Information Conduit or Agency Cost: Top Management and Director Interlock between Target and Acquirer[1]

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Abstract:

This paper investigates the role of top management and board interlocks between target and acquirer in an acquisition. I hypothesize that an interlock serves as a conduit of information and personal experience hence the cost of gathering information for both firms is lower in interlocked deals. Interlock may also exaggerate agency problems due to the self-dealing behavior of interlock person and leads to value-decreasing acquisition. I find supporting evidence for the two non-mutually exclusive hypotheses. Consistent with the agency hypothesis, acquirers of interlocked deals on average underperform by 2% during announcement period, and are more likely to experience an extremely low 3-day CAR. However, when strongly governed, interlocked acquirers receive higher CAR and have better post-acquisition performance. Consistent with the information hypothesis, interlocked acquirers outperform both at announcement and in the long run if the value of target is opaque. They are also more likely to use equity as payment, especially in the case that the acquirer's stock value is opaque. Last but not least, I find acquisition is more likely to occur between two interlocked firms and such deals have a higher completion rate.

Key words:

Merger and Acquisition, Director Interlock, Information Asymmetry, Corporate Governance

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1. Introduction

Finance literature has shown that US public firms are pervasively interlocked through their board of directors, and the interlocks have significant economic consequence. The vast networks of connected officers and directors can contribute to agency conflicts if it increases manager entrenchment or leads to conflict of interest between connected firms. It may also help alleviate information asymmetry by serving as an intermediary to help management obtain information at a lower cost. I study the effect of interlock in the context of merger and acquisitions, an important corporate investment decision that has been plagued by both agency issues and incomplete information.

As a major corporate event, M&A decisions can lead to massive value creation or destruction for both the target and the acquirer. The decision-making and negotiation processes between acquirer and target are often long and complex, requiring top executives and directors in both firms to exert significant efforts.[2] When there is interlock formed between the acquirer and the target before M&A, that is, when a director of one firm serves as either a director or a top executive of another firm, it can complicate the potential agency conflict and change the information flow. In this paper, I identify an interlock between acquirer and target if one person has been employed by both companies as either officer, director, or both within 3 years prior to the announcement (year t), and is still employed by either acquirer or target in the year right

[2] Vafeas (1999) studies board meeting frequency and finds that boards meet more frequently when shareholders' interests are in potential danger, for example, during mergers, serial divestitures, and replacement for outgoing CEO. The highest number of board meetings frequency in his sample is by Santa Fe Pacific, which held 24 meetings during fiscal year of 1994, evaluating a merger with Burlington Northern, while the average board meets 7.45 per year.

before the merger (year t-1). Thus there are two types of interlocks: concurrent interlock and job hopper. This coding decision to use a 3-year window follows Stuart and Yim (2010).

Interlock may exacerbate agency problems due to two reasons. First of all, interlock leads to conflict of interest between the two firms that are connected. By definition, a concurrent interlock person has fiduciary obligation to shareholders at both firms. However when the two firms are involved in a corporate event like M&A, she may take actions in favor of one firm at the expense of the other. On the other hand, a job hopper may still keep her ties with the previous employer including stock ownership and personal connections with former colleagues, thus has incentive to act in favor of the previous employer at the expense of the current employer. In both cases, the personal connection generated from interlock makes it easier for acquirer executives and directors to collude with target management and make value-destroying acquisitions in pursuit of personal gains, such as empire-building or higher compensation (Jensen, 1986; Grinstein and Hribar, 2004; Harford and Li, 2007). The personal relationship may also hamper the interlocked officer's judgment and lead to flawed decision-making (Ishii and Xuan, 2010). In the meantime, interlocked target executives and directors are subject to the same bias when evaluating the bidding offers. They may not resist unfavorable bids hard enough, or after accepting the takeover bid, negotiate sweet deals for themselves, such as excess cash payment or positions in the combined firm, at the expense of the target shareholders (Hartzell, Ofek, and Yermack, 2004; Wulf, 2004).

The second reason why interlock exacerbates agency problem is that the personal connection established through interlocks gives managers leverage on labor market and reduces expected cost of potentially bad decision. As the early work by Mace (1971) quoted one director: "Here in

New York it's a systems club. They are all members of the Brook Club, the Links Club, or the Union League Club. Everybody is washing everybody else's hands." Bates and Wu (2011) find the number of directorship positions is positively correlated with the likelihood of target CEO obtaining a new job after takeover being completed. Therefore interlocks empower officers and lead to lower quality mergers.

Overall, I expect pre-merger interlocks exacerbate agency conflict and increase the probability that acquire and/or target firms pursue value-destroying mergers. Firms with strong governance may overcome the agency conflicts and improve deal quality.

Interlock can serve as an information conduit between the two firms it connects, which helps dealing with the two-sided information asymmetry problem in M&A. From an efficiency perspective, the private information about intrinsic value of firm asset can be revealed at a relative lower cost through interlocks. For example, Gulati and Westphal (1999) find that firms are more likely to form a joint venture, when they share outside directors and trustfully learn more about the reliability and management capabilities of potential venture partners. The literature mainly focuses on the role of interlock in facilitating the spread of corporate practice. It provides decision makers an opportunity to observe their peers' policies and the firsthand consequences, which includes acquisitions, poison pills, golden parachutes and option backdating, etc (Davis, 1991; Haunschild, 1993; Davis and Greve, 1997; Bizjak, Lemmon and Whitby, 2009).

