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The role of investment banker directors in M&A

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Abstract

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The role of investment banker directors in M&A[☆]

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ABSTRACT

We examine how directors with investment banking experience affect firms' acquisition behavior. We find that firms with investment bankers on the board have a higher probability of making acquisitions. Furthermore, acquirers with investment banker directors experience higher announcement returns, pay lower takeover premiums and advisory fees, and exhibit superior long-run performance. Overall, our results suggest that directors with investment banking experience help firms make better acquisitions, both by identifying suitable targets and reducing the cost of the deals.

Keywords: Mergers and Acquisitions; Board of Directors; Investment Banking Experience
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1. Introduction

Mergers and acquisitions (M&A) represent a large portion of U.S. firms' overall investments, totaling $1.24 trillion in 2008. The board of directors plays an important advisory role in these acquisitions and other major corporate decisions. Toward that end, recent regulations focus on board composition and call for directors with more financial expertise.

In this study, we examine the influence of directors with investment banking (IB) experience on firms' acquisitions behavior. We conjecture that directors with IB experience improve the acquisition making process, thereby enhancing firm value. However, based on a sample of 282 large firms during 1988-2001, Güner, Malmendier, and Tate (2008) find that the presence of investment bankers on boards is associated with *worse* acquisitions. The authors attribute this relation to the conflict of interests arising from such directors' concurrent affiliation with the investment bank involved in the takeover process.

We revisit the role of IB directors in mergers and acquisitions with two main innovations. First, we use a more recent and comprehensive sample of individual directors' employment history to identify IB directors who once held senior positions at one of the top M&A advising firms. Second, unlike Güner, Malmendier, and Tate (2008), who examine IB directors' advisory role and potential conflicts of interests simultaneously, we seek to examine the advisory role separately by focusing on IB directors that are largely free of potential conflicts of interests. In that sense, we present a complimentary perspective to that of Güner, Malmendier, and Tate.

We conjecture that IB directors use their expertise and network to improve a firm's acquisition decisions in two ways. First, IB directors might improve the screening of target candidates. On the one hand, they might assist in identifying suitable targets that otherwise would not have been pursued, in which case the probability of making acquisitions would increase with the presence of IB directors. On the other hand, they might assist the firm in dodging value-destroying acquisitions, in which case the probability of making acquisitions would decrease with the presence of IB directors. These alternatives are not mutually exclusive, and both effects might be at work simultaneously, in which case the

acquisition probability could be unrelated to the presence of IB directors. Second, IB directors might assist acquirers in negotiating better acquisition terms and reducing advising fees.

We start our analysis by identifying IB directors for a large set of U.S. public firms. IB directors are defined as outside directors who have past or concurrent working experience as either top executives or senior managers at one of the most active M&A advising firms. Using a sample of 41,393 firm-year observations from 1998 to 2008, we document a positive relation between the presence of IB directors and the firms' probability of making acquisitions. *Ceteris paribus*, firms with IB directors on the board are 13.6% more likely to make acquisitions in the following year, suggesting that IB directors help firms identify more targets.

A potential concern for the interpretations of the results is the endogeneity of board composition, as pointed out by Hermalin and Weisbach (1998, 2003). In our context, it is possible that firms appoint directors with investment banking experience in anticipation of acquisition activities. If so, the observed positive effect of IB directors on acquisition likelihood might stem from reverse causality. We use three different methods to address this concern. First, we adopt an instrumental variable (IV) approach. Our first instrument exploits cross-sectional variation, i.e., investment bankers' tendency to sit on boards of firms that are geographically proximate. Our second instrument exploits time series variation, i.e., the need for some firms to appoint financial experts to their board in response to the Sarbanes-Oxley Act of 2002 (SOX). We find similar results using the instrumental variable approach. Second, we remove observations that are relatively prone to endogeneity bias, such as cases in which an IB director's tenure on a board is less than three years. Our results remain robust. Finally, we conduct a difference-in-difference analysis using SOX as an exogeneous shock to firms' IB director presence. Again, we find that the presence of IB directors has a positive effect on firms' acquisition probability. Overall, our results suggest that the effect of IB directors on firms' acquisition propensity is causal.

Next, we examine whether acquirers with IB directors who are unlikely to suffer from conflicts of interest make better acquisitions. Using a sample of 2,465 acquisitions announced during 1999-2008, we find that acquiring firms with IB directors experience significantly higher abnormal stock returns around

the acquisition announcements. After controlling for a variety of firm and deal characteristics, we find that acquirers with IB directors are associated with 0.8% higher abnormal announcement returns. This translates into $36 million in enhanced shareholder value for the average-sized acquirer in our sample. We further show that IB directors' effect is more pronounced when (i) the relative deal size is larger, (ii) at least one of the IB directors on the acquirer's board holds a concurrent senior position at an investment bank, and (iii) the CEOs have short tenure in the bidder's industry. These results suggest that IB directors are especially valuable when the deal is economically more significant to the acquirer, when the director is concurrently affiliated with an investment bank, and when the acquirer CEO is less experienced.

The more favorable market reaction toward acquisitions by firms with IB directors is consistent with our conjecture that directors' investment banking experience helps firms make better acquisition decisions. We next investigate the source of the value gains by examining target premiums, advisory fees paid by acquirers, and acquirers' long-run operating performance. We find that the presence of IB directors is associated with a significantly lower takeover premium when the relative size of the target is large, lending support to the view that IB directors assist in determining and/or negotiating the takeover price in economically important deals. We also find that acquirers with IB directors pay lower advisory fees, suggesting that IB directors assist in negotiating advisory fees and/or help reduce the firm's reliance on outside advisory services in making acquisitions. Finally, we find that the presence of IB directors is positively related to the operating performance of the firm in the long-run. Taken together, our results suggest that IB directors help firms identify better targets and negotiate better deals.

This study contributes to the literature by providing new insights on the influence of financial experts on corporate policies. A large body of research has found evidence that directors with financial expertise can offer more vigilant monitoring (McMullen and Raghunandan, 1996; Xie, Davidson, and DaDalt, 2003; Agrawal and Chadha, 2005; Abbott, Parker, and Peters, 2004; Defond, Hann, and Hu,

2005), but the evidence on the advisory role of these directors is mixed.[1] Güner, Malmendier, and Tate (2008) show that bank executives serving on other public firms' boards can affect corporate decisions, but sometimes to benefit themselves rather than the firm. We add to their study by showing that directors with investment banking expertise generally benefit shareholders in M&A activities when they are free from conflicts of interest.

Our analysis also complements a large body of literature that relates corporate governance to a firm's acquisition decision, with particular attention to the impact of board independence and board size on acquisition performance (Byrd and Hickman, 1992, Cotter, Shivdasani, and Zenner, 1997, Harford, 2003, Moeller, 2005, Masulis, Wang, and Xie, 2007). More importantly, our study adds to a growing body of research that analyzes the effects of directors with specific attributes. Masulis and Mobbs (2011) find that firms with inside directors holding outside directorships make better acquisition decisions. Fahlenbrach, Low, and Stulz (2010) document that CEO directors have no impact on firms' acquisition performance. Our analysis reveals that directors' current and past professional experience is valuable to shareholders in the context of acquisitions.

The remainder of the paper is structured as follows. Section 2 discusses the data collection and provides descriptive statistics. Section 3 presents empirical results for the relation between the presence of IB directors and firms' acquisition propensity. Section 4 presents empirical evidence on the impact of IB directors on firms' acquisition performance. Section 5 explores the sources of acquisition value gains. Section 6 concludes.

2. Data and variables

The data in this study are collected from multiple sources. We start with all U.S. publicly traded firms in the years 1998–2008 from CRSP. To obtain directors' background information, we merge the sample with the BoardEx database, which provides extensive biographical information, such as

[1] Dionne and Triki (2005) find that financially educated directors encourage corporate hedging. Minton, Taillard, and Williamson (2011) find that financial experts on banks' board of directors failed to alleviate the effect of the recent financial crisis.

employment history and educational background, of corporate directors and senior executives in major public firms. To ensure the quality of the data integration procedure, we manually check all matches and make necessary adjustments. For example, the same firm might be assigned different identifiers in BoardEx, because BoardEx collects individuals' biographical information from various public sources that sometimes use different spellings or abbreviations. We go through the BoardEx database to make sure that each firm is associated with a unique identifier. Our matching procedure yields a sample of 8,007 unique public firms, of which 1,128 financial and utility firms are eliminated. This initial sample corresponds to 41,393 firm-year observations.

To identify directors with investment banking experience, we first aggregate the deal values of U.S. mergers and acquisitions for investment bank advisers from 1980 to 2008. We then merge these M&A advising firms with the BoardEx data and compile a list of the 100 most active investment banks. A director serving on the board of a public firm in our sample is identified as an IB director if she, at some point in her career, held a senior position at any of these 100 investment banks. A senior position is defined as a top executive position (e.g., CEO, CFO, Chairman or President) or a senior manager position (e.g., managing director, Regional CEO, Regional CFO, or executive president). Junior job titles, including *division VP, analyst, associate,* and *consultant,* are not included. Table 1 provides a list of the ten most active M&A advisors by aggregate deal value and number of connected directors at public firms with whom they once shared an employment relation. As expected, there is a large overlap between the two lists.

Table 2 presents summary statistics for the 41,393 firm-year observations. Panel A reports the presence of IB directors by year. The proportion of firms appointing IB directors to the board increases monotonically over time. For example, while 17.3% of the firms have at least one IB director on the board in 1998, the ratio increases to 29.7% in 2008. On average, 24% of the firm-year observations have at least one IB director on board. Panel B describes the presence of IB directors by industry. Our sample covers ten out of the twelve Fama-French industries excluding financial and utility firms. The Consumer Nondurables industry has the highest ratio of IB directors on their board (33.0%), followed by the

Telephone and Television industry (31.5%). Panel C presents the mean and median values of some key firm characteristics for two subsamples of firms partitioned by the presence of IB directors. Detailed definitions of the variables are given in the Appendix. All continuous variables are winsorized at their 1st and 99th percentiles to reduce the influence of outliers, and all dollar values are adjusted to 2009 dollars. We observe that firms in the two subgroups have different firm characteristics. For example, firms with IB directors are larger, have lower market-to-book ratio, and have higher cash holdings than firms without IB directors.

