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journal homepage: [www.elsevier.com/locate/jfec](http://www.elsevier.com/locate/jfec)Acquirer-target social ties and merger outcomes<sup>☆</sup>Joy Ishii<sup>a</sup>, Yuhai Xuan<sup>b,\*</sup><sup>a</sup> Stanford Graduate School of Business, Knight Management Center, Stanford, CA 94305, USA<sup>b</sup> Harvard Business School, Soldiers Field, Boston, MA 02163, USA

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## ABSTRACT

This article investigates the effect of social ties between acquirers and targets on merger performance. We find that the extent of cross-firm social connection between directors and senior executives at the acquiring and the target firms has a significantly negative effect on the abnormal returns to the acquirer and to the combined entity upon merger announcement. Moreover, acquirer-target social ties significantly increase the likelihood that the target firm's chief executive officer (CEO) and a larger fraction of the target firm's pre-acquisition board of directors remain on the board of the combined firm after the merger. In addition, we find that acquirer CEOs are more likely to receive bonuses and are more richly compensated for completing mergers with targets that are highly connected to the acquiring firms, that acquisitions are more likely to take place between two firms that are well connected to each other through social ties, and that such acquisitions are more likely to subsequently be divested for performance-related reasons. Taken together, our results suggest that social ties between the acquirer and the target lead to poorer decision making and lower value creation for shareholders overall.

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## 1. Introduction

Boards of directors and top corporate executives occupy a rich and complex network of social ties. These ties can take many forms, including alumni networks from educational institutions, connections through employment activity, or other activities such as clubs or charitable organizations. Considerable evidence shows that social networks can influence decision-making processes or economic outcomes in a variety of settings, and a small but emerging literature considers the corporate finance implications of these connections in particular. This literature, however, has largely focused on *within*-firm ties such as social connections between board members or between the chief executive officer (CEO) and the board of directors of the same firm. Relatively little is known about the role of *cross*-firm social connections in driving corporate decisions.

In this paper, we investigate the impact of social ties between the senior executives and directors of the acquiring and the target firms on merger outcomes, focusing on

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ties across the two merging firms. We examine cross-firm social connections in the context of mergers and acquisitions because these are important events in the lives of firms that could have sizable impacts on shareholder wealth and require complex decision making on the part of the board of directors and top managers from both firms involved. The interactive nature of the negotiation and decision-making processes makes mergers corporate events in which cross-firm social ties are likely to be especially relevant. Understanding whether and how such connections between the acquirer and the target impact decision making and ultimately affect merger outcomes and shareholder value is, therefore, of particular importance.

One hypothesis is that extensive social ties across merging firms foster an enhanced flow of information, leading to better decision making. Under this view, connections lower the costs of gathering information, providing a means of efficient information exchange. For example, [Cohen, Frazzini, and Malloy \(2008\)](#) find that information is dispersed via educational networks between mutual fund managers and corporate boards. [Gompers and Xuan \(2008\)](#) and [Cai and Sevilir \(2012\)](#) show that a link such as a common venture capital investor or a common board member between the acquirer and the target helps reduce information asymmetry. [Ingram \(2000\)](#) shows that competing hotels have larger revenue per room when they share social ties, an effect at least partially credited to exchange of information. Under this hypothesis, social ties improve merger performance.

An alternative hypothesis is that extensive social ties between an acquirer and a target lead to less successful mergers due to flawed decision making based on weaker critical analysis, a lowering of standards, or missed opportunities. This kind of flawed decision making in the presence of social ties has a number of sources. First, social ties could lead to a heightened sense of trust. The principle of homophily implies that people are more likely to interact and be influenced by those who are similar to them (the “birds of a feather” concept well known in sociology; see, for example, [McPherson, Smith-Lovin, and Cook, 2001](#)). Decision makers could be more comfortable with one another and shift from a purely exchange-based mode of interaction to one based more on norms of trust. Social ties could then lead to more favorable interpretations of events and others’ actions ([Uzzi, 1996](#)). In the merger context, the existence of considerable social connections across top decision makers at acquirers and targets could lead firms to lower due diligence standards or overestimate the resulting synergistic gains and make firms more inclined to forgo better opportunities outside the network.

Second, significant empirical evidence now exists showing a familiarity bias under which individuals prefer status quo choices and familiar goods or people.<sup>1</sup> In financial markets, for example, investors display a home bias in domestic as well as international investing ([Coval](#)

and [Moskowitz, 1999](#); [French and Poterba, 1991](#)), and their preferences depend on the firm’s distance, language, and culture ([Grinblatt and Keloharju, 2001](#)). Many individuals also invest large amounts of their discretionary pension fund contributions in their own company stock ([Benartzi, 2001](#); [Meulbroek, 2005](#)). Firms also tend to cross-list their stocks in countries where investors are more familiar with them ([Sarkissian and Schill, 2004](#)). In the context of corporate mergers, this familiarity bias can manifest itself in a tendency toward inefficient deal making with firms with which top managers and directors have social ties, with insufficient regard for whether the merger makes sense strategically and intrinsically or whether a better candidate firm exists outside the network.

A third source of flawed decision making that could lead social ties to have a negative impact on merger outcomes is social conformity and groupthink. The social psychology literature demonstrates that individuals in group settings tend to conform to social norms. This is true even when the social consensus is clearly incorrect ([Asch, 1951](#)). Groupthink refers to a type of thinking in a cohesive group when critical analysis is dominated by a desire for unanimity, and groupthink behaviors are thought to be more likely to occur when the group is more homogeneous in terms of attitudes, approaches, or ideologies. Homophily and direct interactions based on educational and employment backgrounds provide a measure of the sort of homogeneity that is conducive to groupthink and poor decision making. Defects in decision making in cohesive groups often include consideration of only a limited range of options, failure to reexamine any options initially rejected, forgoing opportunities to consult with experts outside the group, ignoring information that does not support the favored policy, and insufficiently considering disadvantages of the favored decision ([Janis, 1982](#)). In the merger setting, these flaws in decision making by socially connected acquiring and target firms could again translate to failure to consider other potential merger candidates and overestimation of the synergistic gains as well as lowering of due diligence standards for the favored deal. Cross-firm social ties in the merger context are thus predicted to lead to weaker merger performance.

We test these hypotheses by estimating the relation between merger announcement returns and the extent of social ties between the top managers and directors of the two merging firms. We focus on educational background and employment history as the basis of the social networks that we use in our analyses. Educational institutions can be expected to form an effective basis for social ties for a variety of reasons, as discussed in [Cohen, Frazzini, and Malloy \(2008\)](#). Facilitated by alumni associations, college sports, and donation programs, the relationships formed during undergraduate or post-graduate programs often last well beyond the graduation date. Individuals from a common educational institution could also have other common interests or backgrounds that strengthen the ties formed there or foster later relationships. These educational ties can also be expected to be fairly exogenous. In addition to academic institutions, we use individuals’ past employment history as a basis for our network measure, as strong relationships could be formed through work

<sup>1</sup> See, for example, [Samuelson and Zeckhauser \(1988\)](#), [Zajonc \(1968\)](#), and [Saegert, Swap, and Zajonc \(1973\)](#).

environments, and these relationships could also be more recent.

One should note that it is difficult to pinpoint the existence or strength of prior social interactions between two individuals based on biographies or other traditional data sources. Our baseline measure of social ties, therefore, encompasses connections based on both direct prior interactions and homophily (i.e., an affinity for those who share similar backgrounds). We use the term “social connections” or “social ties” throughout the paper with the understanding that some of these ties are based on homophily. Nevertheless, we also consider refinements of our measure of social ties to increase the likelihood that direct interactions between two individuals occurred. We use additional data on the dates of academic degrees and dates of employment to require a time overlap. In another variation, we require pairs of individuals to have two or more ties. For the educational ties, we also begin at the level of the undergraduate or graduate academic institution and then focus in on the degree-granting department. Our results are consistent with the interpretation that a higher likelihood of direct interactions strengthens the effect, but the effects are present in all methods of measuring social ties, suggesting that social connections based on direct interactions as well as homophily have a significant impact on merger outcomes.

Using a sample of 539 mergers between publicly traded US firms between 1999 and 2007, we find that acquirers' announcement returns associated with a merger tend to be lower in the presence of many social connections. This is consistent with the view that social ties destroy value in merger decisions, but it could also be explained by social ties inducing a larger transfer from the acquirer to the target. Upon examining the relation between target announcement returns and social ties, we find no significant relation that would indicate that targets are overpaid based on social networks. We then consider the acquirer- and target-weighted average announcement return for the combined entity and confirm that the overall effect of social ties is significantly negative, both statistically and economically. A one-standard-deviation increase in the extent of social connection between the two firms reduces the three-day cumulative abnormal returns (CARs) to the combined entity by 0.6 to 0.9 percentage points, a reduction of more than 50% given the mean three-day CAR of 1% for the combined firm in the sample. This supports the view that the negative impact of social networks outweighs whatever positive information-based effects might be present.

To better understand these short-run performance results, we consider additional evidence on characteristics of the mergers and mechanisms through which the valuation effect could operate. We first investigate whether social connections between the acquirer and the target affect an important aspect of decision making in the merged firm, that is, the retention of the target firm's CEO or directors (Harford, 2003). Our results indicate that the degree of social connection between the acquirer and the target significantly increases the likelihood that the target firm's CEO and a larger fraction of the target firm's pre-acquisition board of directors remain on the board of the combined firm after the merger. This also holds true at the

level of individual target directors. An individual target director is more likely to be retained on the post-merger board the more connections he or she has to the acquirer's top managers and directors. Inefficient retention of the CEO or other top managers and directors on the basis of social connections could be one source of value destruction in mergers between highly socially connected firms.

Next, we examine the relation between social connections and the remuneration awarded to the acquirer CEO for completing the merger deal (Grinstein and Hribar, 2004; Harford and Li, 2007). We show that acquirer CEOs are more likely to receive bonuses and are more richly compensated for completing transactions with target firms that are highly socially connected to the acquiring firms. We also find that acquisitions are more likely to be announced and completed between two firms that are well connected to each other through social ties. Moreover, these acquisitions are subsequently more likely to be divested, particularly for performance-related reasons, indicating that these transactions are recognized ex post as bad decisions. Taken together, our results suggest that social connections between the acquirer and the target have a negative impact on merger outcomes. Acquirer-target social ties can lead to poorer decision making and lower value creation for shareholders as a whole. The negative effects of social connection between decision makers at the acquiring and the target firms could be one important potential source of value destruction in many merger transactions.