Acquirer wants to learn about the true value of the target and make an appropriate offer; while target wants to know the potential synergy so as to negotiate for a higher premium in the bargaining process. These uncertainties about potential merger counterpart result in large search

cost. Bruner (2004) indicates that acquirers choose their targets in a search process that usually takes several months. Any factor reducing search cost or cost of due diligence is economically efficient. Gomper and Xuan (2008) find that sharing a common venture capital investor helps public acquirers and their private targets alleviate information asymmetry, and such acquisitions are associated with higher announcement returns. If interlock facilitates information exchange between the two firms, we expect similar effect. Hence based on the information hypothesis, I predict that interlocked bids are associated with better performance of the combined firm, both at announcement and in the long run. The benefit of having an interlock with the target will be higher if the target is more opaque.

This paper provides supporting evidence for both agency hypothesis and information hypothesis. Using a sample of 2194 bids between US public firms from 1991 to 2003, I identify 140 deals that are interlocked via top management or board of director[3]. I test the effect of interlocks on merger quality by examining the deal characteristics, the cross sectional variation in the announcement returns of acquirers and targets, and the post-merger performance of the combined firm.

Consistent with the hypothesis that interlock helps information transfer, I find interlocked mergers tend to have higher transaction value relative to the acquirer size and higher target Tobin's Q. These targets also have higher R&D expenditure and higher standard deviation of

[3] The literature largely focuses on director interlocks, and neglects the cases where a person serves as an executive in two firms simultaneously. Indeed this is less common than the case where the position with at least one of the firms is directorship. However such "executive interlock" is of same importance as, if not more than, a director interlock, in that a top executive is involved in operational management to a much higher extent. Therefore this paper investigates a general form of interlocks including this type of "executive interlock". All results hold if executive interlocks are excluded.

earnings forecasts from I/B/E/S. Relative deal value and pre-announcement Q of the target firm are correlated with the complexity of the transaction[4], while dispersion of earnings forecasts and high R&D signal information asymmetry. These evidences show severer information asymmetry on the target side. Moreover, interlocked mergers are more likely to use equity as the only payment method, which requires the acquirer to divulge more information about the synergy and value of the combined firm to the target. Interlocked bids also enjoy a higher rate of consummation and lower likelihood of target management hostility. The comparative statistics support the argument that interlock improves information transfer between the two firms, and facilitates deals that may not be completed or not even initiated otherwise.

I then investigate how interlock affects merger outcomes. After controlling for variables that have been shown to affect announcement returns, I find that around announcement day, the 3-day cumulative abnormal return for interlocked acquirers is 1.39% lower compared with other acquirers. The difference is both statistically and economically significant. Following Chen, Harford and Li (2007), I classify deal quality based on extreme market reaction. I find that interlocked deals are more likely be classified as a "bad deal", meaning the acquirer 3-day announcement CAR is in the bottom quintile. The acquirer and target's combined 3-day CAR is also significantly lower, ceteris paribus. No difference is found on the target announcement return or post-merger performance. Taken together, these results support the agency hypothesis that predicts interlock facilitates bad deals, and are consistent with Ishii and Xuan (2010) who

[4] Smith and Watts (1992) use market-to-book ratio of assets as a proxy for higher degree of the firm's growth opportunities. And target's pre-announcement growth opportunities are assumed to be private information, thus opaque to the acquirer (Bates and Lemmon, 2003).

find the negative impact of social ties exists only in acquirers and combined firms' announcement returns.

As a next step, I add the interaction term between interlock and acquirer governance to examine whether governance can alleviate the negative effect caused by interlock-related agency problems. Using director ownership as a measure of acquirers' governance[5], I find that the coefficient of the interaction term is significantly positive, indicating that when the acquirer is better governed, the existence of interlock is associated with higher deal quality. This evidence strongly supports the agency hypothesis, predicting that interlocks lead to value-destroying acquisitions on average, while good governance of acquirers mitigates the negative impact.

I further test the information hypothesis by including interaction term between information asymmetry measures and interlock. Based on the hypothesis, interlock will help alleviate information asymmetry problem, therefore when the target is opaque to the acquirer and information about the target is more valuable, the benefit of interlock is more pronounced. Consistent with this prediction, I find the interaction term between information asymmetry measures and interlock is significantly positive. For example, if the target is above industry median in terms of analyst earnings forecasts dispersion or R&D expenditure, the acquirers interlocked with such targets gain 3.8% more than the non-interlocked acquirers. The long-run effect is even more economically significant: the increase in ROA for the interlocked deals with less-transparent targets is 0.089 more than the non-interlocked deals, more than 3 times of the subsample mean.

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[5] The use of director ownership as a measure of acquirers' governance follows Lemmon and Whitby (2009).