To examine the influence of IB directors on a firm's acquisition decisions, we collect deal information from SDC's M&A database. We exclude all transactions labeled as spinoffs, recapitalizations, self-tender offers, exchange offers, repurchases, minority stake purchases, acquisitions of remaining interest, or privatizations. We further require a minimum deal value of $1 million and that the acquirer possesses more than 95% of the target's stock after the transaction. This procedure yields a total of 2,057 firm-years with at least one acquisition. We obtain financial information from COMPUSTAT and stock returns from CRSP. For several supplementary tests, we further require CEO information from ExecuComp and governance characteristics from RiskMetrics.

3. IB Directors and the probability of making acquisitions

3.1. Baseline results

To explore the impact of IB directors on a firm's acquisition activities, we first investigate whether IB directors affect firms' likelihood of making acquisitions. Table 3 reports the number and percent of firms that make at least one acquisition in a year for two subsamples based on the presence of IB directors. For nine of the ten years, the percentage of firms making acquisitions is significantly higher in the subsample of firms with IB directors. On average, 6.81% of firms with IB directors make at least one acquisition per year, compared with 4.95% of firms in the other group. These univariate results suggest that the presence of IB directors increases a firm's acquisition likelihood by about 37.6%, which is both statistically and economically significant.

We next conduct the analysis in a multivariate setting. In particular, we estimate a probit regression in which the dependent variable takes the value of one if a firm announces at least one acquisition in the year and zero otherwise. The primary variable of interest is an indicator variable (*IB Director*) that equals one if the firm has an IB director in the previous year and zero otherwise. In addition, we control for a number of other known determinants of a firm's acquisition likelihood, including firm size, market-to-book ratio, leverage, previous acquisition experience, cash, sales growth, noncash working capital, price-to-earnings ratio, average abnormal stock return, as well as calendar year and industry fixed effects (Asquity, Bruner, and Mullins, 1983, Harford, 1999).

Model 4.1 in Panel A of Table 4 presents the results of the probit regression. The estimated coefficients of the control variables all exhibit the expected signs. Firms with higher abnormal stock returns, higher sales growth, higher market-to-book ratio, or larger asset base are more likely to make acquisitions. Turning to our variable of interest, we find that the coefficient on the *IB Director* dummy is 0.057 and it is statistically different from zero at the 1% significance level. The effect on the acquisition likelihood is also economically meaningful. *Ceteris paribus*, firms with IB directors on the board are 13.6% more likely to make an acquisition than other firms.[2] To put the magnitude of increase in perspective, the marginal effect of having IB directors on a board is about as large as the marginal impact of one standard deviation increase in a firm's prior year average daily abnormal stock returns.

Prior research has shown that CEO and board characteristics have significant effects on firms' acquisition policy (Lewellen, Loderer, and Rosenfeld, 1985, Cotter, Shivdasani, and Zenner, 1997, Bertrand and Schoar, 2003, and Yim, 2013). We therefore add CEO and board variables and conduct a similar analysis on a subsample for which we have information available from ExecuComp and RiskMetrics. The results are presented in Model 4.2. Due to data availability, the sample size is

[2] We also examine whether our results are affected by differences in firm characteristics between firms with and without IB directors using a propensity score matching approach (Rosenbaum and Rubin, 1983). We estimate the propensity score using a set of covariates that includes size, market-to-book, leverage, cash, sales growth, noncash working capital, PE ratio, average abnormal return, and firm industry, and then identify two groups of firms that are virtually indistinguishable from one another except for the presence of IB directors on board. Our results are the same after adjusting for covariate differences between the two groups.

substantially reduced. We find a negative relation between CEO age and acquisition propensity. More importantly, the coefficient on *IB Director* remains positive and statistically significant at the 5% level. For an average firm in this subsample, the estimated coefficient translates to a 19.4% increase in acquisition likelihood when it has an IB director on board. This impact is comparable to the marginal effect of a one-and-a-half standard deviation increase in average abnormal stock returns.

3.2. Identification concerns

While our results are consistent with the hypothesis that IB directors help firms identify more targets, a potential concern is endogeneity due to selection bias. This problem emerges when IB directors are not randomly distributed among firms and the presence of IB directors is related to firms' demand for financial expertise. Consider a firm with plans to grow through acquisitions. Realizing the complexity of M&A transactions, the firm appoints an expert, such as an IB director, to its board to facilitate those planned acquisitions. If this is a common occurrence, the observed positive association between the presence of IB directors and the firms' propensity to make acquisitions at least partially stems from reverse causality.

To address the potential endogeneity concern, we first adopt an instrumental variable approach. However, when the endogenous regressor is binary, using the predicted probability from a nonlinear model in the second stage does not generate consistent estimates unless the nonlinear model is exactly correct (Angrist, 2001, Angrist and Krueger, 2001). Therefore, we estimate a recursive bivariate probit model, which assumes that the binary dependent and independent variables are each determined by latent linear models with jointly normal error terms (Evans and Schwab, 1995). In this model, the probit equations on *IB Director* dummy and acquisition dummy are estimated simultaneously using the maximum likelihood method, where instrumental variables are used in the estimation model of IB directors' presence.[3]

[3] In our current setting, the latent linear model can be specified as follows:

We construct two instrumental variables, one of which exploits cross-sectional variation, whereas the other exploits time series variation. The first instrument is firms' geographic location. Because geographic proximity increases the chance for firms' executives and investment bankers to interact socially and decreases the personal cost (primarily travel time) for investment bankers to serve on boards, we expect firms located in states close to financial centers to have more IB directors. The second instrument utilizes SOX's requirement that corporate boards have financial experts.[4] According to the SEC's final rule issued in January 2003, top managers in major investment banks should fall within the definition of "financial expert."[5] We therefore expect the presence of IB directors to be more common after SOX. We also include other variables that could affect a firm's decision to appoint IBs to the board in the probit regression on *IB Director* dummy, such as board size and recent securities offerings.

The recursive bivariate probit results are reported in Models 4.3 and 4.4 in Table 4 Panel A. For brevity, we only present the results from the acquisition likelihood regression, and merely note that both the SOX dummy and the location variable are positively related to firms' likelihood of having an IB director on board and are therefore valid instruments. In Model 4.3, we present the estimates of the bivariate probit model for the whole sample. The estimated coefficient on the *IB Director* variable is positive and significant at the 1% level. The inferred marginal effect of having IB directors based on the recursive bivariate probit regression, however, requires further calculation. In particular, we need to calculate the average change in the conditional probability of making acquisition separately for firms with

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$$\begin{cases} y_1^* = \beta_1 X_1 + \varepsilon_1,\ y_1 = 1 \ \text{for}\ y_1^* > 0 \\ y_2^* = \beta_2 X_2 + \gamma y_1^* + \varepsilon_2,\ y_2 = 1 \ \text{for}\ y_2^* > 0 \end{cases}$$

where y_1 and y_2 represent the presence of IB directors and acquisition activities, respectively. When the error terms ε_1 and ε_2 are uncorrelated, both equations can be estimated separately as single probit models, but when the error terms might be correlated, a bivariate probit model is required. Greene (1998, 2002) shows that the endogeneity of y_1 does not affect the likelihood of the bivariate probit.

[4] The Sarbanes-Oxley Act mandates the disclosure of whether at least one financial expert sits on the firm's audit committee. Around the same time, NYSE and Nasdaq adopted their new listing requirements on corporate governance to emphasize the need for more financial expertise on board. For example, the NYSE requires that at least one audit committee member have accounting or related financial management expertise and that all members be financially literate.

[5] To qualify as a financial expert, a person must have "experience preparing, auditing, analyzing, or evaluating financial statements ... or experience actively supervising one or more persons engaged in such activities."

and without IB directors (Greene, 1998).[6] The calculation based on the estimated coefficient reveals that firms with IB directors are 11% more likely to make acquisitions than other firms. In Model 4.4, we repeat the bivariate probit analysis for the subsample that further requires information of CEO and firm governance characteristics. Our results remain robust.

We also estimate a standard instrumental variable two-stage least squares (2SLS) regression, where both the dependent variable and the potentially endogeneous variable are assumed to be continuous. Models 4.5 and 4.6 report the linear IV regression results for the whole sample and the reduced sample, respectively. The coefficient on the *IB Director* variable is positive and significant at the 1% level, confirming the positive impact of IB directors on a firm's acquisition propensity. A direct inference of the magnitude of the coefficient is that firms with IB directors are 15-16% more likely to undertake acquisitions. However, we caution against such a direct inference, because 2SLS can produce predicted values that are out of bounds when a model has both a binary dependent variable and binary explanatory variables. Instead, we rely on probit and bivariate probit estimations to infer the marginal effect of IB directors on a firm's acquisition propensity, because these estimations are considered more appropriate and efficient in a setting like ours (Greene, 1998, Chiburis, Das, and Lokshin, 2012).

To further ensure that our results are not driven by reverse causality, we conduct several additional tests using subsamples that are less prone to endogeneity concerns and present the results in Panel B of Table 4. First, if an IB director is appointed to the board to facilitate anticipated acquisitions, the deal is likely to be announced shortly after the director's appointment. Therefore, we exclude observations in which IB directors have three or fewer years of tenure on the board and re-estimate the baseline regression of the acquisition propensity. The results of the three aforementioned methods are reported in Panel B Models 4.7, 4.9, and 4.11, respectively. The coefficient on the *IB Director* dummy based on the regular probit regression is 0.060, statistically different at the 10% significance level. This effect is

[6] Specifically, the marginal effect of the IB dummy is $E(y_2 = 1 | y_1 = 1) - E(y_2 = 1 | y_1 = 0)$. The estimation results for marginal effects are averaged across all observations. For variables that enter into both equations, the computation of marginal effects is complicated by the effect that these variables have on the acquisition likelihood as well as the indirect effect through the endogenous dummy.

comparable to what we derive from the whole sample. *Ceteris paribus*, firms with IB directors on the board are 14.9% more likely to make an acquisition than other firms. The results become even stronger when we use the IV approach with both the bivariate probit regression and the 2SLS regression. Second, if investment banking experience is a required attribute for the director appointment, directors who join the board before gaining investment banking experience should be free of such endogeneity concerns. We therefore limit the acquisition propensity tests to a subsample of IB directors who gain investment banking experience after joining the board. The results in Panel B Models 4.8, 4.10, and 4.12 show that our findings remain robust.