This paper builds on and contributes to two main strands of literature. First, it is related to a growing literature on the role of social ties and networks in financial contexts and, more broadly, on the influence of individual managers and directors on corporate decisions and outcomes (e.g., Bertrand and Schoar, 2003; Xuan, 2009).<sup>2</sup> A number of studies have investigated the impact of connections within the board of directors or between the CEO and the board of directors of the same firm, using these within-firm connections as proxies for internal corporate governance to examine how corporate decisions and outcomes are affected as a result (e.g., Fracassi and Tate, 2008; Schmidt, 2008; Hwang and Kim, 2009). Our approach is different in that we focus not on within-firm connections, but instead on cross-firm connections, using connection measures that are based on the directors and top executives of both merging firms.

In addition to the literature on social networks, this paper is related to the mergers and acquisitions literature. Prior research has evaluated the success and value consequences of mergers by studying the change in firm value at the time of the announcement of the acquisition, the long-run stock returns to the acquirer, and the post-merger firm

<sup>2</sup> For example, the impact of social networks has been investigated in a variety of financial contexts including the stock market participation decision (Brown, Ivkovic, Smith, and Weisbenner, 2008), CEO pay (Hallock, 1997; Barnea and Guedj, 2006), corporate investment (Fracassi, 2008), allocations in equity issues (Cornelli and Goldreich, 2001), private equity transactions (Stuart and Yim, 2010), venture capital performance (Hochberg, Ljungqvist, and Lu, 2007), and mutual fund performance and trading behaviors (Hong, Kubik, and Stein, 2005; Cohen, Frazzini, and Malloy, 2008; Kuhnen, 2009).

operating performance.<sup>3</sup> The vast majority of this work focuses on deal characteristics or (*within*-)firm characteristics in explaining merger outcomes, such as method of payment (e.g., Travlos, 1987), Q (e.g., Servaes, 1991), leverage (e.g., Maloney, McCormick, and Mitchell, 1993), cash (e.g., Harford, 1999), size (e.g., Moeller, Schlingemann, and Stulz, 2004), and organizational structure (e.g., Maksimovic and Phillips, 2008).

What has been less explored in the literature is the relationship *between* the acquirer and the target and its effect on merger outcomes. Morck, Shleifer, and Vishny (1990) investigate the relation between the acquirer–target industry relatedness and the acquisition success and show that diversifying acquisitions have lower abnormal returns. Gompers and Xuan (2008) study the role of common venture capital investors in alleviating the asymmetric information between the public acquirers and private venture capital-backed targets. Hoberg and Phillips (2010) examine product market synergies through asset complementarities between firms in mergers and acquisitions. Ahern and Harford (2014) focus on the industry links in the form of supplier–customer relationships between merging firms. To the best of our knowledge, our paper is the first study that examines the direct link between decision makers at the acquiring and the target firms and its implications for merger outcomes.

Moreover, given the likely positive and negative impacts of social connections on decision making, the paper offers useful insights into assessing the total effects of social ties in the context of corporate mergers and acquisitions. Our results suggest that in mergers involving large, public firms, the negative impact of social connections on decision making outweighs any positive information-based impact that might be present. Even when the positive role of social ties in enhancing information exchange is likely to be more relevant, e.g., in deals involving small (or private) targets when information is more likely to be scarce, our evidence suggests that it is only able to offset the negative decision-making effects, rather than produce a significant net benefit.<sup>4</sup>

The remainder of this paper is organized as follows. Section 2 discusses the data and the construction of the variables. Sections 3 and 4 establish the main results, focusing on the announcement period abnormal returns, the target board and CEO retention, the acquirer CEO compensation, the probability of acquisition, and the probability of subsequent divestiture. Section 5 concludes.

## 2. Data

### 2.1. Sample and variable construction

The data used in this paper are generated from several different data sets. We first identify mergers and acquisitions with announcement dates between 1999 and 2007 using the Securities Data Company (SDC) US Mergers and Acquisitions

database. We require that both the acquirer and target be publicly traded in the US, because we examine announcement returns associated with both the acquirer and the target. We also require that the acquisition be completed and that 100% of the target be acquired after the transaction. We obtain relevant data from SDC including the acquisition announcement date, the value of the transaction, and the percentage of stock and cash used to pay for the acquisition. We then use Factiva news searches and the company annual reports to fill in any missing values by hand and correct any inaccurate information reported by SDC, when possible. We merge our sample of acquirers and targets with Compustat to get financial data and with the Center for Research in Security Prices (CRSP) to get data on returns.

The data on social connections are derived from files purchased from BoardEx of Management Diagnostics Limited. These data contain extensive biographical information on corporate directors and top executives including educational degrees, employment history, and other professional and social activities from 1999 to 2007.<sup>5</sup> Firms and directors are endowed with codes in the data to enable links to be drawn between individuals in the database based on these biographical details. However, because BoardEx collects and codes the biographical information from various public sources including news releases and individual resumes, the same firm frequently gets several different codes as its name can be referenced with slight variations in different sources. For example, McKinsey & Co. is given a company identification (ID) of 104667, while McKinsey & Co. Inc. is coded as a different company with ID 1001337. We, therefore, hand-cleaned the data by manually going through each firm reference to correct mistakes in the BoardEx files and make sure that the same firm is assigned the same code. We also hand-coded educational institutions to draw links based on academic background. Data from BoardEx are merged by hand with our sample of mergers and acquisitions using company name and stock symbol.

We construct our measure of social ties by focusing on the educational background and employment history of the board members and senior executives. As a first cut, we identify two individuals (executives or directors) as sharing an educational tie if they both obtained degrees from the same academic institution. These could be either undergraduate or graduate degrees. For example, two executives or directors who both attended Brown University would be classified as sharing a connection. Similarly, we identify two individuals as sharing a past employment tie if they both worked at the same company in the past. Overall, we define two people as being socially connected if they share any of the ties defined above.<sup>6</sup>

Our proxy for social connection between an acquirer and a target is then defined in the following manner. For each acquisition, we define a matrix consisting of all the directors and top executives of the two companies. Each element of the matrix is a pair of individuals composed of one member from

<sup>3</sup> See, for example, Jensen and Ruback (1983), Healy, Palepu, and Ruback (1992), Andrade, Mitchell, and Stafford (2001), and Moeller, Schlingemann, and Stulz (2004), among many others.

<sup>4</sup> We examine whether the effects of social ties differ for small firms using a sample of merger and acquisition deals involving small targets and discuss the findings and their implications in Section 3.2.

<sup>5</sup> Although BoardEx coverage starts in 1999, the data in 1999 are highly incomplete.

<sup>6</sup> Considering other forms of social ties including shared membership in clubs, charitable organizations, and so on does not change the results. We exclude these ties because the reporting is noisier and more random in the BoardEx data.

the acquirer and one member from the target. The total number of elements in the matrix, therefore, represents the total number of such pairs and equals the total number of directors and executives of the acquirer times the total number of directors and executives of the target. We count the total number of connected pairs and divide by the total number of pairs to form Average Connection. Average Connection captures the extent to which the decision makers of the acquirer and the target are connected socially. For instance, an Average Connection of 10% between an acquirer with a ten-person board or management team and a target with an eight-person board or management team indicates that out of a total of 80 ( $10 \times 8$ ) pairs of individuals between the two firms, eight pairs are connected based on education and employment ties. For us to compute this connectedness measure and for an acquisition to be retained in our final sample, both the acquirer and the target must have coverage in the BoardEx files.

## 2.2. Descriptive statistics

Our final sample consists of 539 acquisitions in which both the acquirer and the target are US public companies between 1999 and 2007. Table 1 shows the number of acquisitions by year. We report the numbers for the full sample first, followed by subsamples based on the Average Connection between the acquirer and the target. High Social Connection indicates that the Average Connection between the acquirer and the target is above the sample median, and Low Social Connection indicates that this Average Connection is below the sample median. While acquisitions in 1999 represent only 3% of the sample, the transactions are roughly evenly distributed in the early 2000s and then become concentrated in the last three years of the sample.<sup>7</sup> This pattern reflects the breadth and quality of the data coverage by BoardEx, which starts with only partial coverage in 1999 and becomes greater over time. The pattern of observations across years is similar across the subsamples of high and low levels of social connection, which are, in turn, similar to the sample as a whole. It does not appear that there are major shifts in our measure of social connection in the mergers within our sample period.

Table 2 reports the number of acquisitions in our sample by the industry of the acquirer, defined using the 12 Fama-French industry categories.<sup>8</sup> The three industries most frequently represented in our sample are finance, business equipment (which includes computers, software, and electronic equipment), and health care. Subsamples based on whether the Average Connection between the acquirer and the target is below or above the sample median indicate that acquisitions in most industries are fairly evenly divided between high and low levels of social connection, but certain industries involve more highly connected acquirers and targets than others. For example, the majority of acquisitions in the health care industry see high social connections between the acquiring firm and

**Table 1**

Number of acquisitions by year.

This table indicates by year the number of acquisitions in our sample. The acquirers and the targets are US public companies. Numbers for the full sample are presented first, followed by a breakout based on the degree of social connection between the acquirer and the target. High Social Connection indicates that the Average Connection between the acquirer and the target is above sample median. Low Social Connection indicates that the Average Connection between the acquirer and the target is below sample median. Average Connection is calculated as the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target.

Year	Full sample		High social connection		Low social connection	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
1999	15	2.8	11	4.1	4	1.5
2000	34	6.3	24	8.9	10	3.7
2001	49	9.1	31	11.5	18	6.7
2002	35	6.5	18	6.7	17	6.3
2003	44	8.2	29	10.7	15	5.6
2004	57	10.6	25	9.3	32	11.9
2005	81	15.0	43	15.9	38	14.1
2006	109	20.2	42	15.6	67	24.9
2007	115	21.3	47	17.4	68	25.3
Total	539	100	270	100	269	100

the target firm. In our analysis, we include year fixed effects and industry fixed effects to control for potential systematic time effects and industry differences.