In addition to the analysis of merger performance, I examine the relation between interlock and some other characteristics of M&A. An acquisition is more likely to occur and the transaction is more likely to be consummated if two firms are interlocked. If there are multiple bids, the interlocked bidder has a higher chance to win the auction. Last but not least, the interlocked acquirer is more likely to use stock as the only payment method, even more so if the acquirer stock value is opaque. In a nutshell, these additional evidence supports information hypothesis, which predicts that interlock facilitates the transactions that otherwise may not be initiated or completed due to high search cost or high standard of due diligence.

This paper contributes to a growing literature of board interlocks in finance that links financial activities and outcomes to managerial behavior. Existing empirical evidences support either the information hypothesis[6] or inefficiency hypothesis[7] (agency or behavioral). These papers find mixed evidence on the performance implications of interlocks. This study tests the two non-mutually exclusive hypotheses in M&A context and finds support for both.

Another strand of literature this paper is related to is M&A. Researchers have tried various merger or firm characteristics to explain the cross sectional variation in short-term and long-term wealth effect to both target and acquirer. For example, Bates and Lemmon (2003) find target announcement CAR is higher in deals with target termination fee provisions compared to deals without them, and lower in deals with acquirer fee provisions. Chen, Harford and Li (2007) show that concentrated holdings by independent long-term institutional investors lead to better post-

6 E.g. Haunschild (1993), Davis (1991), Davis and Greve (1997), Gulati and Westphal (1999), Bizjak, Lemmon and Whitby (2009), Stuart and Yim (2010)

7 E.g. Hallock (1997), Fich and White (2003), Larcker, Richardson, Seary and Tuna (2005).

merger stock and operating performance. Masulis, Wang, and Xie (2007) find that significantly lower acquirer CAR are associated with weaker corporate governance such as anti-takeover provisions, CEO-Chair duality, or operating in less competitive industries. This paper adds to this literature by showing the role that top management and director interlocks play in the M&A setting.

This paper is most related to Ishii and Xuan (2010), who test the impact of social ties between target and acquirer on merger outcomes. Instead of an explicit interlock between the two firms, they use educational background and past employment as proxy for social ties. Interlock can be regarded as a special form of social ties, nevertheless it implies an much stronger inter-firm connection. Another difference between the two papers is that I investigate the post-merger operating performance of the combined firm, which complements to announcement abnormal return as measure of merger quality. In addition to the univariate analysis applied in Ishii and Xuan (2010), I regress post-merger performance measures on a set of commonly accepted explanatory variables including measures of acquirer governance and target information asymmetry, and their interaction terms with interlock. The positive coefficient of interaction terms (0.146 and 0.089 respectively) and negative coefficient of interlock (-0. 146) indicate that the impact of interlock on post-merger performance is conditional on corporate governance and information asymmetry. This is consistent with the finding on acquirer CAR3.

Several other papers study the relation between interlocks and M&A. For example, Davis and Stout (1992) and Fligstein and Brantley (1992) find no evidence of a banker on board leading to a higher likelihood of engaging in merger activities, either as target or acquirer. Haunschild (1993) finds that firms' acquisition behavior is impacted by the practice of the firms

that they are linked to, i.e. if a firm is interlocked to another firm recently engaged in acquisitions, it is more likely to engage in acquisitions itself afterwards. Schonlau and Singh (2009) find that acquirers with well-connected boards are associated with better post-merger performance compared to those with less-connected boards. All these studies suggest that board interlocks affect firms' decision to acquire, the choice of their target, and the outcome of the merger. This paper is different from these studies in the sense that it specifically focuses on the interlock between the acquirer and its target instead of a general connection between the acquirer and any other firm.

The reminder of the paper is organized as follows. Section 2 describes the data and construction of variables. Section 3 presents the results from empirical test on the relation between interlocks and mergers performance and characteristics. In Section 4 I examine the above relation conditionally on corporate governance and information asymmetry. Section 5 presents additional empirical evidence including the relation between interlock and probability of acquisition, deal completion, and the choice of payment method. Section 6 concludes.

2. Data description and construction of the interlock variable

2.1 M&A sample formation

I start with a sample of 9657 bids with a US public target from the Mergers and Acquisitions Database maintained by SDC. Because the date range for management and board data in Compact Disclosure is 1988-2004, I require the bids to be announced between 1991 and 2003. The status of the deal is either completed or withdrawn. Any bid is excluded if coded as a divestiture, acquisition of remaining or partial interest, buyback, recapitalization, or exchange

offer. In order to focus on events with changes in control, I further require that the acquirer holds 30% or less of the target stocks prior to the announcement, and seeks 50% or more, leading to 9191 bids. Both target and acquirer are then matched with CRSP and COMPUSTAT databases for stock return and financial information, which reduces the sample size to 3852.