The final robustness test we perform in this section is a difference-in-difference analysis. In particular, we use the exogenous changes to board composition triggered by SOX and other related mandates in 2002 to identify firms that were forced to appoint financial experts (i.e., IB directors) to their board. Panel A of Table 5 reports the time distribution of the change in the presence of IB directors during our sample period. There is a significant increase in the presence of IB directors in 2003, i.e., immediately after SOX took effect.[7] Compared to changes in other sample years, the differences are both economically and statistically significant. From the end of 1999 to the end of 2002, the annual increase in firms with at least one IB director on their board hovered around 1.2% to 1.5%, before it spiked to more than 3% during 2003 and then settled at about 1% in each of the subsequent years. To identify board changes resulting from SOX, we compare each firm's board composition before and after the disclosure regulation became effective. Specifically, we identify firms with no IB directors prior to 2002 (i.e., during 1999-2002) that added at least one IB director immediately after SOX (i.e., during 2003). This procedure yields 192 unique firms. Next, we estimate a firm fixed effects regression of acquisition propensity against the presence of IB directors for the sample period from 1999 to 2008. To control for the firm fixed effects in the multivariate analysis requires the sample firms to make at least one acquisition during the sample period, which further reduces the sample size to 65 firms (out of the 192

[7] The SEC's final rule on financial expert disclosure was imposed on annual reports filed for fiscal years ending on or after July 15, 2003.

firms experiencing exogenous changes in the board composition).[8] The results are reported in Panel B of Table 5. The estimated coefficient on the acquisition dummy suggests that firms are less likely to make acquisitions if they have made deals in the past three years. More importantly, we find that acquisition probability is positively related to the *IB Director* indicator after we control for all other time-invariant firm characteristics. The marginal effect suggests that having at least one IB director increases the acquisition propensity by 9%. Overall, our evidence suggests that the positive impact of IB directors on the probability of acquisitions is not driven by endogenous director selection.

Another commonly used exogenous shock to address the endogeneity of board composition is the death of directors, because director exits due to death are unlikely to be correlated with firm policies (Bennedsen, Perez-Gonzalez, and Wolfenzon, 2011, Fracassi and Tate, 2012, Fracassi, 2012). However, we find only 17 IB director deaths during our sample period. None of these firms make any deals around the events, preventing us from adopting this alternative approach to address endogeneity concerns.

4. IB directors and the acquirer announcement returns

If IB directors provide valuable advice to firms in making acquisition decisions, we expect such firms to make better acquisitions and receive more favorable market reactions around the acquisition announcements. In this section, we examine whether acquiring firms experience higher abnormal announcement returns when they have at least one IB director on board.

4.1. Acquisition sample

Our sample of M&A deals consists of 2,465 acquisitions of U.S targets by 1,390 unique U.S public acquirers during 1999-2008. Among these, 808 deals (33%) have at least one IB director on the acquirer's board. During the ten-year period, the percentage increases from 26% in 1999 to 39% in 2008.

[8] In this difference-in-difference regression controlling for the firm fixed effects, we use the logistic regression rather than the probit regression because the former is econometrically superior in generating consistent estimate in such settings (Greene, 2004).

The aggregate deal value by acquirers with IB directors is $1.14 trillion, representing 51% of the aggregate transaction value over our sample period.

Table 6 contains descriptive statistics of the key control variables used in this section. Detailed definitions of the variables are given in the Appendix. Besides the *IB Director* dummy, we construct another variable, *IB Director(%)*, defined as the proportion of IB directors on the acquirer's board. For the subsample of deals by acquirers with IB directors, a typical acquiring firm has one IB director, representing 15% of the board size, and more than 20% have multiple IB directors. We also identify IB directors with potential conflicts of interests, defined as the IB director being affiliated with the investment bank involved in the takeover process when the deal is announced. In our sample, there are only 1.94% (48 out of 2,465) deals involving IB directors with concurrent affiliation with the deal advisors. We also observe that acquirers with IB directors have different firm characteristics. On average, they are larger and have lower market-to-book ratios, higher leverage and higher cash flows than firms without IB directors. The average transaction value is $908 million, or 27% of the acquirer's total assets. About 42% of the target firms are publicly traded. Acquirers with IB directors are also more likely to target public firms and use cash as payment.

4.2. Acquirer announcement returns

To calculate the acquirer abnormal returns around the acquisition announcement, we first estimate the market model for each acquirer over a 200 day period ending 11 days before the announcement dates with the CRSP value weighted return as the market return (Masulis, Wang, and Xie, 2007). We then use the estimated parameters to calculate the cumulative abnormal returns (CAR) over the three-day (-1, +1) event window centered on the announcement date (Hackbarth and Morellec, 2008, Bouwman, Fuller, and Nain, 2009, Deng, Kang, and Low, 2013). The three-day window should capture the bulk of the announcement effect even if the news leak out early or the market responds late. Expanding the window beyond three days could capture more of the announcement effect, but it also introduces more noise. Nevertheless, we find that the results are similar if we use a five-day event window.

The average acquirer CAR for the full sample of acquisitions is positive (0.3%) but not significantly different from zero. When we bifurcate the sample based on the presence of IB directors on the acquiring firms' board, we find that the mean CAR for acquirers without IB directors is not significantly different from zero. In contrast, the mean CAR for acquirers with IB directors is 0.7%, statistically significant from zero at the 5% level. This suggests that, unconditionally, the presence of IB directors is associated with an increase in acquirers' shareholders wealth upon the acquisition announcement.

Next, we estimate regressions of acquisition returns controlling for the determinants of acquirer announcement returns documented in previous studies (Asquith, Bruner, and Mullins, 1983, Travlos, 1987, Byrd and Hickman, 1992, Yermack, 1996, Chang, 1998, Moeller, Schlingemann, and Stulz, 2004, 2005). The control variables include firm and deal characteristics, such as acquirer board size, board independence, firm size, the market-to-book ratio, leverage, cash flow, whether the acquirer owns more than 5% of the target's stock prior to the announcement date, method of payment, and identifiers for deal competition, conglomerate deals, tender offers, and target public status. We also control for year and industry fixed effects in all of our regressions.

Table 7 presents the regression results. The dependent variable is the three-day CAR for acquirers. The primary explanatory variable of interest is the *IB Director* dummy or *IB Director(%)*. The results in Models 7.1 and 7.2 suggest that both *IB Director* and *IB Director(%)* are positively and significantly associated with the acquirers' announcement returns. The presence of investment bankers on the board increases the acquirers' three-day CAR by 80 basis points compared to the sample average of 30 basis points. Increasing *IB Director(%)* by one standard deviation raises the three-day CAR by 64 basis points. The marginal effect is similar to the impact of a one standard deviation decrease in log acquirer size. For other control variables, our estimated coefficients are similar to those reported in earlier studies. Deals involving cash financing or tender offers have higher announcement returns, whereas deals involving large acquirers, public targets or competing offers are associated with lower returns.

Li and Prabhala (2007) argue that most corporate decisions are non-random. In our context, acquirer returns are only available for firms that decide to make acquisitions, and a firm's acquisition decision might be influenced by management's expectations of the market reaction to the announcement. To control for such potential self-selection bias, we employ a two-stage Heckman selection model (Heckman, 1979). In the first stage, we use a probit regression of the acquisition likelihood, as shown in Model 4.1 of Table 4. In the second stage, we add the Inverse Mills ratio as an additional independent variable in our estimation of acquirer announcement returns. Models 7.3 and 7.4 in Table 7 present the regression results. The coefficients on our key explanatory variables, *IB Director* and *IB Director(%)* remain positive and significantly different from zero, and they have the same magnitudes.

In Models 7.5 and 7.6, we add CEO ownership, CEO age, CEO gender, and GIM-index to our baseline regression for a subsample of 792 deals for which we have information on these additional control variables. The estimated coefficients of *IB Director* and *IB Director(%)* are persistently positive, although the significance level decreases, presumably due to a significant reduction in sample size. We also verify that our findings are not driven by outliers, as our results remain robust when we winsorize the dependent variables at the 1^{st} and 99^{th} percentiles.

Güner, Malmendier, and Tate (2008) examine the effect of IB directors on acquisition performance based on 526 acquisitions made by large and mature firms during 1988–2001. Unlike us, they do not find a positive relation between the presence of IB directors and acquirer announcement returns. In Models 7.7 and 7.8, we repeat our baseline regressions using only firms within the largest size quartile. The coefficient on the *IB Director* dummy is not significantly different from zero. However, the coefficient on *IB Director(%)* is still positive and significant. Moreover, in a subsample of acquisitions by acquirers with IB directors (i.e., *IB Director* = 1), we find a significant positive relation between *IB Director(%)* and the acquirer returns. This suggests that *IB Director(%)* better captures the underlying effect, and in our remaining analyses, we only report results for *IB Director(%).* However, our results are qualitatively similar if we use the *IB Director* dummy instead.

4.2.1. IB directors with potential conflicts of interests

In our sample, there are 48 deals involving IB directors with concurrent affiliation with the deal advisors upon the acquisition announcement. We conjecture that the concurrent affiliation represents a conflict of interests. However, we find no evidence that IB directors in this subsample have a different impact on deal performance. For example, the coefficient of the IB director dummy is positive with a t-statistic of 0.58. Therefore, the conflict of interests appears to play little role in our sample, though we caution drawing strong inferences due to the limited sample size.

4.2.2. Identification concern

The positive relation between the presence of IB directors and acquirer abnormal announcement returns might be subject to selection bias. For instance, firms that foresee good acquisition opportunities may hire IB directors to facilitate the anticipated acquisition process. However, the mean tenure of the IB directors in our sample of 5.9 years mitigates the endogeneity concern, as it is unlikely for firms to appoint IB directors in anticipation of acquisitions several years later. Nevertheless, we perform robustness tests by eliminating deals that are more likely subject to the endogeneity concern. Specifically, we remove deals in which the acquiring firms' IB directors are appointed within three years leading up to the deal (i.e., IB directors with short tenure) or deals in which the IB directors gained investment banking experience before they joined the board. We find that the coefficient on *IB Director(%)* remain consistently positive, quantitatively similar, and statistically significant. Overall, our findings suggest that selection bias does not explain the positive relation between the presence of IB directors on the acquirer board and the acquirer acquisition announcement returns.

