	First-stage:		Second-stage	First-stage:		Second-stage
	Connection		Connection		First-degree Connection	Second-degree Connection		First-degree Connection	Second-degree Connection	
Connection		-0.1648*		-0.1693*						
		(-1.72)		(-1.79)						
First-degree connection							-0.4502**			-0.4525**
							(-2.14)			(-2.42)
Second-degree connection							-0.0268			-0.0222
							(-0.27)			(-0.20)
Target 52-week high			-0.0019	0.0192				0.0002	-0.0033**	0.0203
			(-1.36)	(1.12)				(0.31)	(-2.44)	(1.21)
Acquirer Tobin's Q	-0.0001	0.0006	-0.0003*	-0.0001	0.0001	0.0000	0.0005	0.0001	0.0000	-0.0002
	(-0.26)	(0.43)	(-1.68)	(-0.07)	(0.92)	(-0.07)	(0.28)	(0.85)	(-0.22)	(-0.06)
Target Tobin's Q	0.0000	-0.0038	0.0000	-0.0036	0.0001	-0.0004	-0.0035*	0.0001	-0.0004	-0.0034*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	(0.20)	(-1.36)	(0.09)	(-1.29)	(0.68)	(-0.94)	(-1.92)	(0.65)	(-0.95)	(-1.72)
Relative deal size	0.0373	-0.1406*	0.0215	-0.1510**	-0.0052	0.0441*	-0.1486*	-0.0066	0.0449*	-0.1615***
	(1.41)	(-1.82)	(1.04)	(-2.12)	(-0.85)	(1.69)	(-1.85)	(-1.05)	(1.74)	(-2.83)
Pure cash deal	-0.0133	0.1273**	-0.0183	0.1313**	-0.0115	-0.0049	0.1324**	-0.0122	-0.0063	0.1378**
	(-0.80)	(2.22)	(-0.97)	(2.30)	(-1.46)	(-0.29)	(2.12)	(-1.49)	(-0.37)	(2.28)
Hostile takeover	0.0372	0.3982**	0.0276	0.4204**	0.0622	-0.0269	0.4196**	0.0624	-0.0338	0.4439**
	(0.37)	(2.21)	(0.24)	(2.51)	(0.66)	(-0.85)	(2.12)	(0.65)	(-1.03)	(2.54)
Tender offer	0.0200	0.0611	0.0290	0.0550	0.0089	0.0146	0.0595	0.0091	0.0246	0.0522
	(0.84)	(0.86)	(1.01)	(0.93)	(0.60)	(0.57)	(0.85)	(0.60)	(0.95)	(0.82)
Competing bid	-0.0185	0.1131	-0.0327	0.0972	0.0187	-0.0327	0.1186	0.0177	-0.0321	0.1024
	(-0.70)	(0.92)	(-1.09)	(0.76)	(0.73)	(-1.21)	(0.89)	(0.68)	(-1.17)	(0.86)
Diversification	0.0145	-0.0199	0.0152	-0.0153	0.0094	-0.0008	-0.0219	0.0098	0.0007	-0.0167
	(0.87)	(-0.49)	(0.83)	(-0.28)	(1.05)	(-0.05)	(-0.34)	(1.04)	(0.04)	(-0.36)
Previous Connection (IV)	0.9319***		0.9329***							
	(77.07)		(62.50)							
Previous First-degree connection (IV)					0.9662***	-0.4137***		0.9625***	-0.4179***	
					(77.82)	(-5.66)		(68.76)	(-5.58)	
Previous Second-degree connection (IV)					0.0401	0.8052***		0.0438	0.7959***	
					(1.61)	(24.07)		(1.61)	(24.07)	
Constant	-0.0345	-0.6653***	-0.0022	-0.7011***	-0.0138	-0.0149	-0.6749***	-0.0001	0.0059	-0.7133***
	(-1.48)	(-5.11)	(-0.1)	(-4.62)	(-1.17)	(-0.57)	(-5.45)	(-0.01)	(0.29)	(-4.48)
Year-fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1502	1502	1502	1502	1502	1502	1502	1502	1502	1502
Adjusted R2	0.655	0.087	0.6289	0.085	0.6433	0.5545	0.094	0.6354	0.5438	0.092