We present sample summary statistics in Table 3. The Average Connection between the acquirer and the target is approximately 11% for the full sample. Compared with acquirers that have a lower degree of social connection with the targets, acquirers that are more connected with the targets on average are similar in assets, cash flow, and stock performance prior to the merger announcement but have a higher *Q* and a lower debt-to-assets ratio.<sup>9</sup> The deal characteristics indicate that acquirers that are more connected with the targets engage in larger transactions in absolute value than acquirers that are less connected with the targets. But, as a percentage of the acquirer market capitalization, the relative deal size is similar for both groups. The deals are also equally likely to be in related industries or to be tender offers.<sup>10</sup> Focusing on the method of payment, we see that deals in which the acquirer and the target are more connected are

<sup>7</sup> Eliminating data from 1999 from the analysis does not alter our results.

<sup>8</sup> See Ken French's website at [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html) for the definition of the 12 Fama-French industry categories.

<sup>9</sup> Cash flow is operating income before depreciation (Compustat Industrial Annual Item 13). Prior year stock performance is defined as the buy-and-hold abnormal return over days  $-219$  to  $-20$  relative to the merger announcement date using the CRSP value-weighted index as the market return (Harford, Humphery-Jenner, and Powell, 2012). *Q* is defined as the book value of assets (Item 6) plus the market value of equity (end-of-year price, Item 199, times end-of-year shares outstanding, Item 25) minus book equity all over assets. Book equity is defined as total assets less total liabilities (Item 181) and preferred stock (Item 10) plus deferred taxes (Item 35) and convertible debt (Item 79). Debt is defined as the sum of long-term debt (Item 9) and debt in current liabilities (Item 34).

<sup>10</sup> A deal is classified as related if the target and the acquirer have the same two-digit standard industrial classification (SIC) code. Defining relatedness using four-digit SIC codes does not alter the results.

**Table 2**

Number of acquisitions by industry of acquirer.

This table indicates by industry the number of acquisitions in our sample. Industries are defined by the Fama-French 12-industry categories, and acquisitions are assigned to one of the 12 industry categories based on the SIC code of the acquirer. The acquirers and the targets are US public companies. Numbers for the full sample are presented first, followed by a breakout based on the degree of social connection between the acquirer and the target. High Social Connection indicates that the Average Connection between the acquirer and the target is above sample median. Low Social Connection indicates that the Average Connection between the acquirer and the target is below sample median. Average Connection is calculated as the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target.

Fama-French industry	Full sample		High social connection		Low social connection	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Consumer nondurables	15	2.8	8	3.0	7	2.6
Consumer durables	4	0.7	1	0.4	3	1.1
Manufacturing	37	6.9	13	4.8	24	8.9
Oil, gas and coal	32	5.9	17	6.3	15	5.6
Chemical products	7	1.3	3	1.1	4	1.5
Business equipment	126	23.4	71	26.3	55	20.4
Telephone and television	23	4.3	13	4.8	10	3.7
Utilities	11	2.0	6	2.2	5	1.9
Wholesale and retail	37	6.9	16	5.9	21	7.8
Health care	70	13.0	57	21.1	13	4.8
Finance	135	25.0	47	17.4	88	32.7
Other	42	7.8	18	6.7	24	8.9
Total	539	100.0	270	100.0	269	100.0

**Table 3**

Summary statistics.

This table presents summary statistics for the acquisitions in our sample. The acquirers and the targets are US public companies. Numbers for the full sample are presented first, followed by a breakout based on the degree of social connection between the acquirer and the target measured by average connection. Average Connection calculates the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. High Social Connection indicates that the Average Connection between the acquirer and the target is above sample median. Low Social Connection indicates that the Average Connection between the acquirer and the target is below sample median.  $Q$  is defined as the book value of assets (Compustat Industrial Annual Item 6) plus the market value of equity (end-of-year price, Item 199, times end-of-year shares outstanding, Item 25) minus book equity all over assets. Book equity is defined as total assets less total liabilities (Item 181) and preferred stock (Item 10) plus deferred taxes (Item 35) and convertible debt (Item 79). Debt is defined as the sum of long-term debt (Item 9) and debt in current liabilities (Item 34). Cash flow is operating income before depreciation (Item 13). Stock performance is defined as the buy-and-hold abnormal return over days  $-219$  to  $-20$  relative to the merger announcement date using the CRSP value-weighted index as the market return. Relative transaction value is calculated as transaction value divided by acquirer market capitalization. A deal is classified as related if the target and the acquirer have the same two-digit SIC code. A pure stock (cash) deal implies that the acquisition is paid for 100% with stock (cash). Asterisks denote statistically significant differences between the two sub-samples at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Variable name	Full sample		High social connection		Low social connection	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
<b>Acquirer characteristics</b>						
Assets (\$ millions)	38,627.33	138,519.00	40,968.96	157,563.70	36,276.94	116,570.10
$Q$	2.11	1.65	2.41	2.02	1.81***	1.09
Debt/assets	0.21	0.18	0.20	0.17	0.23**	0.18
Cash flow/assets	0.11	0.13	0.11	0.15	0.10	0.11
Stock performance	0.10	0.36	0.08	0.31	0.12	0.40
Average connection	10.6%	0.13	18.0%	0.15	3.2%***	0.02
<b>Deal characteristics</b>						
Transaction value (\$ millions)	3,509.52	8,903.47	4,788.63	11,338.42	2,230.41***	5,195.66
Relative transaction value	0.41	0.51	0.44	0.54	0.38	0.47
Related deal	71.9%	0.45	69.7%	0.46	74.2%	0.44
Tender offer	9.1%	0.29	8.6%	0.28	9.6%	0.30
Pure cash deal	31.7%	0.47	30.7%	0.46	32.7%	0.47
Pure stock deal	23.9%	0.43	29.6%	0.46	18.2%***	0.39
Number of observations	539		270		269	

more likely to be 100% financed with equity compared with deals in which the acquirer and the target have less social connection. These summary statistics suggest that acquisitions with different degrees of social connection between the

acquirer and the target vary on some dimensions, and we control for these differences in our regression analysis.

Also, with average acquirer assets of \$38.6 billion, our sample is tilted toward larger firms. This is a reflection of

coverage in the BoardEx database. We control for size in our analysis, but this feature of the data has some implications for our interpretation of the results, which we discuss in the next section.

### 3. Announcement period abnormal returns

In this section, we study the market's reaction to the acquisition announcement, examining the impact of social ties between the acquirer and the target on the abnormal returns around the announcement period. We calculate the announcement period abnormal returns following the standard estimation methodology for event studies with daily returns as in [Brown and Warner \(1985\)](#). We use trading days  $-200$  through  $-20$  relative to the event date as the estimation period for each transaction in the sample. Over this estimation period, the company daily returns are regressed on the value-weighted returns on the market portfolio. We require that a stock have at least 30 non-missing daily returns in days  $-200$  through  $-20$  to be included in the estimation. The difference between the actual daily return and the market model predicted daily return using the estimated factor loadings from the regression results is the daily abnormal return. We cumulate the daily abnormal returns over the event window and use the cumulative abnormal returns as the measure of abnormal performance upon announcement of the acquisition.

#### 3.1. Univariate analysis

[Table 4](#) tabulates the cumulative abnormal returns upon acquisition announcement for the full sample, followed by a breakout based on the extent of social ties between the acquirer and the target. We report the CARs for the acquiring firm, the target firm, and the combined entity over the three-day event window (one day before the announcement to one day after the announcement  $[-1, +1]$ ), the five-day event window  $([-2, +2])$ , and the seven-day event window  $([-3, +3])$ .

The acquirer's stock on average reacts negatively to the acquisition announcement for the full sample. This negative reaction, however, is much more severe for the acquisitions in which the acquirer and the target share extensive social ties. Acquirers with a high Average Connection with their targets (High Social Connection) experience a negative abnormal return of almost 3% over the three-day period around the acquisition announcement, a negative reaction almost three times as large in magnitude as that for the acquirers with lower Average Connection (Low Social Connection). This difference in CARs is significant at the 1% level, and the effect remains similar across different event windows. The Wilcoxon rank-sum test confirms that the distributions of the CARs for the acquirers with different extent of social connection with the targets are statistically different. These results suggest that cross-firm social ties are associated with a loss of value to the acquirer's shareholders upon the merger announcement.

**Table 4**

Cumulative abnormal returns around acquisition announcement.

This table presents the cumulative abnormal returns (CARs) upon acquisition announcement for the acquiring firms, the target firms, and the combined firms. We report CARs over the three-day event window  $([-1, +1])$ , the five-day event window  $([-2, +2])$ , and the seven-day event window  $([-3, +3])$ . Numbers for the full sample are presented first, followed by a breakout based on the degree of social connection between the acquirer and the target measured by average connection. Average Connection calculates the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. High Social Connection indicates that the Average Connection between the acquirer and the target is above sample median. Low Social Connection indicates that the Average Connection between the acquirer and the target is below sample median. The CAR for the combined firm is calculated as the market value-weighted average of the CAR for the acquirer and the CAR for the target. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

CARs	Full sample		High social connection		Low social connection		Difference between low and high	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	t-Value (t-test)	z-Value (Wilcoxon test)
<b>Acquirer</b>								
$[-1, +1]$	-1.97%	0.069	-2.92%	0.072	-1.01%	0.064	3.24***	2.45**
$[-2, +2]$	-1.92%	0.071	-2.96%	0.074	-0.88%	0.066	3.43***	2.82***
$[-3, +3]$	-2.20%	0.077	-3.42%	0.085	-0.98%	0.066	3.73***	2.80***
Number of observations	539		270		269			
<b>Target</b>								
$[-1, +1]$	20.06%	0.188	19.97%	0.194	20.15%	0.182	0.11	0.66
$[-2, +2]$	20.63%	0.187	20.42%	0.194	20.85%	0.180	0.26	0.68
$[-3, +3]$	20.92%	0.191	20.66%	0.199	21.19%	0.183	0.31	0.82
Number of observations	519		263		256			
<b>Combined</b>								
$[-1, +1]$	1.04%	0.063	0.45%	0.063	1.64%	0.062	2.17**	2.02**
$[-2, +2]$	1.15%	0.065	0.42%	0.067	1.90%	0.062	2.61***	2.12**
$[-3, +3]$	0.94%	0.072	0.09%	0.078	1.83%	0.064	2.78***	2.22**
Number of observations	519		263		256			

We next examine the target's stock reaction around the announcement. An acquirer's lower announcement period return in the presence of extensive social ties might just result from its overpaying the target more than an acquirer without social connections would. If this is the case, one would expect a target with higher social connection to the acquirer to have higher CARs around the merger announcement. Table 4 indicates that, consistent with prior research, targets on average enjoy a highly positive and significant abnormal return of approximately 20% around the acquisition announcement. However, the CARs are not higher for targets with high social connection with their acquirers. If anything, they are slightly lower across all event windows, although the difference is not statistically significant. Acquirers that have extensive social ties with their targets, therefore, do not seem to overpay relative to those acquirers without such ties. Acquisitions in which the acquirer and the target are highly socially connected appear to destroy value instead of merely transferring wealth from the acquirer's shareholders to the target's shareholders.