4.2.3. When are IB directors most valuable?

We next compare the size of the effects across different types of deals and acquirers to provide further evidence that our results are robust to the consideration of endogenous director selection and to shed light on the mechanisms through which IB directors add value. To the extent that directors'

investment banking experience is valuable to the acquirer, their influence is likely to be more pronounced in acquisitions in which the target's size constitutes a significant proportion of the combined entity. To test this conjecture, we construct an indicator variable for deals with a relative target size above the sample median and interact this indicator variable with our IB director measure, *IB Director(%).* We then repeat our baseline regression of acquirer CARs with this additional interaction term and report the results in Model 8.1 of Table 8. The estimated coefficient on *IB Director(%)* remains positive and significant. More importantly, the positive coefficient on the interaction term suggests that IB directors are particularly valuable when the deal is economically significant. For large deals, one standard deviation increase in *IB Director(%)* raises the three-day CAR by 1.17%, more than double the impact on the acquirers' abnormal announcement returns when the deal is small.

Second, we conjecture that directors with current experience and/or a current network have a greater influence on the deal process because of better access to various resources. Accordingly, we account for the director's employment status at the time of the announcement of the deal. IB directors with *Current experience* refer to those employed by an investment bank when the deal is announced. We find that among deals with IB directors, 27.6% (223 out of 808) involve currently active IB directors. We interact this indicator variable with our IB director measure and add the interaction to our baseline regression. The results, reported in Model 8.2, support our conjecture. The estimated coefficient on the interaction term (*IB director(%)* × *Current experience*) is positive and statistically significant at the 5% level, suggesting that having IB directors with current investment banking experience is particularly valuable for the acquiring firm. *Ceteris paribus*, for a median acquirer with eight directors, adding an IB director with past investment bank experience to the board leads to 0.57% higher average abnormal returns, whereas adding one with current experience leads to 1.76% higher average abnormal returns. This translates into $24.9 million and $79.2 million, respectively, in enhanced shareholder value for an average acquirer in our sample.

Following the same line of argument, IB directors should be more valuable when they have better access to information. We use an IB director's social network size as a proxy for information flow.

Specifically, we count the number of top managers and directors in the network (i.e., top managers and board members in all public companies) socially connected to each IB director and examine whether IB directors with more connections help firms make better acquisitions. Two individuals are defined as socially connected if they graduated from the same university within one year of each other, if they simultaneously worked at the same company either in managing roles or as directors, or if they belong to the same social organization.[9] If a director's network size is above the sample median, we define him/her as socially well connected. The results are represented in Model 8.3. Consistent with our conjecture, IB directors with a larger network benefit firms more in the context of acquisitions. However, when we add all the aforementioned interactions together in Model 8.4, the impact of the social network becomes insignificant, which suggests that IB directors' current working status captures most of the network effects.

Finally, we examine whether boards' IB expertise is especially valuable when it is needed most. We conjecture that the expertise of IB directors is especially helpful for firms with inexperienced CEOs. A CEO is considered inexperienced if his or her tenure in the bidder's industry is below the sample median. The results are presented in Model 8.5. In a reduced sample (771 out of 2,465 deals) with information on CEO characteristics, we find that acquirers with inexperienced CEOs benefit more from the presence of IB directors, suggesting that the impact of the IB directors increases with the importance of their advisory roles. Finally, for completeness, we include all the aforementioned interaction terms in one regression using the reduced sample and report the results in Model 8.6. We find that IB directors are especially valuable when the deal is economically significant to the acquirer and when the CEO is relatively inexperienced.

In summary, we find strong evidence that the acquiring firms with IB directors are associated with higher abnormal announcement returns. The positive impact is more pronounced when the deal is economically more significant to the acquirer, when the director is concurrently affiliated with an

[9] Social connections are measured at the last fiscal year-end prior to the acquisition. When we measure an IB director's connections, we exclude her connections to top managers or other directors within the acquiring firm.

investment bank, and when the acquirer CEO is less experienced. This favorable market reaction is consistent with investment bankers improving either the screening process or the implementation of the deal.

4.3. Long-run buy-and-hold abnormal returns

The announcement returns suggest that IB directors have a favorable effect on the acquisitions process. It is conceivable that investors do not fully understand this effect until later. It is alternatively possible that the effect is temporary. Thus, we examine whether acquirers with IB directors outperform other firms in terms of long-run abnormal stock performance. Specifically, we analyze the acquirer Fama-French adjusted buy-and-hold abnormal returns (BHARs) over three years after the acquisition announcement dates. To calculate the Fama-French adjusted BHARs, we first regress monthly returns on the Fama-French three factors using five years of data leading up to the acquisition event, and then use the estimated coefficients to calculate monthly abnormal returns before compounding.

Figure 1 depicts the median Fama-French adjusted BHARs from quarter 1 to quarter 12 after the acquisition announcements for two subsamples, as well as the difference between them. We find that acquirers with IB directors outperform other acquirers in a statistically significant and economically meaningful way. Over a one-year horizon starting at the deal announcement, acquirers with IB directors outperform those without by 3%, and the number grows to 5.6% for a two-year horizon and 7.1% for a three-year horizon.

We reported earlier that deals in the two subsamples are different in both deal size and methods of payment. Accordingly, we partition our sample based on deal characteristics and report the median BHARs in Table 9. The results show that within each subsample, acquirers with IB directors outperform other acquirers, and the differences remain statistically significant in most cases. For example, among large deals, acquirers with IB directors outperform the other group by 10.1% over a three-year horizon. When focusing on stock deals, we find an even greater difference of 22% for the three-year BHARs. In

sum, our evidence on long-term returns suggests that the announcement returns, if anything, understates the favorable effect that IB directors have on the acquisition process.

5. Sources of the value gain

Our analysis so far suggests that IB directors add value to acquirers. In this section, we explore potential sources of the value gains associated with acquisitions to identify the mechanisms through which IB directors add value to acquirers. In particular, we conjecture that IB directors help in reducing both the takeover premium paid to the target and fees paid to the outside advisors. We further conjecture that IB directors help in screening targets, thereby enhancing the long-run operating performance of the acquirer. We test these conjectures separately in the next subsections.

5.1. Takeover premium

If acquiring firms benefit from the financial expertise of IB directors in valuing the target, they might be less likely to overpay. Therefore, we conjecture that acquirers with IB directors, on average, pay lower acquisition premiums. Models 10.1-10.3 in Table 10 present our analysis of the effect of IB directors on takeover premiums. The dependent variable is the acquisition premium, defined as the difference between the price paid per share and the target share price four weeks prior to the deal announcement date. All regressions control for the acquiring firm characteristics and deal characteristics as well as target firm characteristics such as the market-to-book ratio, leverage, and cash flow.

The results in Model 10.1 suggest that, on average, the presence of an IB director does not influence the takeover premium. *IB Director(%)* is negatively related to the takeover premium, but the coefficient is not significantly different from zero. Recall that our findings on the acquirer abnormal announcement returns based on the comprehensive sample suggest that the IB directors' expertise is especially valuable when the deals are economically more significant to the acquirer and when the directors' IB experience is current. Therefore, in Model 10.2, we add an interaction term between *IB Director(%)* and the *Large deal* dummy. It shows that for the sample of large deals, the presence of IB

directors is significantly negatively related to the takeover premium. This lends further support to the view that IB directors assist in reducing the takeover price in important deals. Specifically, for large deals, a one standard deviation increase in *IB Director(%)* is associated with a 6.3% decrease in takeover premium. In Model 10.3, we add an additional interaction to test whether directors with current investment banking experience have any different impact on target returns. The results show that IB directors' current and past investment banking experience has similar effects.

5.2. Acquirer advisory fees

To facilitate M&A transactions, firms generally hire investment banks to provide professional advice. If acquirers have investment bankers on the board, their need for outside financial advisors is likely to be lower and they might be in a better position to negotiate fees. Thus, we expect that advisory fees are lower for acquirers with IB directors.

We collect information of M&A advisors from SDC and investigate the dollar amount of financial advisory fees paid by the acquirers. Because a substantial number of deals either take place without the use of advisors or do not provide detailed fee information, to obtain a reasonably large sample, we do not require that the target be public in this test. Models 10.4-10.6 in Table 10 report the empirical results. The dependent variable is the natural logarithm of the financial advisory fees paid by the acquirers.[10] In all regressions, we control for acquirer characteristics, deal characteristics, and industry and year fixed effects.

The results in Model 10.4 show that the presence of an IB director is associated with significantly lower advisory fees paid by the acquirers, consistent with our conjecture. For example, a one standard deviation increase in *IB Director(%)* is associated with a 12% decrease in the advisory fees paid to outside consultants. Given the average advisory fees of $8.39 million in our sample, this translates to a $1 million reduction in fees paid by acquirers.

[10] For a robustness check, we also use percentage advisory fees, defined as the amount of fees scaled by deal value, as a dependent variable and obtain similar results.

Following our previous analysis, we also examine whether the negative relation between the presence of the IB directors and the advisory fees is more pronounced when the relative target size is large. In Model 10.5, we add an interaction term and find that IB directors reduce advisory fees more when a deal is economically more important to the acquirer. Finally, we explore whether the effect on advisory fees varies with the job status of the IB director. Our conjecture is that IB directors who are currently employed in the investment banking industry have more recent experience and better resources. As a result, an acquirer's need for outside consulting is further reduced. Moreover, having a concurrently active industry insider on the board can enhance an acquirer's position to negotiate the fee with the external deal advisor. The results in Model 10.6 are consistent with our conjecture. The impact of IB directors on advisory fees is greater when IB directors have a concurrent affiliation with an investment bank. Taken together, for an average acquirer that decides to make large deals, adding a currently active IB director is associated with a 57% ($4.78 million) decrease in the advisory fees paid to outside consultants.

5.3. Post-acquisition operating performance

In addition to helping reduce the takeover premium and advisory fees, IB directors might also help acquirers pick targets with greater synergy potential. We test this conjecture by investigating the post acquisition performance of the combined firms.