3324 of these bids have both target and acquirer covered by Compact Disclosure. Further dropped are the reverse mergers and the transactions in which the acquirer is in financial industry (SIC between 6000 and 6999) but target is not (3053 bids left). The latter restriction is to exclude the cases where the acquirer is the primary creditor of the target, and therefore a banker from the acquirer naturally sits on the target's board to monitor. In order to have a significant impact on the acquirer's value and performance, the relative deal value is required to be at least 5%, calculated as ratio of the transaction value relative to the acquirer's market equity 20 days prior to the announcement date. The final sample consists of 2194 bids.

Panel A in Table 1 shows the distribution of 2194 bids by announcement year. Between 1991 and 2003, the number of bids increased with the rising of the market, and dropped at the end of the 1990s. This trend is consistent with the observation in other studies, such as Moeller, Schlingemann, and Stulz (2004) and Chen, Harford and Li (2007). 140 bids are interlocked out of the full sample of 2194 bids (1738 completed and 420 withdrawn), without a significant time trend in the distribution across years. The highest percent of interlocked bids is 11% and lowest is 2% for 1993 and 1992, respectively. Panel B presents the distribution by target's industry. The industries with highest percent of bids being interlocked are Telecommunication and Health (11% and 10% respectively), while the industries with lowest interlock ratio are Chemicals and Finance (3%). Utilities as one of the two heavily regulated industries also has relatively small

number of interlock (4%). Unless specified, this paper includes year fixed effects and industry fixed effects in all regressions to control for potential systematic differences in time or industry. Inflation adjustments with 2000 as the base year are made where appropriate.

2.2 Interlock variable

The source of data on top management and board is the Compact Disclosure (a.k.a. Compact D/SEC) database. Compact Disclosure provides financial and management information extracted from 10-K and other SEC filings for over seven thousand firms, essentially the coverage of COMPUSTAT. With this coverage I can identify the interlocks between target and acquirer without losing lots of merger observations. Both firms are matched for a full list of executive officers and board directors with name, age, and title with the company. On average, a target firm has 8.4 executives and 8.3 directors in a sample year while an acquirer has 9.9 and 10 respectively.

An interlock is identified if one person has been employed by both companies as either officer, director, or both within 3 years prior to the announcement (year t), and is still employed by either acquirer or target in the year right before the merger (year t-1). As the primary measure of interlocks, I use an indicator variable set equal to 1 if the two firms share at least one common director/officer in the 3-year window.[8] Thus there are two types of interlocks: concurrent interlock and job hopper. In other words, the interlock person doesn't necessarily serve at both firms at the merger announcement. For example, an interlock person may be a target director

[8] Using the number of common persons yields similar results.

until year t-2, and serves as acquirer CFO the whole time. The coding decision of 3-year window follows Stuart and Yim (2010). The rationale is in line with the assumption that a director or executive should carry with her all the knowledge, personal experience, and connections from the previous employer, and further impact any acquisition decision involving the firm, even though the link between the previous employer and her current employer is not contemporaneous. Another underlying assumption is that past experiences will gradually lose relevancy to her current employer, i.e. the further away the link the smaller the relevancy is. The knowledge and connections with the old employer from 3 years ago are clearly more relevant than those from 10 years ago. Treating them as the same introduces noise to the measure. I also tried 2-year and 4-year windows, the results are robust yet a bit weaker.

Table 2 shows the distribution of bids by the number of interlocks. Among all 2194 bids, 140 have at least 1 interlock, collectively 6.38% of the full sample. The rest 2054 bids are non-interlocked. I exclude the bids with more than 3 interlocks, in which case the acquirer and target are usually related in some other way, such as target being acquirer's block holder or strategic alliance. This is not the interest of this paper since the existing fundamental relationship between two firms might be the primary factor of both information transfer and agency cost. Director interlock is more of a byproduct. The results in this paper are not sensitive to the inclusion of these bids.

3. Empirical results

In this section I present results from both univariate and multivariate analysis that investigate the relation between interlock and merger characteristics, as well as the wealth effect of interlock in terms of short-run and long-run merger performance.

3.1 Univariate analysis

Table 3 presents descriptive statistics of sample bids, comparing the subsample of interlocked bids to the non-interlocked subsample, which include 140 bids and 2054 bids respectively. Mergers with interlock have smaller target and acquirer but higher relative deal value, calculated as the transaction value divided by market capitalization of the acquirer at 20 days prior to announcement date. Interlocked bids also have higher pre-announcement Q of target firm. The Tobin's Q net of the industry median is 0.6 for interlocked bids, while only 0.22 for non-interlocked bids. Q is regarded as a proxy for the degree of growth opportunities (Smith and Watts, 1992). The higher pre-announcement Q of the target, together with the higher Relative Deal Value, implies a more complex transaction and more opacity in the acquirer's perspective about value of the target.

Acquirers interlocked to targets are more likely to use equity as payment method and less likely to use cash. There are 60% (9%) interlocked bids solely paid by equity (cash), compared to 50% (16%) of non-interlocked bids. Although it may not be able to benefit from paying with overpriced equity, the choice of equity as payment requires the acquirer to disclose more about the synergy and value of the combined firm (Moeller, Schlingemann and Stulz, 2007). In addition, an interlocked bid is also more likely to be received friendly by target management, to be completed, and the interval between announcement and deal completion is shorter. Most of these characteristics stated above are significantly different at 1% or 5% level. These findings

imply the existence of severer information asymmetry between the target and acquirer or higher cost of the asymmetry when the two firms are interlocked, therefore support the information hypothesis. The interlock person efficiently transfers information between the two firms, and facilitates the deal that may not be completed or not even initiated otherwise.