To fully assess the relation between social ties and the value consequence of acquisitions, we then study the announcement returns for the combined entity. Following the methods used by Bradley, Desai, and Kim (1988) and Kaplan and Weisbach (1992), we calculate the combined abnormal returns to acquirer and target shareholders as the market value-weighted average of the CARs for the acquirer and the target, using as weights the market value of equity of each firm four trading days before the acquisition announcement. The combined change in value of both the acquirer and the target measures the total economic impact of the acquisition for shareholders overall (Kaplan, 2006).

Consistent with Andrade, Mitchell, and Stafford (2001), we find that the combined announcement returns are significantly positive for the full sample, indicating that the acquisitions create value on average from the perspective of all shareholders. On closer examination, however, the value creation comes almost entirely from acquisitions in which the extent of social connection is low. In acquisitions in which the acquirer and the target are highly connected socially, the shareholders of both firms as a combined entity do not gain value. The average combined CARs are not significantly different from zero. In contrast, when the social connection between the acquirer and the target is low, the combined values of the acquirer and the target rise by 1.6% to 1.9% of the total initial value of the acquirer and the target, an increase significantly different from zero and significantly higher than that in the acquisitions with high social connections. This evidence suggests that social ties between the acquirer and the target are associated with lower value creation for shareholders overall.

### 3.2. Regression analysis

In this section, we explore the relation between social connection and announcement returns using multivariate ordinary least squares (OLS) regressions, which allow us to control for deal characteristics and firm characteristics that could affect the stock market's reaction to the acquisition

announcement. We examine returns for the acquirer, the target, and the combined entity in turn.

Table 5 focuses on acquirer returns. The dependent variable is the three-day cumulative abnormal returns (CAR[−1, +1]) for the acquirer. Our key independent variable, Average Connection, is a continuous variable defined in Section 2 that measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target. In Column 1, we include as the only independent variable Average Connection based on all ties, and in Column 2, we add standard controls for the size, Q, leverage, cash flow, and prior year stock performance of the acquirer, the relative size of the acquisition, whether the acquisition is financed 100% with equity, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer. The coefficient on Average Connection is negative and significant at the 1% level. With the addition of year fixed effects in Column 3 and both year and industry fixed effects in Column 4, the coefficients on Average Connection remain negative and highly significant statistically and economically. A one-standard-deviation increase in Average Connection between the acquirer and the target (13.0%) decreases the three-day CAR by 0.85 to 1.3 percentage points.

In Columns 5 and 6, we calculate Average Connection based on educational ties only. In Column 5, an acquirer-target pair of directors and executives is considered socially connected if the pair went to the same educational institution (e.g., Harvard University). In Column 6, an acquirer-target pair of directors and executives is considered socially connected if the pair went to the same educational institution and likely received the same degree (e.g., Harvard Business School). Average connection between the acquirer and the target based on educational ties is negatively associated with acquirer returns, especially when the connected pair attended the same program at the same school. While this difference is not statistically significant, it is economically significant, with a one-standard-deviation increase in ties based on attendance at the same program at the same school associated with a 15% greater effect than a corresponding one-standard-deviation increase in ties based on attendance at the same school. Similarly, we calculate Average Connection in Column 7 based on past employment ties only. The coefficient on Average Connection remains significantly negative.

In Column 8, we require an overlap in time in our measure of social ties. While it is difficult to ensure that direct interaction occurred between a pair of individuals, these overlapping ties are more likely to reflect this kind of direct interaction than the baseline measure of connections. An overlapping tie could also reflect a stronger sense of homophily if two directors or executives were part of the same cohort at a school or workplace, and, thus, overlapping ties could have a greater effect. A pair of directors or executives is considered socially connected if both received their degrees from the same educational institution within three years of each other or if they overlapped in time at a previous place of employment.



**Table 5**

Acquirer cumulative abnormal returns.

This table reports results of OLS regressions for acquirer cumulative abnormal returns. The dependent variable is the cumulative abnormal return over the three-day event window ( $CAR[-1, +1]$ ) for the acquirer. Average Connection measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target. Social connection is defined based on all ties across all the directors and top executives of the acquirer and the target in Columns 1 through 4; based on educational ties across all the directors and top executives of the acquirer and the target in Columns 5 and 6, with Column 5 focusing on ties based on common educational institutions and Column 6 focusing on ties based on common educational institutions and common degrees; based on past employment ties across all the directors and top executives of the acquirer and the target in Column 7; based on overlapping ties across all the directors and top executives of the acquirer and the target in Column 8, where a pair of individuals is defined as connected only if there is an overlap in time in their social ties; based on strong ties across all the directors and top executives of the acquirer and the target in Column 9, where a strongly connected pair is defined as a pair of individuals sharing two or more social ties; based on all ties between the CEO of the acquirer and the directors and top executives of the target in Column 10; and based on all ties across all the directors and top executives of the acquirer and the target calculated using only the top five well-connected educational institutions in Column 11 and using only the non-top five educational institutions in Column 12. Control variables include the size,  $Q$ , leverage, cash flow, and stock performance of the acquirer, the relative size of the acquisition, and dummy variables indicating whether the transaction is financed 100% with stock, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Independent variable	CAR[-1, +1]											
	All ties				Educational ties		Employment ties	Overlapping ties	Strong ties	CEO ties	Top 5 schools only	Top 5 schools excluded
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Average connection	-0.097*** [0.025]	-0.079*** [0.025]	-0.065** [0.026]	-0.065** [0.026]	-0.131* [0.077]	-0.205* [0.105]	-0.050* [0.026]	-0.091*** [0.033]	-0.238* [0.132]	-0.031** [0.014]	-0.061** [0.026]	-0.055** [0.027]
Acquirer log assets		-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]
Acquirer $Q$		-0.008*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]	-0.007*** [0.002]
Acquirer debt/assets		0.029* [0.017]	0.030* [0.017]	0.013 [0.019]	0.014 [0.019]	0.014 [0.019]	0.014 [0.019]	0.013 [0.019]	0.015 [0.019]	0.011 [0.019]	0.013 [0.019]	0.013 [0.019]
Acquirer cash flow/assets		0.052 [0.037]	0.052 [0.035]	0.048 [0.037]	0.049 [0.037]	0.048 [0.037]	0.047 [0.037]	0.047 [0.036]	0.047 [0.037]	0.049 [0.037]	0.048 [0.036]	0.048 [0.037]
Acquirer stock performance			0.001 [0.009]	0.003 [0.009]	0.005 [0.009]	0.005 [0.010]	0.005 [0.010]	0.006 [0.009]	0.005 [0.010]	0.006 [0.010]	0.005 [0.009]	0.005 [0.009]
Relative transaction value		-0.010 [0.011]	-0.007 [0.011]	-0.011 [0.010]	-0.012 [0.010]	-0.012 [0.010]	-0.011 [0.010]	-0.010 [0.010]	-0.012 [0.010]	-0.011 [0.010]	-0.011 [0.010]	-0.011 [0.010]
Pure stock deal?		-0.017** [0.008]	-0.013 [0.008]	-0.011 [0.008]	-0.011 [0.008]	-0.011 [0.008]	-0.012 [0.008]	-0.011 [0.008]	-0.010 [0.008]	-0.012 [0.008]	-0.012 [0.008]	-0.012 [0.008]
Related deal?		-0.003 [0.007]	-0.002 [0.007]	-0.003 [0.007]	-0.002 [0.007]	-0.002 [0.007]	-0.002 [0.007]	-0.002 [0.007]	-0.002 [0.007]	-0.001 [0.007]	-0.002 [0.007]	-0.002 [0.007]
Tender offer?		0.016** [0.007]	0.014* [0.007]	0.012* [0.007]	0.013* [0.007]	0.013* [0.007]	0.012* [0.007]	0.011 [0.007]	0.012* [0.007]	0.013* [0.007]	0.012* [0.007]	0.012* [0.007]
Year fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	539	505	505	505	505	505	505	505	505	497	505	505
$R^2$	0.03	0.11	0.13	0.18	0.17	0.17	0.17	0.18	0.17	0.17	0.17	0.17

Our results remain strong after requiring a time overlap in social ties. The coefficient on Average Connection calculated with overlapping ties is negative and significant at the 1% level, with a larger absolute magnitude than the baseline results in Column 4. The difference, while not statistically significant, is economically significant. A one-standard-deviation increase in connections based on overlapping ties has a 19% stronger negative effect on acquirer announcement returns than a one-standard-deviation increase in our baseline connection measure.

In Column 9, we account for the strength of the connection between pairs of individuals in a different way. We recompute the Average Connection variable to measure the percentage of strongly connected pairs across the directors and top executives of the acquirer and the target, where a strong connection is defined as one in which the pair of individuals shares two or more social ties based on educational institutions and past jobs. These strong social ties could have an even greater effect because a pair with a strong social tie is more likely to have a significant personal connection. Indeed, with this measure as the key explanatory variable in Column 9, the coefficient is significantly negative, with an absolute magnitude that is significantly larger (at the 10% level) than the baseline results in Column 4. In Column 10, Average Connection is redefined using acquirer CEO ties only. For each director and executive of the target, we examine whether he or she is socially connected with the acquirer's CEO based on education and past employment ties. We then calculate Average Connection as the percentage of the target's directors and executives who are socially connected with the acquirer's CEO.<sup>11</sup> Average Connection based on acquirer CEO ties is again negatively related to acquirer CAR. A one-standard-deviation increase in average CEO connection is associated with a decrease of 0.7 percentage points in acquirer CAR, significant at the 5% level.