We use two operating performance measures. The first one is raw operating performance, calculated as earnings before the deduction of interest, tax and amortization expenses (EBITDA) scaled by sales. The second measure is industry-adjusted operating performance. Barber and Lyon (1996) show that tests of changes in operating performance are only well specified when the sample firms are matched to control firms of similar pre-event performance. We construct the industry-performance benchmark for each sample firm following Barber and Lyon (1996) and Vijh and Yang (2009). For each acquirer (target), we identify all firms with the same two-digit SIC code in the same year, but we exclude the acquirer and target firms. Among these firms, we select those with operating performance between 90%

and 110% of the acquirer/target firm's operating performance during the year before an acquisition announcement. If no firm meets the industry-performance criteria, we apply the 90% to 110% filter without imposing the same industry requirement. If still no matching firm is found, we select the single firm with operating performance closest to that of the sample firm. The benchmark-adjusted operating performance is then estimated as the difference between the performance of the sample firm and the median performance of the control group described above.

For pre-acquisition years, we calculate operating performance as the weighted-average performance of the acquirer and target firms, where the weights correspond to the relative sales of the two firms. The calculation of benchmark operating performance uses the same weighting procedure. For the post-acquisition years, the calculation of benchmark operating performance follows the same weighing procedure, where the weights correspond to the total sales of the acquirer and the target firms during the year before acquisition announcement. The calculation of the post acquisition operating performance for the combined firms does not require a weighing procedure.

We then compare changes in operating performance for acquiring firms from pre-acquisition to post-acquisition years across subgroups. We focus on changes rather than levels because Barber and Lyon (1996) show that change models dominate level models in detecting abnormal operating performance. Table 11 reports median changes in operating performance. Both measures show that acquirers with IB directors experience greater improvement in operating performance than their counterparts. The difference between the two subgroups is consistently significant. For example, five years after the acquisitions, acquirers with IB directors significantly outperform those without by 1.86 percentage points based on the benchmark-adjusted measure. Overall, the long-run performance evidence supports the idea that IB directors enhance the firm's ability to identify suitable targets and, hence, generate greater synergy in the long run

6. Conclusion

We analyze how IB directors affect firms' acquisition behavior and acquisition performance. Our results indicate that firms with directors who, at some point in their careers, held senior positions at investment banks (i.e., IB directors) are more likely to make acquisitions and, when they do, make better acquisitions. On average, having IB directors on the board increases the acquirer's three-day CAR by 80 basis points. The positive wealth effect of IB directors is more prominent when the target represents a significant proportion of the combined entity, suggesting that the importance of the financial expertise of IB directors increases with the economic significance of the acquisition. In addition, we observe a stronger effect when the IB directors concurrently work in an investment bank or when the acquiring firm's CEO is less experienced in the bidder's industry. Our results are robust to tests addressing endogeneity concerns.

We also explore potential sources of the value gains to acquirers with IB directors. We find that when the target is relatively large, the presence of IB directors on the acquiring firms' boards is associated with lower acquisition premiums and advisory fees and greater improvement in acquirers' operation performance after the acquisitions. Our findings suggest that directors with investment banking experience help the acquiring firms in (i) selecting better target candidates, (ii) valuing the targets, and (iii) reducing the firms' reliance on the outside M&A advisory service and/or negotiating lower advisory fees.

Our work contributes to the vast literature on the effect of the board of directors on corporate decision-making and how boards should be structured to enhance corporate value. More specifically, we shed light on the importance of relevant experience and financial literacy when serving on corporate boards. We also contribute to a growing literature on the effect of personal networks in the business world. Such networks can give rise to conflicts of interests, as emphasized in Güner, Malmendier, and Tate (2008), and/or be a valuable resource, as our results suggest.

There are several fruitful avenues for future research. One obvious avenue would be to consider the value of IB directors in other transactions that ordinarily require assistance from investment banks, such as securities offerings. Another would be to examine the effectiveness of IB directors in more ordinary

monitoring and advisory roles of the boards. Indeed, our observation that most firms have no IB directors suggests that non-IB directors are generally favored. A third, and more general, avenue would be to examine further the two-sided effect of directors' networks, as such networks can both be a resource and a burden.

Appendix Variable definitions

Variables	Definitions
Investment banker directorship characteristics	
IB director	Dummy variable equals one if there is at least one outside director with investment banking experience on board when the acquisition is announced. Source: BoardEx.
IB director (%)	Percentage of outside directors with investment banking experience on board when the acquisition is announced. Source: BoardEx.
Current experience	Dummy variable equals one if there is at least one IB director on board holding concurrent senior position at an investment bank when the deal is announced. Source: BoardEx.
Large network	Dummy variable equals one if there is at least one IB director on board whose network size is above the sample median value. The network size is measured as the total number of connected top managers and directors in all public companies. Source: BoardEx.
Conflict of interests	Dummy variable equals one if there is at least one IB director on board holding concurrent senior position at the deal's advisory bank when the deal is announced. Source: BoardEx.
Dependent variables	
CAR [-1,1]	Three-day cumulative abnormal return centered on the acquisition announcement date is calculated using the market model estimated over the 200-day period ending 11 days before the acquisition announcement dates, with the CRSP value-weighted return as the market index. Source: CRSP.
Acquirer BHARs	Acquirer BHARs is calculated over the event window starting on the day after the acquisition announcement date and ending on up to 3 years (i.e. 12 quarters) after the acquisition announcement. We first regress the 5-year monthly returns leading up to merger events on the monthly Fama-French three factors and then use the estimated coefficients to calculate the acquirer's monthly abnormal returns before compounding for the appropriate event window. Source: CRSP.
Takeover premium	Premium is calculated based on the offer price relative to the target trading price four weeks prior to the original announcement date (i.e. PREM4WK). Source: SDC.
Advisory dollar fees	Total dollar amount advisory fees paid by the acquirer. Source: SDC.
Firm characteristics	
Assets	Total assets. Source: Compustat.
Market-to-book	(Total assets - Book equity + Market value of equity) / Total Assets. Source: Compustat.
Leverage	(Long-term debt + Debt in current liabilities)/ Total assets. Source: Compustat.
Cash flow	Operating income before depreciation (EBITDA) /Total assets. Source: Compustat.
Cash holdings	Cash and cash equivalent holdings /Total assets. Source: Compustat.
Avg. abnormal return	Average daily market-model abnormal return over year t-1. The market model parameters are estimated using the daily returns from year t-2. Source: CRSP.
Sales growth	$(Sales_t - Sales_{t-1})/Sales_{t-1}$ calculated at the beginning of each fiscal year. Source: Compustat.
Noncash working capital	(Net working capital □ Cash and cash equivalents)/ Total assets. Source: Compustat.
Price-to-earnings	Stock price /Earnings per share at the beginning of each fiscal year. Source:

	Compustat
Firm age	Number of years since the firm was first listed on. Source: CRSP.
Location	Dummy variable equals one if the firm is located in NY, NJ, CA, IL, or MA, and zero otherwise Source: Compustat.
Post-SOX	Dummy variable equals one for years post 2002. Source: Compustat.
SEO Dummy	Dummy variable equals one if a firm issues any seasoned equity offerings within the past three years. Source: SDC.
Debt issuance dummy	Dummy variable equals one if a firm issues any debt within the past three years. Source: SDC.
Prior acquisition dummy	Dummy variable equals one if a firm makes any acquisitions within the past three years. Source: SDC.
Governance measures	
Board size	Number of directors on the board. Source: BoardEx.
Board independence	Dummy variable equals one if over 60% of directors are independent. Source: BoardEx.
GIM index	Governance index based on 24 antitakeover provisions, taken from GIM (2003).
CEO ownership	Acquirer CEO's percentage ownership of the firm, including both stock and stock options. Source: RiskMetrics.
CEO age	The age of acquirer CEO. Source: RiskMetrics.
CEO gender	Dummy variable equals one if the acquirer CEO is a male. Source: RiskMetrics
Inexperienced CEO	Dummy variable equals one if the acquirer CEO's tenure in the bidder's industry is below the sample median value. Source: RiskMetrics.
Deal characteristics	
Transaction value	Deal value as reported by SDC, adjusted to 2009 dollar. Source: SDC.
Relative transaction value	Transaction value /Acquirer market value of equity. Source: SDC.
Public target	Dummy variable equals one for public target, and zero otherwise. Source: SDC.
Private target	Dummy variable equals one for private target, and zero otherwise. Source: SDC.
Subsidiary target	Dummy variable equals one for subsidiary target, and zero otherwise. Source: SDC.
Related deal	Dummy variable equals one if the target and the acquirer have different two-digit SIC codes, and zero otherwise. Source: SDC.
Toehold	Dummy variable equals one if acquirer holds 5% or more of the target stock prior to the announcement, and zero otherwise. Source: SDC.
Cash deal	Dummy variable equals one for deals that are paid for 100% in cash, and zero otherwise. Source: SDC.
Stock deal	Dummy variable equals one for deals that are paid for 100% in stock, and zero otherwise. Source: SDC.
Tender-offer	Dummy variable equals one for tender offers as identified by SDC, and zero otherwise. Source: SDC.
Competition	Dummy variable equals one if a deal has competing bidders as identified by SDC, and zero otherwise. Source: SDC.
Large deal	Dummy variable equals one if the relative transaction value is above the sample median value, and zero otherwise. Source: SDC.