With respect to merger performance, announcement CARs for target and acquirer in non-interlocked bids are comparable to previous studies, 19% and –2.1% respectively. However acquirers in interlocked bids experience a lower CAR of -4%, an economically significant discount. Although CAR is a straightforward and market-based estimate of the wealth effect hence commonly used in M&A studies, Chen, Harford and Li (2007) argue that additional measures of deal quality are necessary. On the one hand, due to all the uncertainty over synergy, distribution of synergy, and resolution of the transaction to the outside investors, the stock price reactions to both firms at the announcement could be rather noisy (Bhagat, Dong, Hirshleifer, and Noah, 2005). On the other hand, bids that receive significantly negative reactions are likely to be truly bad deals (Paul, 2006). Therefore, to complement the 3-day CAR, this paper includes post-merger stock and operating performance measures, and constructs dummy variables to capture extreme stock reactions. Specifically, I follow Chen, Harford and Li (2007) to use the top and bottom quintiles of acquirer's 3-day CAR to define good deals versus bad ones. Good Deal is a dummy variable that takes the value of one if acquirer's 3-day CAR is in top quintile, and zero otherwise. Bad Deal is defined analogously. ΔROA is calculated as the changes in the 3-year average ROA from pre-merger corresponding measure. Both ROA and Q in this paper are net of the median of all firms with same 2 digit SIC code.

Besides lower acquirer's CAR, Table 3 shows that interlocked bids are associated with significantly higher likelihood of being an extremely bad deal but a larger increase in ROA. The announcement effects indicate that the market has negative reaction to the announcement of acquisitions with an interlock between target and acquirer. The seemingly inconsistent evidence on ΔROA is explained by further investigation in Section 4.

In general, the univariate analysis shows interlocked deals are the ones with more asymmetric information and of lower quality.

3.2 Multivariate analysis

Table 4 presents the cross-sectional regression results of different performance measures on the key variable: an indicator variable of interlock (hereinafter Interlock). Control variables are the ones commonly accepted as influencing merger performance, including firm size (logged book asset), Q, leverage, cash flow to asset, Relative Deal Value, indicator variables of 100% payment in equity or stock, whether target and acquirer are in the same industry (defined by 2-digit SIC code). Following Chen, Harford and Li (2007) I include ILTI dummy as a control variable, which is an indicator variable that equals 1 if the ownership of the top 5 independent long-term institutional shareholders in acquirer is among the top quintile. The announcement return regressions use the whole sample of 2194 bids, while post-merger performance regressions use the 1738 completed deals. All regressions include year and industry fixed effects. All variables are winsorized at the 1st and 99th percentiles except the indicator variables.

The findings from multivariate regressions are largely consistent to the agency hypothesis, i.e. interlocks lead to value destruction in the acquirer. The coefficient on variable Interlock is -0.013 in the first model with the acquirer's 3-day announcement abnormal return (CAR3) as

dependent variable. In other words, an interlocked acquirer receives a 1.4% lower return than a non-interlocked acquirer, ceteris paribus. This is a discount of almost 70% of the average unconditional CAR (-2.1%), hence is of economical significance. In addition, the likelihood that the acquirer's CAR3 is ranked into the bottom quintile, defined as "a bad deal" in Chen, Harford and Li (2007), is also 10.5% higher if the acquirer is interlocked to target through a director or executive (the marginal effect of logit model is not tabulated).

An alternative explanation of this negative impact of interlock on acquirer CAR is the wealth transfer between acquirer and target. To test this alternative hypothesis, the second column shows the effect of Interlock on target's CAR3. Consistent with Ishii and Xuan (2010), I don't find the interlock being significant in target's specification, therefore the negative impact of interlock on acquirer performance is not due to acquirer overpaying target. This is further confirmed in the regression of final merger premium paid to the target on Interlock[9]. The coefficient on Interlock is -0.027, statistically insignificant from zero (not tabulated). If the existence of interlock person makes the acquirer overpays the target due to self-dealing incentive or bias, the premium should be higher and target should have a higher announcement return, ceteris paribus. Similar to the findings in univariate analysis, post-merger performance measures do not appear to be impacted by the existence of interlock. The coefficient on Interlock in regressions of ΔROA is 0.002, statistically insignificant. In general the result is consistent with the notion that interlocks lead to value-reducing acquisition for bidder.

[9] Final premium is calculated as the final bid price per share from SDC divided by the target's stock price 42 trading days prior to announcement, less one.

4. Evidence on the two hypotheses

If interlock between target and acquirer leads to value-destroying merger decision due to agent's self-dealing behavior or cognitive bias, the acquirer's pre-merger governance should alleviate the agency cost by preventing low-quality deals from being announced or completed. On the other hand, the cross-sectional variation of the target's opacity would also affect the relationship between merger performance and interlock, if interlock efficiently transfers information from target to acquirer. This section investigates the wealth effect of interlock in these two aspects.