Finally, in Columns 11 and 12, we address a potential selection effect. Individuals from certain institutions and employers could be more likely to be well connected, and connections that appear frequently in the data (e.g., educational ties based on Harvard University) could be associated with particular types of managers who tend to engage in certain types of merger behavior. Such a selection effect could imply that the results are driven by managerial types instead of by social connections. However, to at least partially explain our results, this selection story requires that graduation from a frequently appearing institution such as Harvard is associated with a tendency toward value-destroying acquisitions. Nevertheless, it is useful to address this issue because the top institutions contribute a substantial number of connections. The five educational institutions contributing the largest number of ties are Harvard University, Stanford University, the University of Pennsylvania, the University of Michigan, and Columbia University. Combined, these five institutions contribute almost 54% of the educational ties. We recompute our Average Connection measure once when we include only educational institutions amongst the top five and once when we include only educational institutions

outside the top five. We include these as the primary explanatory variables of interest in Columns 11 and 12, respectively. In both specifications, the coefficients are negative and significant, alleviating concerns that selection based on managerial types associated with particular schools is the main driver of the results.<sup>12</sup> Overall, the results in Table 5 show that social connection between the acquirer and the target has a robust negative value impact on shareholders of the acquirer, all else equal.

Target returns are examined in Table 6. The dependent variable is the three-day cumulative abnormal returns (CAR  $[-1, +1]$ ) for the target. Average Connection, the independent variable of interest, measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target based on all ties. The negative and significant coefficient on Average Connection in Column 1 indicates that more social ties between the acquirer and the target lead to lower announcement returns for the target as well. When we add to the regression year and industry fixed effects as well as controls for the size,  $Q$ , leverage, cash flow, and prior year stock performance of the target, the relative size of the acquisition, whether the acquisition is financed 100% with equity, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer, the coefficient on Average Connection is no longer significant. The social connection between the acquirer and the target does not seem to influence the target's stock reaction to the acquisition announcement. Thus, the acquirers with higher social connection with the targets do not appear to be overpaying relative to the acquirers without such connections.<sup>13</sup>

We examine the announcement returns for the acquirer and the target as a combined entity in Table 7. The dependent variable is the combined abnormal returns to acquirer and target shareholders computed as the market value-weighted average of the CARs for the acquirer and the target over the three-day event window around announcement. In Column 1, we include Average Connection as the only independent variable, and we add controls in Column 2 for the size,  $Q$ , leverage, and cash flow of the combined entity, the relative size of the acquisition, whether the acquisition is financed 100% with equity, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer.<sup>14</sup> Column 3 includes year fixed effects, and Column 4 adds industry fixed effects as well. Across all specifications, Average Connection is consistently negative

<sup>12</sup> While there is substantial concentration among educational institutions, relatively less concentration exists in the contributions of particular employers to our social ties measure. Combined, the top five employers contribute 13.8% of the job ties, for an average of 2.8% per top five employer. Dropping the top five employers yields qualitatively similar results.

<sup>13</sup> We also examine the transaction multiples for the target such as enterprise value to earnings before interest, taxes, depreciation, and amortization (EBITDA) and equity value to earnings and confirm that there is no robust relation between social connections and the extent of overpayment.

<sup>14</sup>  $Q$  (leverage, cash flow) of the combined firm is calculated as the asset-weighted average of  $Q$  (leverage, cash flow) of the acquirer and  $Q$  (leverage, cash flow) of the target.

<sup>11</sup> Average Connection based on acquirer CEO ties has a mean of 12.8% and a standard deviation of 21.3%.

**Table 6**

Target cumulative abnormal returns.

This table reports results of OLS regressions for target cumulative abnormal returns. The dependent variable is the cumulative abnormal return over the three-day event window (CAR[−1, +1]) for the target. Average Connection measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. Control variables include the size, Q, leverage, cash flow, and stock performance of the target, the relative size of the acquisition, and dummy variables indicating whether the transaction is financed 100% with stock, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Independent variable	CAR[−1, +1]			
	(1)	(2)	(3)	(4)
Average connection	−0.114* [0.058]	0.000 [0.068]	0.020 [0.072]	0.053 [0.073]
Target log assets		−0.025*** [0.005]	−0.024*** [0.005]	−0.026*** [0.005]
Target Q		−0.017*** [0.006]	−0.017*** [0.006]	−0.020*** [0.007]
Target debt/assets		−0.041 [0.053]	−0.044 [0.054]	−0.045 [0.055]
Target cash flow/assets		0.039 [0.072]	0.033 [0.075]	0.070 [0.076]
Target stock performance		−0.025 [0.023]	−0.019 [0.024]	−0.014 [0.024]
Relative transaction value		−0.049*** [0.016]	−0.049*** [0.017]	−0.051*** [0.016]
Pure stock deal?		−0.054*** [0.018]	−0.052*** [0.018]	−0.051*** [0.018]
Related deal?		0.028 [0.018]	0.026 [0.018]	0.034* [0.019]
Tender offer?		0.047 [0.030]	0.045 [0.032]	0.036 [0.031]
Year fixed effects	No	No	Yes	Yes
Industry fixed effects	No	No	No	Yes
Number of observations	519	479	479	479
R <sup>2</sup>	0.01	0.14	0.16	0.21

and significant at the 10% level or better. A one-standard-deviation (13%) increase in Average Connection reduces the abnormal returns to the combined entity by 0.6 to 0.9 percentage points, a reduction of more than 50% given the mean three-day CAR of 1% for the combined entity.

Overall, our findings from the regression analysis corroborate the univariate results. The negative effect of between-firm social connections on announcement returns cannot be explained away by firm and deal characteristics. From the perspective of the acquirer's shareholders, the market reacts less favorably to acquisitions in the presence of more social ties between the two firms involved in the transaction. The target's shareholders, however, do not receive more gains from the acquisition if the target is more socially connected to the acquirers. The value loss to the acquirer's shareholders, therefore, is not a mere transfer of wealth to the target's shareholders. Social connection between the acquirer and the target results in a reduced gain to the combined value of the two firms from the acquisition. The negative effect of social connections is significant both statistically and economically.

In interpreting these results, one should recall that our sample primarily contains mergers between large firms, because we focus on mergers between publicly traded entities with coverage in BoardEx. The results could potentially differ in acquisitions with smaller firms or

private targets, because we could expect the role of information exchange to be more important in deals involving small, opaque firms. For example, [Gompers and Xuan \(2008\)](#) focus on deals involving private, venture capital-backed targets, and they find that a connection across the acquirer and target in the form of a common venture capital investor is associated with better announcement returns. To investigate whether the effect of social ties is sensitive to size, we hand-collect data on social ties for a sample of small deals. We compile data on the directors' and executives' education and job histories based on proxy statements and news searches, and we compute social ties across acquirers and targets for a sample of 307 mergers that are ranked in SDC the smallest by the target firm's market capitalization. For this small-deal sample, we find that the effect of social connection on merger announcement returns is slightly positive but of a small magnitude that is not statistically different from zero.<sup>15</sup> This suggests that while social ties have overall negative valuation implications in mergers between larger public companies, in deals involving small or private targets where information is more likely to be scarce, the positive effect of social ties could become more relevant, at

<sup>15</sup> These results are not tabulated in the paper but are available upon request.

**Table 7**

Combined cumulative abnormal returns.

This table reports results of OLS regressions for combined cumulative abnormal returns. The dependent variable is the cumulative abnormal return over the three-day event window (CAR[−1, +1]) for the combined firm, calculated as the market value-weighted average of the CAR for the acquirer and the CAR for the target. Average Connection measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. Control variables include the total size, Q, leverage, and cash flow of the combined firm, the relative size of the acquisition, and dummy variables indicating whether the transaction is financed 100% with stock, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer. Q (leverage, cash flow) of the combined firm is calculated as the asset-weighted average of Q (leverage, cash flow) of the acquirer and Q (leverage, cash flow) of the target. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Independent variable	CAR[−1, +1]			
	(1)	(2)	(3)	(4)
Average connection	−0.053*** [0.020]	−0.075*** [0.023]	−0.051** [0.025]	−0.045* [0.026]
Log total assets		−0.005*** [0.002]	−0.004** [0.002]	−0.004*** [0.002]
Q		−0.006*** [0.002]	−0.005*** [0.002]	−0.005*** [0.002]
Debt/assets		0.022 [0.020]	0.025 [0.019]	0.018 [0.021]
Cash flow/assets		0.038 [0.032]	0.033 [0.030]	0.030 [0.033]
Relative transaction value		0.027*** [0.009]	0.029*** [0.009]	0.026*** [0.009]
Pure stock deal?		−0.022*** [0.007]	−0.017** [0.008]	−0.017** [0.008]
Related deal?		0.001 [0.007]	0.003 [0.006]	0.003 [0.007]
Tender offer?		0.017** [0.008]	0.019** [0.009]	0.017** [0.008]
Year fixed effects	No	No	Yes	Yes
Industry fixed effects	No	No	No	Yes
Number of observations	519	464	464	464
R <sup>2</sup>	0.01	0.15	0.18	0.22

least partially offsetting the negative effects that we have shown above.

#### 4. Further empirical evidence on social ties

To better understand the short-run performance results, we now consider further empirical evidence on the characteristics of the mergers and some mechanisms through which the value effect could be working. We first consider an important aspect of decision making in the merged firm: the retention of key personnel from the target and how this relates to social ties. Next, we investigate the relation between social ties and the remuneration awarded to the acquirer CEO for completing the merger deal. We then analyze how the extent of social connectedness between an acquirer and a target relates to the probability of an acquisition being announced and completed. Finally, we analyze the relation between social connections and the post-merger performance of the firm, focusing on the likelihood of the subsequent divestment of the acquired assets.

##### 4.1. Target board and target CEO retention

One avenue through which social connections could have a significant impact on merger performance is personnel decisions regarding high-level managers and directors (Harford, 2003; Hartzell, Ofek, and Yermack,

2004). The existing literature has found mixed results on the link between the market's response to a merger announcement and retention of top management from the target. For example, Martin and McConnell (1991) find no relation in either bidder or target abnormal returns, and Barger, Schlingemann, Stulz, and Zutter (2009) also find no evidence that retention of the target CEO affects target returns in mergers involving public bidders. Matsusaka (1993) finds a positive relation between bidder abnormal returns and the retention of top target management, while Wulf (2004) finds lower returns to shareholders of targets acquired in mergers-of-equals deals when there is shared governance after the merger.