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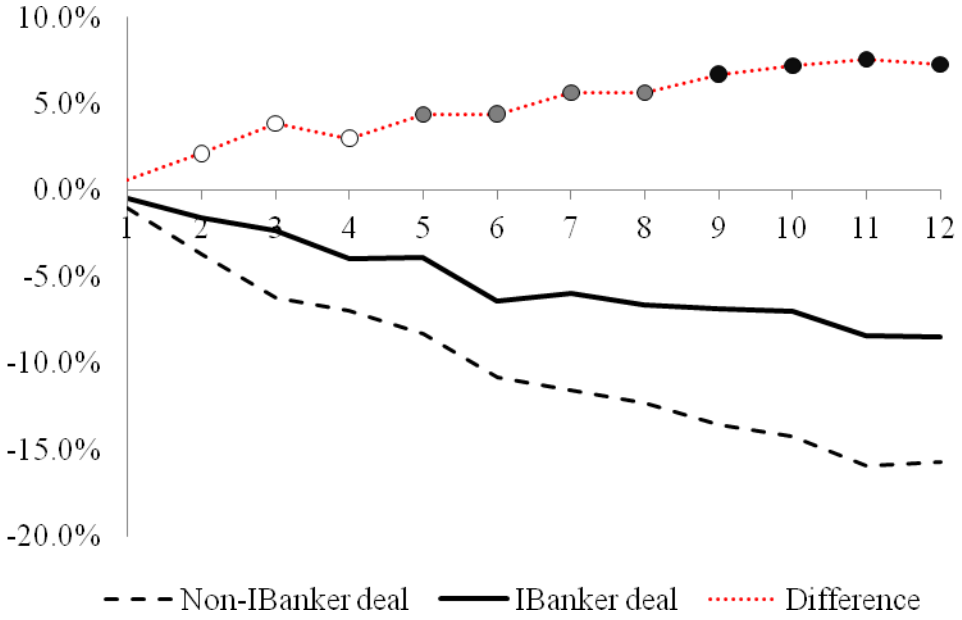

Fig. 1. Acquirer Fama-French risk-adjusted buy-and-hold abnormal returns (BHARs).This figure depicts the acquirer Fama-French risk-adjusted BHARs over the 12 quarters window after the acquisition announcement. The acquisition sample consists of 2,465 completed U.S. mergers and acquisitions between 1999 and 2008 as described in Table 2. The figure plots the median BHARs for subsamples grouped by the presence of investment banker directors (IB directors) at the time of acquisition announcement as well as the differences between the two subsamples. Five-year monthly returns leading up to the acquisition events are used to estimate the Fama-French three factor model. Returns are calculated using the estimated coefficients and then compounded monthly over the relevant periods. Black, gray, and white markers denote statistical significance of the differences at the 1%, 5%, and 10% levels, respectively.

Table 1

Top 10 investment banks

This table presents two ranking lists of investment banks. The first list is the ten most active Mergers and Acquisitions advisors in terms of the aggregate deal value that they advise in the U.S. market during 1980-2008, based on data from SDC's Mergers and Acquisition database. The second list is the ten investment banks that have the largest number of connected directors at public firms with whom they once shared an employment relation.

Ranking	Ranked by aggregate deal values	Ranked by number of affiliated directors
1	GOLDMAN SACHS	MORGAN STANLEY
2	MORGAN STANLEY	LEHMAN BROTHERS
3	MERRILL LYNCH	GOLDMAN SACHS
4	J.P. MORGAN	BEAR STEARNS & CO INC
5	CITIGROUP	SALOMON BROTHERS
6	CREDIT SUISSE	J.P. MORGAN
7	BARCLAYS CAPITAL	MERRILL LYNCH
8	UBS	CITIGROUP
9	LAZARD	CREDIT SUISSE
10	DEUTSCHE BANK AG	LAZARD

Table 2

Summary statistics for the aggregate sample

This table reports the summary of our firm-year observations. Our sample consists of 41,393 firm-years included in CRSP, Compustat, and BoardEx databases during 1998 to 2008. Panel A reports the number of firms and the percentage of firms with investment banker directors (IB directors) in each of the sample year. We identify a director serving on the board of a public firm in our sample as an IB director if she, at some point in her career, held a senior position at any of the one hundred most active investment banks. Panel B presents the sample distribution by the Fama-French 12-industry category. We exclude financial and utility firms from the sample. Therefore, our sample corresponds to ten Fama-French industries. Panel C presents the mean and median values of the firm characteristics for two subsamples of firms partitioned by the presence of IB directors respectively. The definitions of all the firm characteristic variables are described in the Appendix. All the continuous variables are winsorized at the 1^{st} and 99^{th} percentiles and all dollar values are adjusted to 2009 dollars. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels based on t-tests for the differences in mean values and Wilcoxon tests for the differences in median values.

Table 2 continued …

Panel A: Distribution of observations by year

Year	Number of firms	Firms with IB director (%)
1998	3,827	17.3
1999	3,989	18.4
2000	4,084	19.5
2001	3,906	20.9
2002	3,787	22.6
2003	3,728	25.3
2004	3,794	26.4
2005	3,782	27.3
2006	3,713	28.4
2007	3,570	28.9
2008	3,213	29.7
Total	41,393	23.9

Panel B: Distribution of observations by industry

Fama-French Industry	Number of firm years	Firms with IB director (%)
Consumer nondurables	2,654	33.0
Consumer durables	1,120	18.4
Manufacturing	5,172	22.6
Oil, gas, and coal	1,887	25.1
Chemical products	1,116	25.7
Business equipment	10,637	19.6
Telephone and television	1,624	31.5
Wholesale and retail	5,115	27.2
Healthcare	5,820	21.7
Other	6,248	25.8
Total	41,393	23.9

Panel C: Summary statistics

	Firms with IB director (N=9,893)		Firms without IB director (N=31,500)	
	Mean	Median	Mean	Median
Log (Assets)	6.67	6.60	5.58***	5.48***
Market-to-book	2.17	1.60	2.27***	1.56***
Leverage	0.24	0.21	0.21***	0.15***
Prior acquisition dummy	0.21	-	0.16***	-
Cash holdings	0.19	0.09	0.22***	0.12***
Avg. abnormal return (basis points)	-0.32	-0.76	-0.25*	-0.62*
Sales growth	0.18	0.06	0.23***	0.07
Noncash working capital	0.03	0.02	0.05***	0.05***
Price-to-earnings	13.74	13.72	11.64***	10.53***

Table 3

Univariate results of acquisitions propensity

This table reports the univariate results for the relation between the presence of IB directors and a firm's acquisition propensity. Specifically, this table reports the number of firms and the percentage of firms that make at least one acquisition in each sample year for two subsamples based on the presence of IB directors. The identification of IB directors and the aggregate sample of firm years are described in Table 2. The sample of acquisitions is retrieved from the SDC Mergers and Acquisitions database and consists of 2,465 completed U.S. mergers and acquisitions announced by sample firms between 1999 and 2008.

	Firms with IB director		Firms without IB director	
Year	Number of firms	% of firms making acquisitions	Number of firms	% of firms making acquisitions
1999	661	6.66	3,166	5.09**
2000	733	9.41	3,256	7.00**
2001	795	5.91	3,289	4.93
2002	818	5.38	3,088	4.11*
2003	857	6.18	2,930	3.28***
2004	944	6.36	2,784	4.99*
2005	1,001	7.49	2,793	5.05***
2006	1,032	7.56	2,750	5.16**
2007	1,054	7.50	2,659	5.45**
2008	1,030	5.73	2,540	4.25**
Total	8,925	6.81	29,255	4.95***

Table 4

Regression analysis of acquisition propensity

This table reports results of regression analysis of the probability that a firm makes at least one acquisition in a given year. The sample is described in Table 2 and Table 3. The dependent variable equals one if a firm completes an acquisition and zero otherwise. Model (4.1) reports the regular probit regression results, while Model (4.2) repeat the regular probit regression with additional controls for CEO characteristics and board characteristics. The limited availability of these additional control variables further reduces the sample size. In addition, to address the potential endogeniety concerns, we use two alternative econometrics estimation methods in our regression analysis. Model (4.3) and (4.4) report the recursive bivariate probit regression results, and Model (4.5) and (4.6) report the two stage least square regression results. Finally, in Panel B, we limit the analyses to two reduced samples that are less likely to be subject to the endogeniety concerns: a subsample that excludes firm-year observations where the IB director's tenure on board is less than three years and a subsample that excludes firm-year observations where the IB director joined the firm with prior IB experience. For each of the estimation methods used in Panel A, we repeat the baseline regressions using the two reduced samples separately. Regression results of the regular probit models, recursive bivariate probit models, and 2SLS models are reported in Models (4.7) and (4.8), Models (4.9) and (4.10), and Models (4.11) and (4.12), respectively. Definitions of the independent variables are described in the Appendix. All regressions in Panel B control for the set of firm characteristic variables included in our baseline regressions reported in Panel A. The regression coefficients of these control variables are suppressed for brevity. All regressions control for the calendar year-fixed effects and the industry (Fama-French 48 industry) fixed effects. P-values are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Regression analysis of acquisition propensity with full sample

	Predicting acquisition propensity (Acquisition = 1)					
	Probit		Bivariate Probit		2SLS	
Variable	(4.1)	(4.2)	(4.3)	(4.4)	(4.5)	(4.6)
IB director	0.057**	0.111**	0.799***	0.759***	0.159***	0.155***
	(0.027)	(0.044)	(0.000)	(0.001)	(0.000)	(0.007)
Log (Assets)	0.128***	0.142***	0.099***	0.099***	0.006***	0.016***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Market-to-book	0.052***	0.047***	0.048***	0.049***	0.007***	0.013***
	(0.000)	(0.006)	(0.000)	(0.003)	(0.000)	(0.000)
Leverage	-0.261***	-0.309*	-0.264***	-0.262	-0.031***	-0.029
	(0.000)	(0.097)	(0.000)	(0.149)	(0.000)	(0.262)
Prior acquisition experience	0.399***	0.350***	0.352***	0.339***	0.048***	0.062***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cash holdings	0.167**	0.298	0.208***	0.295	0.006	0.052*
	(0.023)	(0.138)	(0.004)	(0.128)	(0.392)	(0.094)
Avg. abnormal return	0.208***	0.439***	0.175***	0.410***	0.011***	0.061***
	(0.008)	(0.001)	(0.000)	(0.002)	(0.008)	(0.002)
Sales growth	0.073***	0.178**	0.065***	0.175**	0.007***	0.027*
	(0.001)	(0.039)	(0.001)	(0.035)	(0.001)	(0.061)
Noncash working capital	0.417***	0.526**	0.433***	0.530**	0.034***	0.087**
	(0.000)	(0.039)	(0.000)	(0.031)	(0.000)	(0.013)
Price-to-earnings	0.001***	-0.0001	0.001***	-0.0001	0.0001***	-0.0001
	(0.002)	(0.561)	(0.001)	(0.595)	(0.000)	(0.491)
CEO ownership		-0.855		-0.857		-0.112*
		(0.127)		(0.113)		(0.099)
CEO age		-0.599***		-0.570***		-0.078**
		(0.007)		(0.000)		(0.016)
CEO gender		0.094		0.098		0.017