Table 11 – Alternative target reference points

Table 11 reports the premium analysis with social connection and alternative target reference points. In Panel A, the acquisition premium is regressed against a dummy variable indicating if the acquirer and target firms are socially connected. The independent variable in Model 1, Model 2, Model 3 and Model 4 is first-degree connection. Furthermore, we use the log percentage difference of the target's X-week high share price from Baker et al. (2012) in all models. Panel B shows the multivariate regressions in the subsample of low/high target reference point. Target's X-week high is computed as the log percentage difference between target peak price achieved during the past X weeks and target price four weeks before the deal announcement. The models include target 13-week high, target 26-week high, target 39-week high and target 104-week high as the target reference point in Model 1, Model 2, Model 3 and Model 4, respectively. The acquisition premium is computed as the log percentage difference between the offer price and the target's share price four weeks before the deal announcement. A first-degree connection happens if a director simultaneously serves on the acquirer's and target's boards at the announcement of the M&A deal. In addition, we control for different acquirer, target and deal-related characteristics, as well as for industry and year fixed effects. All models contain the same control variables defined in Appendix A. Robust t-statistics are reported in brackets. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Premium analysis in the subsamples of low/high target reference points

Acquisition Premium	Model 1 13-week high reference point		Model 2 26-week high reference point		Model 3 39-week high reference point		Model 4 104-week high reference point	
	Low	High	Low	High	Low	High	Low	High
First-degree connection	-0.5089	-0.3937***	-0.5089	-0.3937***	-0.5089	-0.3937***	-0.5089	-0.3937***
	(-1.36)	(-3.31)	(-1.36)	(-3.31)	(-1.36)	(-3.31)	(-1.36)	(-3.31)
Second-degree connection	0.1676	-0.0594	0.1676	-0.0594	0.1676	-0.0594	0.1676	-0.0594
	(1.55)	(-0.50)	(1.55)	(-0.50)	(1.55)	(-0.50)	(1.55)	(-0.50)
Acquirer Tobin's Q	0.0056	-0.0017*	0.0056	-0.0017*	0.0056	-0.0017*	0.0056	-0.0017*
	(0.91)	(-1.85)	(0.91)	(-1.85)	(0.91)	(-1.85)	(0.91)	(-1.85)
Target Tobin's Q	-0.0013	-0.0053***	-0.0013	-0.0053***	-0.0013	-0.0053***	-0.0013	-0.0053***
	(-1.05)	(-2.67)	(-1.05)	(-2.67)	(-1.05)	(-2.67)	(-1.05)	(-2.67)
Relative deal size	-0.2062**	-0.0992	-0.2062**	-0.0992	-0.2062**	-0.0992	-0.2062**	-0.0992
	(-2.30)	(-1.12)	(-2.30)	(-1.12)	(-2.30)	(-1.12)	(-2.30)	(-1.12)
Pure stock deal	0.1338	0.1523*	0.1338	0.1523*	0.1338	0.1523*	0.1338	0.1523*
	(1.34)	(1.84)	(1.34)	(1.84)	(1.34)	(1.84)	(1.34)	(1.84)
Hostile takeover	0.5358	0.3542*	0.5358	0.3542*	0.5358	0.3542*	0.5358	0.3542*

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	(1.49)	(1.78)	(1.49)	(1.78)	(1.49)	(1.78)	(1.49)	(1.78)
Tender offer	-0.0684	0.1148	-0.0684	0.1148	-0.0684	0.1148	-0.0684	0.1148
	(-0.57)	(1.26)	(-0.57)	(1.26)	(-0.57)	(1.26)	(-0.57)	(1.26)
Competing bid	0.2967*	-0.0563	0.2967*	-0.0563	0.2967*	-0.0563	0.2967*	-0.0563
	(1.71)	(-0.30)	(1.71)	(-0.30)	(1.71)	(-0.30)	(1.71)	(-0.30)
Diversification	-0.0227	-0.0634	-0.0227	-0.0634	-0.0227	-0.0634	-0.0227	-0.0634
	(-0.26)	(-0.80)	(-0.26)	(-0.80)	(-0.26)	(-0.80)	(-0.26)	(-0.80)
Constant	-0.8404***	-0.5242***	-0.8404***	-0.5242***	-0.8404***	-0.5242***	-0.8404***	-0.5242***
	(-3.68)	(-2.59)	(-3.68)	(-2.59)	(-3.68)	(-2.59)	(-3.68)	(-2.59)
Year-fixed-effects	yes	yes	yes	yes	yes	yes	yes	yes
Industry-fixed-effects	yes	yes	yes	yes	yes	yes	yes	yes
Observations	751	751	751	751	751	751	751	751
Adjusted R2	0.067	0.078	0.067	0.078	0.067	0.078	0.067	0.078

Table 12 – Propensity Score Matching

Table 12 presents propensity score matching (PSM) analysis to estimate the social connection effect on premium. Bootstrap is applied to estimate the standard error and confidence interval. The average treatment effect on the treated (ATT) compares the outcome between treated and untreated groups in the matched sample. Nearest neighbour matching (NN) is adopted as the matching algorithm to compute ATT. In Panel 1a and Panel 1b, the treatment group is the deals in which acquirers and targets are socially connected. The control group in Panel 1a is matched non-connected deals with similar baseline characteristics (excluding target 52-week high reference point). The control group in Panel 1b is matched non-connected deals with similar baseline characteristics (including target 52-week high reference point). Similarly, the treatment group in Panel 2a and Panel 2b is first-degree connected deals, while the control group is matched non-connected deals with same firm and deal characteristics (excluding target 52-week high reference point in the characteristics of the control group in Panel 2a; including target 52-week high reference point in Panel 2b). Robust t-statistics are reported in brackets. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Panel 1a: Connection effect