We would expect a setting where acquirers and targets at merging firms share strong social connections to be one in which retention of the target CEO or other top managers or directors is less likely to be driven by motives of pure value-maximization.<sup>16</sup> We thus investigate whether social connections between the acquirer and the target affect the

<sup>16</sup> Target directors have significant incentives to be retained. Harford (2003) shows that target directors' loss of a board seat upon completion of a merger tends to have a negative financial impact and is difficult to replace. Hartzell, Ofek, and Yermack (2004) show that negotiated cash payments to target CEOs are negatively associated with target CEO retention, indicating that some target CEOs are able to use retention decisions to extract personal benefits.

**Table 8**

Target board and target CEO retention.

This table reports regression results for target board and target CEO retention. Columns 1 through 6 present Tobit regression results. The dependent variable in Columns 1 to 3 is the number of the target's pre-acquisition board of directors who remain on the board of the combined company post-acquisition as a percentage of the combined company's post-acquisition board size. The dependent variable in Columns 4 to 6 is the number of the target's pre-acquisition board of directors who remain on the board of the combined company as a percentage of the target's pre-acquisition board size. Columns 7 to 9 present logit regression results, in which the dependent variable is a dummy variable that equals one if the target's CEO remains on the board of the combined company post-acquisition and zero otherwise. Average Connection measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. Control variables include the average number of other board seats held by the target directors, the size, *Q*, leverage, cash flow, and stock performance of the target, the relative size of the acquisition, and dummy variables indicating whether the transaction is financed 100% with stock, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer. Marginal effects are reported. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Independent variable	Target board retention			Target board retention			Target CEO retention		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Average connection	0.535*** [0.093]	0.321*** [0.071]	0.334*** [0.077]	0.656*** [0.110]	0.395*** [0.082]	0.423*** [0.089]	0.384*** [0.124]	0.281** [0.109]	0.229** [0.108]
Average number of other board seats held by directors		-0.011 [0.027]	-0.014 [0.031]		-0.022 [0.035]	-0.020 [0.041]		-0.057 [0.051]	-0.076 [0.057]
Target log assets		0.023*** [0.006]	0.021*** [0.007]		0.030*** [0.008]	0.024** [0.009]		0.022** [0.010]	0.019 [0.013]
Target <i>Q</i>		-0.006 [0.006]	-0.003 [0.008]		-0.012 [0.009]	-0.003 [0.010]		0.000 [0.015]	0.018 [0.014]
Target debt/assets		-0.057 [0.049]	-0.068 [0.055]		-0.102 [0.064]	-0.106 [0.072]		-0.043 [0.085]	-0.012 [0.084]
Target cash flow/assets		-0.054 [0.052]	-0.043 [0.057]		-0.066 [0.069]	-0.040 [0.073]		-0.085 [0.076]	-0.087 [0.079]
Target stock performance		0.022 [0.022]	0.020 [0.024]		0.024 [0.028]	0.021 [0.029]		0.024 [0.038]	0.028 [0.035]
Relative transaction value		0.177*** [0.026]	0.175*** [0.024]		0.231*** [0.035]	0.234*** [0.033]		0.107*** [0.030]	0.123*** [0.030]
Pure stock deal?		0.169*** [0.021]	0.162*** [0.021]		0.213*** [0.029]	0.199*** [0.029]		0.170*** [0.048]	0.136*** [0.046]
Related deal?		0.048** [0.023]	0.049** [0.023]		0.076** [0.030]	0.073** [0.030]		0.063* [0.037]	0.044 [0.034]
Tender offer?		-0.066 [0.042]	-0.067 [0.041]		-0.092* [0.055]	-0.095* [0.055]			
Year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Industry fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Number of observations	503	458	458	503	458	458	503	458	455
R <sup>2</sup>	0.11	0.73	0.78	0.07	0.54	0.58	0.02	0.12	0.19

likelihood that members of the target firm's board of directors and the target firm's CEO remain on the board of the combined company post-acquisition as a way of shedding additional light on the announcement return evidence. We consider overall target board retention, target CEO retention, and retention of individual target board members.

For each acquisition in our sample, we check the last annual reports and proxy statements filed by the acquirer and by the target before the acquisition announcement as well as the first annual report and proxy statement filed by the acquirer after the merger completion to determine board membership pre- and post-acquisition. We then start by constructing three measures for target board and target CEO retention: the number of the target's pre-acquisition board of directors who remain on the board of the combined company post-acquisition as a percentage of the combined company's post-acquisition board size, the number of the target's pre-acquisition board of directors who remain on the board of the combined company as a percentage of the target's pre-acquisition board size, and a dummy variable indicating whether the target's CEO

remains on the board of the combined company post-acquisition.

Table 8 reports the marginal effects from regressions with one of these three retention measures as the dependent variable and the Average Connection between the acquirer and the target as the key independent variable. We use Tobit regressions to model the percentage of the target board retained (bounded by zero and one) and logit regressions to model the probability of target CEO retention.<sup>17</sup> Across all measures and specifications, the degree of social connection between the acquirer and the target is significantly positively correlated with target board and target CEO retention after the merger, and the effect remains strong after we include controls for overall director ability or reputation (proxied by the average number of other board seats held by directors), target size, *Q*, leverage, profitability, prior year stock performance, relative transaction value, transaction method of payment, relatedness of the deal, and an indicator for tender offers, as

<sup>17</sup> All results in Table 8 are robust to the use of OLS estimation.

well as year and industry fixed effects.<sup>18</sup> The target firm's CEO and a larger fraction of the target firm's pre-acquisition board of directors are significantly more likely to remain on the board of the combined firm post-acquisition if the acquiring and the target firms are highly socially connected. These effects are economically significant as well. For example, based on the Tobit regression results in Column 6, a one-standard-deviation increase in Average Connection increases the percentage of the target board retained by 5.5 percentage points, an increase equivalent to 65% of the mean. Based on the logit regression results in Column 9, a one-standard-deviation increase in Average Connection increases the probability of target CEO retention by 3.0 percentage points, an increase equivalent to 16% of the mean. Target firm size, both in absolute terms and relative to the acquirer, as well as the industry relatedness of the two firms, also increases the likelihood of target board and target CEO retention.

Next, we examine the relation between social ties and retention at the level of the individual target board member. We compute each target individual director's

connection as the percentage of directors on the acquirer's board to which the individual target director is socially connected. Table 9 presents the results of logit regressions modeling the probability of an individual target director being retained on the board of the combined firm post-merger with standard errors clustered by merger deal. Each unit of observation is an individual director of the target firm prior to the merger. The dependent variable is an indicator variable that equals one when the target director remains on the post-merger board, and the key independent variable is the individual director's connection.

In Columns 1 through 3 of Table 9, the extent of an individual target director's social connection to the acquirer's board has a significantly positive effect on the probability that this director remains on the post-merger board. The effect remains significant at the 1% level after we include controls for the individual director's ability or reputation (proxied by the number of other board seats held by the individual director), firm-level and deal-level characteristics, and year and industry fixed effects. Based on the results in Column 3, a one-standard-deviation

**Table 9**

Individual target director retention.

This table reports results of logit regressions for the probability of an individual director of the target firm being retained on the board of the combined firm post-merger. The dependent variable is a dummy variable that takes the value of one if the individual director of the target firm remains on the board of the combined firm post-merger and zero otherwise. Individual director's connection measures the percentage of the acquirer's board of directors to which the individual target director is socially connected. Average Connection measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. Control variables include the number of other board seats held by the individual director, the size, *Q*, leverage, cash flow, and stock performance of the target, the relative size of the acquisition, and dummy variables indicating whether the transaction is financed 100% with stock, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer. Marginal effects are reported. Robust standard errors clustered by deal are in brackets. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Independent variable	Individual target director retention			
	(1)	(2)	(3)	(4)
Individual director's connection	0.244*** [0.037]	0.123*** [0.025]	0.100*** [0.025]	0.052** [0.025]
Average connection				0.124** [0.049]
Number of other board seats held by individual director		0.016*** [0.005]	0.017*** [0.004]	0.017*** [0.004]
Target log assets		0.006** [0.003]	0.002 [0.003]	0.002 [0.003]
Target <i>Q</i>		0.000 [0.003]	0.003 [0.003]	0.003 [0.003]
Target debt/assets		-0.026 [0.028]	-0.021 [0.029]	-0.016 [0.029]
Target cash flow/assets		-0.044 [0.029]	-0.045* [0.027]	-0.047* [0.027]
Target stock performance		0.016 [0.013]	0.021* [0.012]	0.020* [0.012]
Relative transaction value		0.065*** [0.012]	0.070*** [0.010]	0.068*** [0.010]
Pure stock deal?		0.128*** [0.023]	0.101*** [0.021]	0.094*** [0.020]
Related deal?		0.064*** [0.011]	0.048*** [0.010]	0.048*** [0.010]
Tender offer?		-0.033* [0.018]	-0.025 [0.021]	-0.021 [0.022]
Year fixed effects	No	No	Yes	Yes
Industry fixed effects	No	No	Yes	Yes
Number of observations	3,524	3,240	3,240	3,240
R <sup>2</sup>	0.03	0.20	0.23	0.23

increase in an individual target director's social connection to the acquirer's board increases the probability that this particular director is retained by about 1.5 percentage points, which represents 14% of the mean. We also see that the individual director's ability or reputation significantly increases the probability of retention. In Column 4, in addition to the control variables and year and industry fixed effects, we include the Average Connection between the acquiring and the target firms as an explanatory variable. Consistent with the results in Table 8, the coefficient on Average Connection is positive and highly significant, but more interestingly, the positive coefficient on individual director's connection remains significant at the 5% level. This indicates that the overall connections between the acquiring and the target firms at the deal level increase an individual target director's probability of retention. But, even after accounting for this effect, an individual target director's own connections to the acquirer significantly increase his or her probability of remaining on the board. In other words, it is precisely those individual target directors who are the most connected to the acquirer that are retained on the post-merger board of the combined firm.

Overall, our results suggest that the extent of social ties between the acquirer and the target is an important determinant of target CEO and target board retention in an acquisition. Inefficient retention of the CEO or other top managers and directors on the basis of social connections could be one source of value destruction in mergers between highly socially connected firms.