		(0.589)		(0.561)		(0.458)
Board size		0.005		-0.005		-0.002
		(0.679)		(0.719)		(0.289)
Board Independence		-0.082		-0.083		-0.015*
		(0.149)		(0.131)		(0.071)
Intercept	-2.843***	-0.314	-2.803***	0.087	-0.062**	0.033
	(0.000)	(0.736)	(0.000)	(0.932)	(0.023)	(0.838)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	38,180	5,751	37,750	5,740	37,750	5,740

Panel B: Regression analysis of acquisition propensity with subsamples

	Predicting acquisition propensity (Acquisition = 1)					
	Probit		Bivariate Probit		2SLS	
Variable	Exclude IB <= 3 years tenure (4.7)	Exclude IB with prior experience (4.8)	Exclude IB <= 3 years tenure (4.9)	Exclude IB with prior experience (4.10)	Exclude IB <= 3 years tenure (4.11)	Exclude IB with prior experience (4.12)
IB director	0.060*	0.109**	0.829***	1.043***	0.189***	0.250***
	(0.097)	(0.038)	(0.000)	(0.000)	(0.000)	(0.000)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	32,160	28,372	31,730	27,942	31,730	27,942

Table 5

The changes in the presence of IB directors and acquisition propensity

This table reports the changes in the presence of IB directors and firms' acquisition propensity around SOX. Panel A shows the annual change in the presence of IB directors for each sample year and the differences between each of these annual changes and the change in year 2003 (i.e., the first year after SOX takes effect). Panel B reports the results of a logistic regression of the probability that a firm makes at least one acquisition in a given year, using a reduced sample of firms that have no IB directors prior to 2002 (i.e.,during 1999-2002), but add at least one IB director immediately after SOX (i.e., in 2003). The dependent variable equals one if a firm completes at least one acquisition in a given year and zero otherwise. Definitions of the independent variables are described in the Appendix. The regression controls for calendar year-fixed effects and firm fixed effects whose coefficients are suppressed for brevity. P-values are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Changes in IB presence

Year	Change in presence of IB director (%)	Difference (%)
1999	1.18	1.93***
2000	1.45	1.66***
2001	1.55	1.56***
2002	1.23	1.88***
2003	3.11	-
2004	1.05	2.06***
2005	1.19	1.92***
2006	1.02	2.09***
2007	0.75	2.36***
2008	0.26	2.85***

Panel B: Regression of acquisition propensity

Variable	
IB director	0.116**
	(0.046)
Log (Assets)	0.123
	(0.690)
Market-to-book	0.014
	(0.913)
Leverage	0.065
	(0.954)
Acquisition dummy	-0.862***
	(0.002)
Cash holdings	0.368
	(0.803)
Avg. abnormal return	0.932*
	(0.069)
Sales growth	0.142
	(0.557)
Noncash working capital	2.092
	(0.235)
Price-to-earnings	0.0002
	(0.913)
Firm fixed effect	Yes
Year dummy	Yes
Number of observations	592
Pseudo R^2	0.116

Table 6

Summary statistics for the sample of acquisitions

The sample of acquisitions consists of 2,465 completed U.S. mergers and acquisitions between 1999 and 2008 as described in Table 3. This table reports the mean and median values of acquirer firm characteristics and deal characteristics separately for subsamples of acquisition partitioned by the presence of IB director in the acquirer firms at the time of the acquisition announcement. IB director deals refer to acquisitions by acquirers that have at least one IB director on the board when the deal is announced. Non-IB director deals refer to acquisitions by acquirers that have no IB director on the board when the deal is announced. All variable are defined in the Appendix. All the continuous variables are winsorized at the 1st and 99th percentiles and all dollar values are adjusted to 2009 dollars. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels based on t-tests for the differences in mean values and Wilcoxon tests for the differences in median values.

	IB director deals (N = 808)		Non-IB director deals (N = 1,657)	
	Mean	Median	Mean	Median
IB director (%)	0.15	0.13	-	-
IB director with conflict of interests (%)	5.94	-	-	-
Acquirer Log (Assets)	6.51	6.36	7.42***	7.34***
Acquirer board size	9.51	9.00	7.74***	7.00***
Acquirer board independence	0.77	-	0.74***	-
Acquirer prior acquisition experience	0.44	-	0.37***	-
Transaction value ($ millions)	1,413.65	121.99	661.34***	83.96***
Relative transaction value	0.25	0.08	0.27	0.09**
Cash deals	0.48	-	0.38***	-
Public target	0.49	-	0.39***	-

Table 7

Regressions of acquirer's three-day cumulative abnormal returns

This table reports results of OLS regressions of the acquirer's three-day cumulative abnormal returns. The sample of acquisitions consists of 2,465 completed U.S. mergers and acquisitions between 1999 and 2008 as described in Table 3. The dependent variable is the acquirer's three-day cumulative abnormal returns centered on the acquisition announcement. Definitions of the independent variables are described in the Appendix. Models (7.1) to (7.6) report regression results for the full sample of acquisitions. Model (7.7) and (7.8) report regression results for the reduced sample including only the acquisitions by acquirers within the largest size quartile. All regressions control for calendar year-fixed effects and industry (Fama-French 48 industry) fixed effects whose coefficients are suppressed for brevity. P-values based on standard errors adjusted for firm clustering are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	[-1, +1] Acquirer CARs							
	Full sample						Acquisitions by large acquirers	
	OLS		Heckman correction		OLS with additional controls		OLS	
	(7.1)	(7.2)	(7.3)	(7.4)	(7.5)	(7.6)	(7.7)	(7.8)
IB director	0.008**		0.008**		0.009*		0.006	
	(0.031)		(0.034)		(0.072)		(0.154)	
IB director (%)		0.072***		0.072***		0.075**		0.056**
		(0.002)		(0.004)		(0.017)		(0.036)
Acquirer characteristics:								
Acquirer log (Assets)	-0.004***	-0.004***	-0.004**	-0.004**	-0.0003	-0.001	-0.001	-0.001
	(0.008)	(0.006)	(0.017)	(0.015)	(0.858)	(0.779)	(0.825)	(0.768)
Acquirer market-to-book	0.001	0.001	0.000	0.000	-0.001	-0.001	-0.001	-0.001
	(0.439)	(0.450)	(0.674)	(0.707)	(0.555)	(0.572)	(0.412)	(0.422)
Acquirer leverage	0.017	0.016	0.015	0.015	0.015	0.015	0.013	0.015
	(0.173)	(0.195)	(0.249)	(0.282)	(0.367)	(0.345)	(0.493)	(0.455)
Acquirer cash flow	-0.022	-0.022	-0.022	-0.022	0.027	0.026	0.057	0.056
	(0.363)	(0.354)	(0.388)	(0.381)	(0.404)	(0.420)	(0.104)	(0.106)
Acquirer board size	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.189)	(0.212)	(0.307)	(0.153)	(0.403)	(0.215)	(0.844)	(0.625)
Acquirer board independence	0.002	0.001	0.002	0.002	-0.012**	-0.013**	0.008	0.007
	(0.802)	(0.898)	(0.832)	(0.748)	(0.018)	(0.012)	(0.461)	(0.517)
Acquirer prior acquisition experience	-0.005	-0.005	-0.009	-0.009	-0.009*	-0.009*	-0.008	-0.008
	(0.242)	(0.251)	(0.142)	(0.154)	(0.085)	(0.083)	(0.107)	(0.109)
Deal characteristics:								
Relative transaction value	0.014*	0.013*	0.013*	0.013*	-0.019**	-0.019**	-0.017	-0.017

	(0.065)	(0.078)	(0.084)	(0.083)	(0.032)	(0.029)	(0.038)	(0.038)
Toehold	0.004	0.004	0.004	0.004	-0.003	-0.004	-0.001	-0.001
	(0.541)	(0.542)	(0.544)	(0.547)	(0.729)	(0.680)	(0.897)	(0.920)
Competing offer	-0.024	-0.025*	-0.025	-0.025	-0.006	-0.007	-0.016	-0.016
	(0.108)	(0.097)	(0.110)	(0.103)	(0.562)	(0.515)	(0.196)	(0.201)
Stock deal	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	0.008	0.008
	(0.276)	(0.263)	(0.235)	(0.224)	(0.339)	(0.348)	(0.338)	(0.354)
Cash deal	0.011**	0.010**	0.011**	0.011**	0.009	0.009	0.022***	0.021***
	(0.017)	(0.038)	(0.017)	(0.018)	(0.120)	(0.123)	(0.001)	(0.001)
Related deal	-0.001	-0.001	-0.001	-0.001	0.001	0.001	-0.0004	-0.001
	(0.872)	(0.863)	(0.864)	(0.857)	(0.846)	(0.861)	(0.951)	(0.862)
Tender-offer	0.020***	0.019***	0.019***	0.019***	0.005	0.006	0.008	0.008
	(0.001)	(0.001)	(0.002)	(0.002)	(0.371)	(0.347)	(0.188)	(0.205)
Private target	0.003	0.003	0.004	0.004	-0.001	-0.0003	0.014*	0.015*
	(0.653)	(0.673)	(0.519)	(0.547)	(0.914)	(0.965)	(0.079)	(0.068)
Public target	-0.036***	-0.036***	-0.034***	-0.035***	-0.016*	-0.015*	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.056)	(0.065)	(0.872)	(0.940)
Intercept	0.005	0.003	0.008	0.007	-0.004	-0.006	-0.033	-0.036
	(0.780)	(0.848)	(0.349)	(0.456)	(0.917)	(0.875)	(0.284)	(0.229)
Inverse Mills Ratio	No	No	Yes	Yes	No	No	No	No
CEO characteristics	No	No	No	No	Yes	Yes	No	No
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,465	2,465	2,396	2,396	792	792	616	616
Adjusted-R^2	0.067	0.071	0.066	0.069	0.159	0.162	0.142	0.145