4.1 Interlock and corporate governance in acquirer

Following Bizjak, Lemmon and Whitby (2009), I use director ownership as a measure of corporate governance. Specifically, I construct an indicator variable taking the value of one if the pre-merger director ownership in the acquiring firm is above annual industry median, and zero otherwise. Intuitively, if the interest of acquirer directors is better aligned with that of the shareholders, the directors would have more incentive to monitor the management. And fewer value-reducing acquisitions would be observed. The data on director ownership come from combination of Compact Disclosure and IRRC, availability of which reduces sample size to around 1507. The construction of dummy variable follows Harford and Li (2007)'s measure of governance, who use an indicator variable Strong Board, set equal to one for firms whose CEOs' tenure is below median years. The purpose is to mitigate the noise contained in the excessive variation of director ownership or CEO tenure. All results hold if the continuous level of director ownership is used instead.

Table 5 presents the results from OLS regressions of different measures of merger performance on the key variable and control variables. The setting is similar to baseline models presented in Table 4, with 2 key variables introduced: the pre-merger acquirer governance and the interaction term between interlock and governance. The coefficients on the interaction term are significantly positive in regressions of acquirer's CAR3, combined CAR3, and accounting performance ΔROA. When the acquirer is strongly governed, an interlocked deal is associated with a higher acquirer CAR (7%) and higher combined CAR (5%), compared to a non-interlocked deal. Notably, coefficient on the interaction term is 0.14 in the model of change in ROA, significant both statistically and economically. This is more than 4 times as high as the sample mean (0.033). Compared to the insignificant coefficient on Interlock when no acquirer governance is controlled for, this result means the interlocked acquisition leads to a dramatically increased ROA only when the interest of board of director is well aligned.

These positive impacts on stock and operating performance can be explained as resulting from synergy of acquisitions that may not be initiated without an interlock due to asymmetric information. In contrast, a weakly governed acquirer suffers more when interlocked with the target. Acquirer's CAR3, combined CAR3, and ΔROA are 5.7%, 5.2%, and 8.9% lower than those in a non-interlocked deal. This is consistent to the prediction of agency hypothesis that if the board fails to monitor the acquisition behavior, the deal facilitated by the interlocked person destroys value. The estimates from logit regression with Good Deal and Bad Deal as dependent variable are consistent with that of acquirer's CAR3.

The evidence that good pre-merger governance of acquirer mitigates the negative wealth effect of interlocks supports the agency hypothesis. I have also used G-index as proxy for corporate governance, and the results are generally robust but are weaker.

4.2 Interlock and information asymmetry of target

I test the information hypothesis by including interaction term between information asymmetry measures and interlock in the regression of merger performance. If interlock helps transferring information about the target to the acquirer, it should be more valuable when the target value is opaque to the acquirer, the benefit of interlock should be more pronounced. Table 6 reports estimates from OLS regression including information asymmetry measures with acquirer's governance controlled. I use different measures for target information asymmetry in each panel. HighSTDEV and HighR&D are indicator variables with value of one if the target's standard deviation of earnings forecasts from I/B/E/S or R&D is higher than sample median, respectively, and zero otherwise.

Panel A shows that the acquirers interlocked to targets with higher dispersion in earnings forecasts gain 3.8% more than non-interlocked acquirers. The combined CAR3 for interlocked bids is higher by 4.3%. The long-run effect is even more economically significant: the increase in ROA for the interlocked deals with less-transparent targets is 0.089 more than the non-interlocked deals, more than 3 times of the subsample mean (0.029). The sign of interlock variable alone remains significantly negative, and the sign of the interaction term between acquirer's governance and interlock remains significantly positive. In Panel B, R&D is the proxy for target information asymmetry. The results are in general consistent with Panel A, except that combined CAR3 is now statistically insignificant. A possible explanation is that R&D can also

proxy for growth opportunities in target, therefore is by itself positively correlated with target announcement return (4.3%, significant at 5%). This is unrelated to the existence of interlock. Therefore the effect of interlock on combined CAR3 is diluted by the target and becomes insignificant. The long-run operating performance, in contrast, shows a larger difference between interlocked deals and non-interlock deals, when we compare the two panels.

The evidence supports the prediction that interlocks help alleviate information asymmetry between target and acquirer. There is thus a trade-off of cost and benefit for the acquirer to take over a target that it shares key personnel with.

5. Further Empirical Evidence on merger characteristics

To better understand the wealth effect of interlock between acquirer and target, I further test whether interlock is systematically correlated with some merger characteristics. I investigate if acquisition is more likely to occur between two firms sharing a common director/officer in the first place. I then test the relationship between interlock and rate of deal completion. Finally, I show the acquirers' equity is more often used as payment method in interlocked transactions.