#### 4.2. Acquirer CEO bonus upon merger completion

Next, we examine the relation between social connections and the remuneration awarded to the acquirer CEO for completing the merger deal (Grinstein and Hribar, 2004; Harford and Li, 2007). If acquirer CEO compensation partially reflects the board's inclination to complete a deal with a highly socially connected target, then we might expect to see a positive association between our measure of social connections and CEO compensation related to the merger deal. Grinstein and Hribar (2004) find that CEO compensation provided for completion of a merger deal is almost always in the form of a cash bonus, and we, therefore, focus on bonuses awarded to the acquirer CEO in the year of completion of the merger.<sup>19</sup> We collect data on acquirer CEO bonuses in the year of completion of the merger deal from ExecuComp and acquirer proxy statements, including the amount of the bonus and the reason for awarding the bonus.<sup>20</sup> We first examine whether the degree of social connection between the

acquirer and the target affects the size of the bonus the acquirer CEO receives upon merger completion. We then investigate whether acquirer CEOs are more likely to be explicitly rewarded for completing transactions with target firms that are highly socially connected to the acquiring firms.

Table 10 reports results of these analyses, with Average Connection as the primary independent variable of interest. Columns 1 to 3 present estimates from OLS regressions in which the dependent variable is the bonus (in millions of dollars) awarded to the acquirer CEO in the year of merger completion. Consistent with Grinstein and Hribar (2004), we find that acquirer CEO bonuses are significantly positively related to firm size, profitability, and the relative size of the acquisition. Controlling for these factors and other firm- and deal-level characteristics, we see a positive and significant relation between average acquirer-target connection and the bonuses awarded to the acquirer CEO upon completion of the merger deal. For example, the estimates in Column 2 suggest that a one-standard-deviation increase in Average Connection is associated with a \$0.4 million increase in CEO bonus, which is 33% of the average bonus in our sample.

In Columns 4 to 6, we present estimates from logit regressions in which the dependent variable is a dummy variable that equals one if the completion of the deal is cited as a reason in the proxy statement for awarding the bonus to the acquirer CEO. Similar to the results on the size of the bonus, we find that an acquirer CEO is significantly more likely to be explicitly rewarded for completing a deal with a target firm that is highly socially connected to the acquiring firm even after controlling for firm and deal characteristics and year and industry fixed effects. Based on the specification in Column 6, a one-standard-deviation increase in Average Connection is associated with an increase in the probability that the CEO receives a bonus for completing the deal of 7.3 percentage points, which is 35% of the mean in our sample. Together, these results illustrate that, despite the negative market reaction to the merger announcement, CEOs of acquiring firms that have strong social connections to the targets are rewarded for completion of the deals. These CEOs are thus more incentivized to engage in merger transactions with targets with which acquirer-target social connections are strong, regardless of whether these mergers make sense strategically or intrinsically.

#### 4.3. Probability of acquisition

In addition to their effect on acquirer CEO compensation and the retention of top management post-merger, the presence of social ties between directors and executives of an acquirer and a target could have an impact on the probability of a merger occurring in the first place. Indeed, we could expect such an effect given the evidence above about acquirer CEO incentives. Thus, we examine whether an acquisition is more likely to occur between two firms that have a high degree of social connection. The first row of Table 11 reports the Average Connection between the acquirers and the targets in our sample, which measures the percentage of socially connected pairs across the directors and top executives of the acquirer and

<sup>18</sup> The tender offer dummy is dropped from the target CEO retention regressions in Columns 8 and 9, because it perfectly predicts non-retention, i.e., in every tender offer in our sample, the target CEO is not retained.

<sup>19</sup> Grinstein and Hribar (2004) find that the remuneration awarded to the acquirer CEO for completing the merger deal is in the form of a cash bonus in 97% of the cases and that in more than 90% of these cases no other form of compensation related to the deal is provided to the CEO.

<sup>20</sup> Firms are required by the Securities and Exchange Commission (SEC) to disclose and discuss the measures on which the CEO bonus is based in the proxy statements.

**Table 10**

Acquirer CEO bonus.

This table reports regression results for acquirer CEO bonus in the year of the deal. Columns 1 through 3 present estimates from OLS regressions, where the dependent variable is the bonus (in millions of dollars) awarded to the acquirer CEO in the year of merger completion. Columns 4 through 6 present estimates from logit regressions (with marginal effects reported), where the dependent variable is a dummy variable that equals one if the completion of the deal is cited as a reason in the proxy statement for awarding the bonus to the acquirer CEO. Average Connection measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. Control variables include the size, *Q*, leverage, cash flow, and stock performance of the acquirer, the relative size of the acquisition, and dummy variables indicating whether the transaction is financed 100% with stock, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Independent variable	Acquirer CEO bonus			Bonus for merger?		
	(1)	(2)	(3)	(4)	(5)	(6)
Average connection	3.719** [1.459]	2.995** [1.279]	1.815 [1.148]	0.720*** [0.251]	0.579** [0.241]	0.562** [0.225]
Acquirer log assets		0.444*** [0.081]	0.434*** [0.080]		0.042*** [0.012]	0.041*** [0.014]
Acquirer <i>Q</i>		0.046 [0.043]	0.044 [0.053]		0.019 [0.014]	0.019 [0.017]
Acquirer debt/assets		0.64 [0.576]	0.427 [0.660]		0.013 [0.135]	-0.002 [0.151]
Acquirer cash flow/assets		1.994** [0.858]	2.029* [1.147]		0.245 [0.267]	0.178 [0.301]
Acquirer stock performance		0.460* [0.273]	0.351 [0.251]		-0.014 [0.066]	-0.011 [0.063]
Relative transaction value		0.532** [0.269]	0.496* [0.254]		0.141*** [0.044]	0.119*** [0.044]
Pure stock deal?		0.655* [0.345]	0.431 [0.344]		0.027 [0.060]	0.023 [0.064]
Related deal?		-0.219 [0.221]	-0.330 [0.275]		0.030 [0.047]	0.020 [0.053]
Tender offer?		0.293 [0.240]	0.331 [0.253]		0.213** [0.089]	0.226** [0.103]
Year fixed effects	No	No	Yes	No	No	Yes
Industry fixed effects	No	No	Yes	No	No	Yes
Number of observations	413	392	392	413	392	389
<i>R</i> <sup>2</sup>	0.04	0.19	0.28	0.04	0.09	0.14

**Table 11**

Probability of acquisition.

This table examines whether an acquisition is more likely to occur between two firms that have a high degree of social connection between them. The first row reports the Average Connection between the acquirers and the targets in our sample, which measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. Row 2 reports the Average Connection between sample acquirers and random targets, which we construct by pairing each sample acquirer with a random firm drawn from the sample target's industry in the year of the acquisition and repeating the procedure five hundred times. Row 3 reports the Average Connection between random acquirers and sample targets, which we construct by pairing each sample target with a random firm drawn from the sample acquirer's industry in the year of the acquisition and repeating the procedure five hundred times. Row 4 reports the Average Connection between random acquirers and random targets, which we construct by drawing one random firm from the acquirer's industry and one random firm from the target's industry in the year of the acquisition for each acquisition in our sample, and repeating the procedure five hundred times. Row 5 reports the Average Connection between acquirers and targets in deals that are announced but are not completed. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Average connection	Mean (%)	Difference from Row (1)
Average connection between acquirers and targets in the sample	(1) 10.60	
Average connection between		
Sample acquirers and random targets	(2) 4.63	***
Random acquirers and sample targets	(3) 3.94	***
Random acquirers and random targets	(4) 4.08	***
Acquirers and targets in non-completed deals	(5) 7.27	***

the target. This measure of 10.60% represents the average degree of social connection between the acquirers and the targets we observe in our sample.

For each acquisition in our sample, we pair the sample acquirer with a random firm drawn from the sample

target's industry in the year of the acquisition. We repeat the procedure five hundred times and report the Average Connection calculated for these simulated pairings in Row 2. Similarly, Row 3 of Table 11 reports the Average Connection between random acquirers and sample targets,



which we construct by pairing each sample target with a random firm drawn from the sample acquirer's industry in the year of the acquisition and repeating the procedure five hundred times. Row 4 reports the Average Connection between random acquirers and random targets, which we construct by drawing one random firm from the acquirer's industry and one random firm from the target's industry in the year of the acquisition for each acquisition in our sample and repeating the procedure five hundred times. Rows 2, 3, and 4 can be thought of as the expected average connection between a potential acquirer and a potential target if the pairing of the two firms occurs randomly. These results show that the observed degree of social connection between actual acquirers and targets is more than twice as high as what one would expect from randomly pairing up potential acquirers with potential targets.

Finally, Row 5 reports the Average Connection between acquirers and targets in deals that are announced but eventually not completed.<sup>21</sup> The degree of social connection between acquirers and targets in non-completed deals (7.27%) is higher than that between randomly paired firms but is again significantly lower than that between acquirers and targets in our sample of completed deals. Together, the results in Table 11 show the monotonically increasing degree of social connection across acquirers and targets in hypothetical random pairings, in actual deals that were announced but not completed, and in actual deals that were completed. This pattern indicates that acquisitions are more likely to occur between highly connected firms, and conditional on being announced, they are more likely to be completed between two firms that are well connected to each other through social ties.

The results on the probability of acquisition are consistent with the notion that considerable social connections could result in a lowering of due diligence standards or an inclination to forgo opportunities outside of the social network and are consistent with the evidence that social ties are associated with higher acquirer CEO bonuses in the year of merger completion. The fact that mergers are more likely to take place in the presence of social connections could also be explained by the hypothesis that social connections mitigate informational asymmetries by enhancing the flow of information. However, this hypothesis is inconsistent with the announcement return results showing that, instead of improving merger performance, social ties are associated with lower value creation in mergers. We also find that amongst deals with negative acquirer announcement returns, the degree of social connection is significantly stronger in completed than non-completed deals, with the mean Average Connection for completed deals and non-completed deals at 11.5% and 6.8%, respectively. This is consistent with the intuition that acquirers are less likely to pull out of non-value-maximizing deals that have poor market reactions when

they are highly socially connected to the target. Next, we turn to post-acquisition performance for further evidence.