Table 8

Supplementary tests for acquirer's three-day cumulative abnormal returns

This table provides results of OLS regressions of the acquirer's three-day cumulative abnormal returns supplementary to those reported in Table 7. The sample of acquisitions consists of 2,465 completed U.S. mergers and acquisitions between 1999 and 2008 as described in Table 3. The dependent variable is the acquirer's three-day cumulative abnormal returns centered on the acquisition announcement. Our key independent variables of interest are the IB director (%) and its interactions with dummy variables indicating large acquisitions with transaction values above the sample median, IB directors holding concurrent positions at an investment bank, IB directors whose network size is above the sample median, or the acquirer firm CEO whose tenure at the acquirer's industry is below the sample median. Detailed definitions of these variables are provided in the Appendix. All regressions control for acquirer characteristics including acquirer board size, board independence, firm size, market-to-book ratio, leverage, and cash flow, deal characteristics including relative transaction value, toehold, deal competition, method of payment, whether the acquisition is diversifying or a tender offer, and the target firm's listing status. Models (8.5) and (8.6) further control for CEO characteristics, including CEO ownership, CEO age, and CEO gender. Finally, all regressions control for calendar year-fixed effects and industry (Fama-French 48 industry) fixed effects. The regression coefficients of these control variables are suppressed for brevity. P-values based on standard errors adjusted for firm clustering are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	[-1, +1] Acquirer CARs					
	(8.1)	(8.2)	(8.3)	(8.4)	(8.5)	(8.6)
IB director (%)	0.039*	0.046*	0.051**	-0.029	0.007	-0.062
	(0.092)	(0.057)	(0.041)	(0.479)	(0.262)	(0.492)
IB director (%) x Large deal	0.092**			0.124**		0.088*
	(0.019)			(0.010)		(0.083)
IB director (%) x Current experience		0.095**		0.089**		0.059
		(0.016)		(0.025)		(0.191)
IB director (%) x Large network			0.064*	0.033		0.091
			(0.087)	(0.383)		(0.321)
IB director (%) x Inexperienced CEO					0.127**	0.122*
					(0.028)	(0.061)
Acquirer characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Deal characteristics	Yes	Yes	Yes	Yes	Yes	Yes
CEO characteristics	No	No	No	No	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,465	2,465	2,465	2,465	771	771
Adjusted-R^2	0.076	0.071	0.069	0.079	0.133	0.145

Table 9

Acquirer buy-and-hold abnormal returns for subsamples

This table reports the acquirer median buy-and-hold abnormal returns (BHARs) across subsamples grouped by deal characteristics. Starting on the day after the acquisition announcement date, a buy-and-hold return is calculated for the acquirer for up to three years after the acquisition. We calculate the Fama-French adjusted BHARs by first regressing the five-year monthly returns leading up to merger events on the monthly Fama-French three factors and then use the estimated coefficients to calculate the acquirer's monthly abnormal returns before compounding. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels based on the Wilcoxon tests.

		Acquirer Fama-French adjusted buy-and-hold returns		
		IB director deal	Non-IB director deal	Difference
	Year	Median	Median	
All	1	-0.040	-0.070	*
(n = 2,465)	2	-0.067	-0.123	**
	3	-0.086	-0.157	***
Large deal	1	-0.026	-0.065	**
(n = 1,232)	2	-0.067	-0.174	***
	3	-0.085	-0.186	**
Small deal	1	-0.051	-0.076	
(n = 1,233)	2	-0.069	-0.090	*
	3	-0.088	-0.133	**
Cash	1	-0.034	-0.054	
(n = 1,016)	2	-0.048	-0.073	*
	3	-0.047	-0.097	*
Stock	1	-0.068	-0.072	
(n = 600)	2	-0.097	-0.147	*
	3	-0.062	-0.282	**
Mixed	1	-0.034	-0.103	**
(n = 849)	2	-0.104	-0.182	**
	3	-0.124	-0.221	**

Table 10

Regressions of takeover premium and financial advisory fees paid by acquirer

This table reports results of OLS regressions of the takeover premium and the advisory fees paid by acquirers. The full sample of acquisitions consists of 2,465 completed U.S. mergers and acquisitions between 1999 and 2008 as described in Table 3. To calculate the takeover premium, we further require the targets to be U.S. public firms. In Models (10.1) to (10.3), the dependent variable is the takeover premium calculated as the offer price relative to the target's share price four weeks prior to the acquisition announcement (PREM4WK) as reported by the SDC database. In model (10.4) to (10.6), the dependent variable is the natural logarithm of the dollar value of advisory fees paid by acquirers. Because a substantial number of deals either take place without the use of advisors or do not provide detailed fee information, to obtain a reasonably large sample, we do not require the target to be public in these tests. Definitions of the independent variables are described in the Appendix. All regressions control for calendar year-fixed effects and industry (Fama-French 48 industry) fixed effects whose coefficients are suppressed for brevity. P-values based on standard errors adjusted for firm clustering are reported in the parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Takeover premium			Log (advisory fees)		
	(10.1)	(10.2)	(10.3)	(10.4)	(10.5)	(10.6)
IB director (%)	-0.059	0.343	0.381	-1.350*	0.562	1.114
	(0.796)	(0.306)	(0.259)	(0.068)	(0.564)	(0.210)
IB director (%) x Large deal		-0.781**	-0.803**		-2.669**	-2.826**
		(0.024)	(0.029)		(0.026)	(0.017)
IB director(%) x Current experience			-0.168			-2.849**
			(0.466)			(0.019)
Acquirer Characteristics:						
Acquirer log (Assets)	0.007	0.006	0.006	0.096	0.139**	0.124*
	(0.627)	(0.732)	(0.841)	(0.106)	(0.049)	(0.080)
Acquirer market-to-book	0.011*	0.010	0.010	-0.038	-0.033	-0.032
	(0.074)	(0.101)	(0.138)	(0.190)	(0.271)	(0.269)
Acquirer leverage	-0.126	-0.111	-0.121	-0.734*	-0.800**	-0.709*
	(0.271)	(0.328)	(0.295)	(0.059)	(0.039)	(0.065)
Acquirer cash flow	-0.221	-0.195	-0.204	0.139	0.172	0.185
	(0.193)	(0.248)	(0.227)	(0.663)	(0.614)	(0.583)
Acquirer board size	-0.009	-0.008	-0.008	0.093	0.102	0.126
	(0.137)	(0.173)	(0.156)	(0.647)	(0.608)	(0.529)
Acquirer board independence	-0.009	-0.004	-0.005	0.024	0.019	0.024
	(0.884)	(0.952)	(0.931)	(0.173)	(0.254)	(0.178)
Prior acquisition experience	-0.051	-0.055	-0.056	-0.259**	-0.243**	-0.236**
	(0.303)	(0.272)	(0.265)	(0.019)	(0.027)	(0.030)
Target Characteristics:						
Target market-to-book	-0.009	-0.010	-0.009			
	(0.388)	(0.368)	(0.410)			
Target leverage	0.055	0.041	0.044			
	(0.604)	(0.696)	(0.675)			
Target cash flow	0.034	0.034	0.033			
	(0.329)	(0.318)	(0.033)			
Deal Characteristics:						
Relative transaction value	-0.011	-0.032	-0.031	0.618***	0.578***	0.577***
	(0.778)	(0.384)	(0.417)	(0.000)	(0.000)	(0.000)
Toehold	-0.069	-0.061	-0.049	0.005	-0.007	-0.021
	(0.389)	(0.426)	(0.520)	(0.987)	(0.981)	(0.944)
Competing offer	-0.081	-0.078	-0.085	0.165	0.221	0.209
	(0.184)	(0.181)	(0.152)	(0.522)	(0.379)	(0.415)

Stock deal	0.019	0.018	0.018	-0.091	-0.078	-0.059
	(0.689)	(0.695)	(0.700)	(0.479)	(0.546)	(0.649)
Cash deal	0.166***	0.151**	0.152**	-0.087	-0.036	-0.017
	(0.005)	(0.012)	(0.012)	(0.612)	(0.839)	(0.924)
Related deal	0.019	0.026	0.024	0.074	0.069	0.089
	(0.569)	(0.450)	(0.477)	(0.537)	(0.551)	(0.447)
Tender offer	0.006	0.014	0.012	0.092	-0.043	0.024
	(0.931)	(0.845)	(0.861)	(0.659)	(0.839)	(0.914)
Private target				-0.424	-0.386	-0.483
				(0.288)	(0.316)	(0.210)
Public target				0.013	0.038	-0.066
				(0.967)	(0.898)	(0.822)
Intercept	0.423***	0.411***	0.420***	-3.015***	-3.228***	-3.141***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	843	843	843	211	211	211
Adjusted-R^2	0.134	0.144	0.146	0.853	0.858	0.861

Table 11

Changes in operating performance

This table reports the median changes in operating performance of the merging firms. The sample of acquisitions consists of 2,465 completed U.S. mergers and acquisitions between 1999 and 2008 as described in Table 3. To calculate the target's pre-merger operating performance, we further require the targets to be U.S. public firms. We then calculated the change in operating performance of the merging firms from pre- to post-acquisitions for two subsamples grouped by the presence of IB directors on the acquirer's board at the time of acquisition announcement. The performance measure is calculated as the earnings before interest, tax and amortization expenses (EBITDA) scaled by sales. Changes in both the raw performance and the benchmark-adjusted performance are reported for 5 different event windows ranging from the one year prior to the acquisitions completion to one year, two years, three years, four years, and five years after the acquisition completion respectively. To obtain benchmark firms, we pair each acquirer and target firm with a set of matching firms following the procedure of Barber and Lyon (1996), which involves selecting firms with the same 2-digit SIC code in year 0 and operating performance within 90% to 110% of the sample firms' operating performance measures in year -1. Benchmark-adjusted performance is the calculated as the difference between the performance of sample firm and the median performance of matching firms. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels based on the Wilcoxon tests.

	IB director deals			Non-IB director deals		
Event windows	Number of deals	Raw performance	Benchmark-adjusted performance	Number of deals	Raw performance	Benchmark-adjusted performance
(-1, +1)	253	0.25	1.12*	423	-0.11	0.89
(-1, +2)	229	0.23*	1.10*	394	-0.82	0.63
(-1, +3)	187	0.44**	1.43**	350	-1.25	0.77
(-1, +4)	152	0.69**	2.08**	308	-0.44	1.38
(-1, +5)	123	1.16***	3.31***	265	-0.55	1.45