5.1 Probability of Acquisition and Interlocks

Both agency hypothesis and information hypothesis predict that when searching for a potential buyer (seller), a firm is more likely to choose another firm that it is connected to. On the one hand, individual ownership and personal connections at the other firm give an interlock director/officer the incentive to vote for the other employer of hers. On the other hand, interlock may facilitate information transfer between the two firms therefore reduce the remarkable search

cost. In this section I follow Ishii and Xuan (2010) and calculate the expected rate of interlock between two firms, an indirect approach to test the relation between interlock and acquisition.

The first row of Table 7 represents the 2194 pairs of sample acquirer and target, 140 (6.38%) of them are identified as interlocked bids. For each bid, I associate the sample acquirer with a "random target", a firm random drawn from the sample target's industry (same 2-digit SIC code) in announcement year. The 2194 random-match pairs are then merged with director/officer dataset from Compact Disclosure and identified whether there is interlock between the two firms or not. This procedure is repeated for 500 times and Row (2) reports the average number and percentage of interlocks. There are 8.3 (0.38%) interlocks on average from the 500 iterations. Similarly, pairs of sample target and random acquirer are formed and 7.4 (0.34%) interlocks are identified out of the simulated sample. Row (4) represents simulated pairs of random acquirer and a random target, drawn from acquirer's industry and target's industry respectively.

As Ishii and Xuan (2010) argue in their paper, the statistics from Rows (2)-(4) measure the expected likelihood of interlock between two a potential acquirer and a potential target. And the matching approach takes into account of industry effect and year effect. Compare to their result that the observed level of social connection between actual acquirers and targets is more than twice as high as that between potential acquirers and targets, the evidence here on interlock is much stronger. The average ratio of interlock between potential acquirers and targets is only 0.21%, compared to 6.38% in the actual merger event sample. In other words, the occurrence of acquisition is strongly correlated with existence of interlock.

5.2 Interlock and the choice of payment method

In addition to its wealth effect, the interlock between target and acquire also impacts the choice of payment method, i.e. whether the acquirer chooses to use equity or cash or a mixture of both to pay the target. The empirical literature has found that overvaluation of its stock gives acquirer more incentive to do a stock deal. However from the target's perspective, if the acquirer's stock value is opaque to the target, the target may refuse to accept stock payment or require higher premium to compensate the potential loss. Therefore uncertainty about acquirer's stock value should be negatively related to the use of stock as payment, ceteris paribus. According to Information Hypothesis, the interlock reduces the information asymmetry between the two firms, which predicts a higher likelihood of seeing a stock deal when the two firms are interlocked. Agency Hypothesis has no clear prediction on this issue.

Table 9 shows the logit regression of the choice of payment method on Interlock dummy and control variables. The Interlock dummy is significantly positive baseline model, i.e. when the two firms share a common director/officer the likelihood of pure stock payment is higher by 14.9%. If the opacity of acquirer is included and interacted with Interlock, this positive effect is soaked up by the interaction term, indicating that the existence of interlock mostly help the acquirers that have difficulties to prove to the target the value of their stock. For those transparent acquirers, interlock does not increase the use of stock equity. Model (2) shows that interlock increases the likelihood of stock payment by 18.5% for opaque acquirer. The negative sign on acquirer's HighSTDEV is consistent with the intuition that targets are reluctant to accept acquirer's stock that analysts have very different forecasts on.

There is two-sided information asymmetry in a merger. Acquirer is also not sure about target's value thus wants to use its stock as contingent payment to the target to reduce any

expected loss from the acquisition. It is interesting to test if the interlock transfers non-public information about the target and further reduces the necessity of using stock as contingent payment. Model (3) includes target's HighSTDEV and the sign is positive, i.e. if target's future cash flow is opaque it is hard for the acquirer estimates the synergy, therefore the value of contingent payment is pronounced. The interaction term between target's HighSTDEV and Interlock is insignificant from zero.

The control variables has signs that are consistent with the previous literature: the acquirer is more likely to use equity as payment when it has less cash in hand, when the target is in high tech industries or its stock value is less predictable, when the relative deal value is not too large (a large deal usually involves mixed payment of both equity and cash), and when the two firms are in the same industry.

5.3 Interlock and deal completion

I also test whether interlocks exert influence to have the deal completed. Table 8 tabulates the coefficient estimates from logistic regression. The dependent variable is 1 if transaction is consummated and 0 otherwise.

The coefficient of interlock in the baseline model is 0.86, corresponding to an increase of 12.7% in the likelihood of deal completion if the two firms share director/executive. Model (2) shows that if there are multiple bids, the sample bidder is less likely to win the auction and complete the acquisition. However the interlocked bidder has a higher chance to win the auction by 23%. This is a significant difference both statistically and economically, implying less information asymmetry between two firms and lower due diligence standard. Model (3) and (4) include combined CAR and final premium. Both of them have positive sign but are not

significant when interacted with Interlock. This evidence shows that when merger performance is lower the existence of interlock does not help to stop a seemingly unprofitable transaction.

6. Conclusion

I investigate in this paper the role of top management and board interlocks between target and acquirer in an M&A setting. Two non-mutually exclusive hypotheses are developed. On the one hand, interlock person may serve as a conduit of information and personal experience between the two firms. Therefore the cost for both target and acquirer to gather information about each other is lower in interlocked deals. On the other hand, interlock may bring agency problems due to the reduction in board independence. In the context of merger and acquisition, the decision of acquisition is more likely to be value-destroying.