#### 4.4. Post-merger performance

If social ties lead an acquirer and a target to be more likely to merge despite negative valuation effects, then we could expect these acquisitions to be associated with worse post-merger performance. In this section, we investigate whether and how social connections between the acquirer and the target at the time of the acquisition are linked to acquisition success by studying the operating performance of the merged firm as well as the likelihood of the subsequent divestment of the acquired assets.

We first examine changes in the operation and performance measures of the merged firm one year after the acquisition, compared with the asset-weighted averages of similar measures in the acquirer and the target one year before the acquisitions. Studies in the existing literature using accounting-based measures to evaluate merger success yield mixed results.<sup>22</sup> The lack of clear-cut findings is likely due to the possibility that accounting data are too noisy to isolate the effects of mergers, especially when saddled with complications associated with acquisitions such as restatements, write-downs, special depreciation or amortization, and merger costs (Kaplan, 2006). We find that higher social connections between the acquirer and the target at the time of the acquisition are associated with a slightly bigger drop in return on assets (raw or industry-adjusted). In addition, compared with those involved in low-connection transactions, firms that have undertaken high-connection acquisitions experience a larger decrease in *Q* and a smaller reduction in the total number of employees. These differences, however, are noisy and are not statistically significant.

An alternative and arguably cleaner and more direct way to evaluate merger success is to follow acquisitions in time and see whether they are divested subsequently (Ravenscraft and Scherer, 1987; Porter, 1987) and, in particular, whether the divested acquisitions are considered failures from an ex post perspective (Kaplan and Weisbach, 1992). For each acquirer in our sample, we obtain from SDC a list of all the divestures it has conducted since the completion of the acquisition. We then determine whether each divestiture is related to the assets acquired in the merger by examining the company annual reports and filings and using Factiva news searches. For divested acquisitions, we classify them as unsuccessful if the stated reason for the divestiture is unsatisfactory performance or if the divestiture reports a loss on sale of the assets.<sup>23</sup>

In Table 12, we use logit regressions to examine the effect of social connections between the acquirer and the target at the time of the acquisition on the likelihood of a

<sup>21</sup> We obtain from SDC all non-completed merger transactions and merge with the BoardEx database to arrive at a sample of 81 non-completed deals for which we can calculate the Average Connection between the acquirer and the target using the education and employment histories of the directors and executives.

<sup>22</sup> See, for example, Healy, Palepu, and Ruback (1992), Kaplan and Weisbach (1992), and Maksimovic and Phillips (2001), among others. Kaplan (2006) provides an overview.

<sup>23</sup> The reason for the divestiture is considered performance-related if, for example, the acquisition is reported to have been unprofitable or a mistake. Other, non-performance-related reasons for divesting assets include antitrust, change in corporate strategy, good price, and financing-related, as defined in Kaplan and Weisbach (1992).

**Table 12**

Probability of subsequent divestiture.

This table reports results of logit regressions for the probability of divesting an acquisition. The dependent variable in Columns 1 to 3 is a dummy variable that takes the value of one if the acquisition has been divested by the acquirer and zero otherwise. The dependent variable in Columns 4 to 6 is a dummy variable that takes the value of one if the acquisition has been divested by the acquirer and the divestiture reports a loss on the sale or is performance-related. Average Connection measures the percentage of socially connected pairs across the directors and top executives of the acquirer and the target. Each pair consists of one member from the acquirer and one member from the target, and social connection is defined based on all ties across all the directors and top executives of the acquirer and the target. Control variables include the total size,  $Q$ , leverage, and cash flow of the combined firm, the relative size of the acquisition, and dummy variables indicating whether the transaction is financed 100% with stock, whether the acquirer and the target are in related industries, and whether the transaction is a tender offer.  $Q$  (leverage, cash flow) of the combined firm is calculated as the asset-weighted average of  $Q$  (leverage, cash flow) of the acquirer and  $Q$  (leverage, cash flow) of the target. Marginal effects are reported. Robust standard errors are in brackets. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) level.

Independent variable	Acquisition divested?			Acquisition divested and unsuccessful?		
	(1)	(2)	(3)	(4)	(5)	(6)
Average connection	0.277*** [0.103]	0.349*** [0.131]	0.282** [0.111]	0.107*** [0.039]	0.125*** [0.036]	0.069*** [0.018]
Log total assets		0.035*** [0.009]	0.035*** [0.010]		–0.004 [0.003]	–0.001 [0.002]
$Q$		–0.006 [0.013]	0.003 [0.013]		–0.004 [0.004]	–0.000 [0.002]
Debt/assets		0.099 [0.104]	0.055 [0.098]		0.082** [0.038]	0.029 [0.019]
Cash flow/assets		0.274 [0.234]	0.122 [0.228]		–0.028 [0.069]	–0.038 [0.032]
Relative transaction value		0.032 [0.030]	0.025 [0.034]		–0.054** [0.021]	–0.023*** [0.008]
Pure stock deal?		0.062 [0.044]	0.040 [0.040]		–0.013 [0.014]	–0.006 [0.006]
Related deal?		–0.024 [0.038]	–0.015 [0.038]		0.016 [0.014]	0.008 [0.007]
Tender offer?		0.029 [0.067]	0.056 [0.076]		0.050 [0.039]	0.030 [0.023]
Year fixed effects	No	No	Yes	No	No	Yes
Industry fixed effects	No	No	Yes	No	No	Yes
Number of observations	539	472	472	539	472	472
$R^2$	0.02	0.08	0.16	0.03	0.13	0.24

subsequent divestiture of the acquired assets. The dependent variable in Columns 1 to 3 is a dummy variable that takes the value of one if the acquisition has been divested by the acquirer and zero otherwise. The dependent variable in Columns 4 to 6 is a dummy variable that takes the value of one if the acquisition has been divested by the acquirer and the divestiture reports a loss on the sale or is performance-related. The coefficient estimates on Average Connection indicate that social ties between the acquirer and the target are an important determinant of the probability that the acquisition is subsequently divested and the probability that the divested acquisition is considered a failure. In other words, acquisitions that are considered unsuccessful ex post are significantly more likely to have occurred between firms with higher social connections.

Thus, while firms are more likely to merge together in the presence of strong social connections, the fact that they are also more likely to subsequently divest the acquisition for performance-related reasons could indicate that the merger was recognized ex post as a bad decision.

#### 4.5. Discussion

Our results thus far establish a significantly negative relation between social connections and announcement

returns as well as robust relations between social connections and various decisions and features of the mergers (target board and CEO retention, acquirer CEO bonuses for merger completion, and acquisition divestiture). It is useful to attempt to relate the announcement returns directly to these actions and merger characteristics to determine whether these merger features explain all or perhaps only part of the market's reaction to socially connected deals. In a fully econometrically specified model, one would expect the effect of social connections on announcement returns to be eliminated, as social connections should not by themselves constitute something negative. Instead, it is the decision making associated with social connections that we expect to lead to the undesirable effects.

In untabulated results, we find that the three-day cumulative abnormal return to the acquirer is significantly related to the percentage of the target board retained in the post-acquisition company, target CEO retention, acquirer CEO bonus for completing a merger, and acquisition divestiture in the future.<sup>24</sup> When we add these variables to our baseline announcement return regression

<sup>24</sup> An  $F$ -test for the joint significance of these four variables in explaining acquirer announcement returns yields an  $F$ -statistic of 4.87 with significance at the 1% level.

(Column 4 of Table 5) along with our Average Connection measure and all other control variables and fixed effects, we find that the coefficient on Average Connection remains negative but drops in magnitude by approximately 40%. However, neither Average Connection nor any of the four added variables are statistically significant. The standard errors become larger in this augmented regression, likely due to the smaller sample size and the correlations across the added right-hand-side variables and Average Connection, making it difficult to identify any effects with statistical precision.

The fact that the magnitude of the coefficient on Average Connection drops substantially and becomes insignificant is consistent with the interpretation that the avenues of decision making and features of the mergers on which we focus explain some of the valuation effect. However, caution in the interpretation is warranted, because of the loss of sample size and correlations across right-hand-side variables. It is likely that other unobserved features of decision making in socially connected mergers (e.g., operational decisions post-merger) are responsible for at least part of the valuation effects that we find.

## 5. Conclusion

Social ties have been demonstrated to have an impact on a variety of types of economic activity, and a small but growing literature addresses the corporate finance implications of social ties. This paper contributes to a part of that literature that has received relatively less attention: the effect of social connections across instead of within firms. We investigate the impact of social ties on merger performance, focusing on cross-firm ties between directors and senior executives of the acquirer and target. Using data on educational background and past employment, we measure the extent of social connections between the acquirer and target based on the percentage of socially connected pairs, in which each pair consists of one individual from the acquirer and one individual from the target.

Our results show that more extensive social connections between an acquirer and a target have a negative impact on short-run merger performance. We find that acquirer announcement returns are significantly lower in the presence of social ties. A one-standard deviation increase in the extent of connection decreases the three-day cumulative abnormal return associated with the acquisition announcement by about one percentage point. These results are confirmed in both univariate comparisons and regressions controlling for a variety of firm and deal characteristics. The acquirer announcement return effect does not appear to be explained purely by transfers to the target, as we find no robust evidence of a significant relation between social ties and target announcement returns. The effect of social ties on the acquirer- and target-weighted average announcement return is found to be significantly negative.

Moreover, our results indicate that acquirer-target social ties significantly increase the likelihood that the target firm's CEO and a larger fraction of the target firm's pre-acquisition board of directors remain on the board of

the combined firm after the merger. An individual target director's connections to the acquirer's directors and senior executives also increase the probability that that target director is retained on the post-merger board. Our results also show that social connections between the target and acquirer significantly increase the acquirer CEO's bonus awarded for completion of the merger deal. We further find that acquisitions are more likely to occur between two firms that are well connected to each other through social ties and that these acquisitions are subsequently more likely to be divested for performance-related reasons.

This paper demonstrates the impact of cross-firm social ties in the context of one particularly important type of corporate decision: mergers and acquisitions. Mergers also represent a type of corporate event in which connections across firms are likely to be especially relevant because of the interactive nature of the negotiation and decision-making process involved. Overall, the evidence in the paper suggests that, in mergers involving large, public firms, social ties between the acquirer and the target are associated with lower value creation for shareholders as a whole and is consistent with the view that the negative effects of social networks on decision making in mergers outweigh any positive information-based effects that could be present.

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