Treatment group		Control group		ATT	*Standard Error*	*t*-value
Observation	166	Observation	142	-20.3%*	0.121	-1.668

Panel 1b: Connection effect (target 52-week high in matching sample)

Treatment group		Control group		ATT	*Standard Error*	*t*-value
Observation	153	Observation	135	-13.00%	0.100	-1.309

Panel 2a: First-degree connection effect

Treatment group		Control group		ATT	*Standard Error*	*t*-value
Observation	48	Observation	46	-15.3%***	0.065	-3.142

Panel 2b: First-degree connection effect (target 52-week high in matching sample)

Treatment group		Control group		ATT	*Standard Error*	*t*-value
Observation	47	Observation	43	-25.3%***	0.073	-3.447

Appendix A

Variables	Definitions	Source
	Panel A: Dependent Variables	
Acquisition premium	Premium is defined as the offer price, as the log percentage difference from the target's share price four weeks before the M&A deal announcement (Baker et al., 2012).	CRSP/SDC
	Panel B: Key Independent variables	
Connection	Dummy variable that equals 1 if acquirer and target share at least one 1st-degree or 2nd-degree connection.	BoardEx
1st-degree connection	Dummy variable that equals 1 if a director (including CEO) serves on the acquirer's and target's boards at the deal announcement.	BoardEx
2nd-degree connection	Dummy variable that equals 1 if a social tie between the respective CEOs or directors of merging companies is present at the deal announcement.	BoardEx
CEO connection	Dummy variable that equals 1 if either acquirer or target CEO connects the two merging firms.	BoardEx
CEO first-degree connection	Dummy variable that equals 1 if acquirer CEO (target CEO) also serves as a target board member (acquirer board member) or manager.	BoardEx
CEO second-degree connection	Dummy variable that equals 1 if acquirer or target CEO share past experience with board members or executives in the counterpart firm.	BoardEx
Board connection	Dummy variable that equals 1 if board members connect bidders with targets.	BoardEx
Board first-degree connection	Dummy variable that equals 1 if bidding firms and targets share the same board member.	BoardEx
Board second-degree connection	Dummy variable that equals 1 if two individuals respectively from acquirer and target boards have social ties through past experience.	BoardEx
Higher level positions for Acquirer (Target)	Dummy variable that equals 1 if an interlocking director holds a more important position in the acquirer (target) than in the target (acquirer), while the same level position indicates that directors hold the same level position in both firms.	BoardEx
T_retain	Dummy variable that equals 1 if a target director is offered a board seat in the combined firm after acquisition.	BoardEx
	Panel C: Firm characteristics	

Tobin's Q (Q)	In line with Masulis et al. (2007), we specify Tobin's Q as the ratio of market value by book value of the company's assets.	COMPUSTAT
Market Value (MV)	The market value represents the size of the company. It is calculated as the number of shares outstanding multiplied by the respective stock price at four weeks before the official deal announcement.	CRSP
Leverage	The ratio of total debt by total assets.	COMPUSTAT
Return on Assets (ROA)	We specify ROA as the ratio of the company's net income by the book value of total assets.	COMPUSTAT

	Panel D: Deal characteristics	
Transaction value ($millions)	This variable accounts for the total value of consideration paid by the acquirer in order to obtain the target. We report the total dollar value as reported by SDC.	SDC
Relative deal size	This variable is computed as the transaction value divided by the market capitalisation of the acquirer, four weeks before the official deal announcement.	SDC
Hostile takeover	Dummy variable that equals 1 if the M&A deal was reported as hostile.	SDC
Competing bid	Dummy variable that equals 1 if the M&A deal involved more than one bid.	SDC
Pure cash deal (Cash)	Dummy variable that equals 1 if the M&A deal was paid entirely by cash.	SDC
Pure stock deal (Stock)	Dummy variable that equals 1 if the M&A deal was paid entirely by stock.	SDC
52-week high (%)	Following Baker et al. (2012), we compute this variable as the log percentage difference of the target's 52-week high share price over the share price four weeks before the M&A deal announcement.	CRSP
X-week high (%)	Following Baker et al. (2012), we compute this variable as the log percentage difference of the target's X-week high share price over the share price four weeks before the M&A deal announcement.	
Stock Price run-up	The buy-and-hold returns of bidding firms over the period from 200 trading days to two months before the announcement.	CRSP