Supporting evidences are found for both hypotheses. I test the effect of interlocks on merger characteristics and outcomes, using a sample of 2194 bids between US public firms from 1991 to 2003, including 140 interlocked deals. Interlocked deals are more likely to use equity payment, to have higher Relative Deal Value, and higher-Q target. These characteristics are associated with severer information asymmetry, indicating that interlock person efficiently transfers information between the two firms, hence facilitates the deal that may not be initiated or completed otherwise

Consistent with the agency hypothesis, I find that acquirer's CAR3 is lower by 1.39% in an interlocked deal, ceteris paribus. This is not due to wealth transfer from acquirer to target. Interlocked deals are also associated with higher likelihood of being completed and likelihood that the acquirer's CAR3 is ranked into the bottom quintile. These evidences jointly support the

agency hypothesis that predicts interlock facilitates low-quality deals. A further investigation of whether the negative wealth effect of interlocks varies with governance level confirms the hypothesized self-dealing behavior. I include an interaction term between interlock and governance measure constructed from acquirer's pre-merger director ownership. When the acquirer is strongly governed, the existence of interlock is associated with higher acquirer's CAR3, higher combined CAR3, and better post-merger accounting performance, measured by change in ROA. Therefore, with existence of good acquirer governance, interlocks actually lead to better-matched deal due to the facilitated information transfer.

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Table 1: Distribution of bids by year and industry

This table presents the distribution of sample bids by announcement year and by target's industry. All 2194 bids are announced between 1991 and 2003, with transaction value at least 5% of the acquirer's market value of equity. Both the acquirer and target are US public firms covered by CRSP, COMPUSTAT, and Compact Disclosure. Interlocked bids are defined as the ones with at least one person employed by both firms as either director or top executive within 3 years before the announcement of the bid. Target's industry is defined by the Fama-French 12-industry classifications.

Panel A: Distribution of bids by year

Year	# of bids	# of interlocked bids	% of interlocked bids
1991	58	4	7%
1992	47	1	2%
1993	70	8	11%
1994	139	5	4%
1995	206	12	6%
1996	196	11	6%
1997	291	20	7%
1998	302	15	5%
1999	277	18	6%
2000	231	22	10%
2001	140	12	7%
2002	91	6	7%
2003	120	6	5%
sum	2194	140	6.38%

Panel B: Distribution of bids by target's industry

Industry	# of bids	# of interlocked bids	% of interlocked bids
1. NonDurables	74	6	8%
2. Durables	39	3	8%
3. Manufacturing	177	12	7%
4. Energy	87	4	5%
5. Chemicals and Allied	37	1	3%
6. Business Equipment	419	28	7%
7. Telecommunication	97	11	11%
8. Utilities	77	3	4%
9. Wholesale, Retail	175	12	7%
10. Health	214	21	10%
11. Finance	565	17	3%
12. Other	233	22	9%
sum	2194	140	6.38%

Table 2: Distribution of bids by number of interlocks between the target and acquirer

This table presents the distribution of bids by the number of interlocks. An interlock is defined as one person employed by both target and acquirer as either director or top executive within 3 years before the announcement of the bid. Presented first is the number of bids with a specific number of interlocks, followed by the percentage in all bids. Among all 2194 bids, 140 have at least 1 interlock, collectively 6.38% of the full sample. The rest 2054 bids are non-interlocked.

# of interlocks	Frequency	Percentage
1	103	4.69
2	34	1.55
3	3	0.14
sum	140	6.38
0	2054	93.62
sum	2194	100

Table 3: Sample Summary Statistics

This table presents summary statistics for the characteristics of 2194 bids as well as the targets and acquirers. An interlocked bid is one with at least one person employed by both target and acquirer as either director or top executive within 3 years before the announcement of the bid. There are 140 (6.38%) interlocked bids out of all 2194 bids. Target and acquirer characteristics are computed using firm data from the fiscal year immediately preceding the announcement date. Leverage is book value of debt divided by book value of asset (Compustat Data Item 6). Book Debt is defined as the sum of long-term debt (Item 9) and debt in current liabilities (Item 34). Cash flow is operating income before depreciation (Item 13). Tobin's Q is proxied by the market-to-book assets ratio, defined as the book assets (Item 6) plus the market value of equity (Item 199 times Item 25) minus book equity (Item 60) then divided by the book assets. ROA is Operating Income Before Depreciation (Item 13) over lagged book asset. Both Q and ROA presented here and used in regressions are the net of the industry median. R&D is R&D expenditure (Item 46) divided by book asset. STDDEV of forecasts is the standard deviation of analysts' earnings forecasts from I/B/E/S. ILTI dummy is an indicator variable that equals 1 if the ownership of the top 5 independent long-term institutional shareholders in acquirer is among the top quintile. Relative Deal Value is transaction value divided by equity market capitalization of the acquirer at 20 days prior to announcement date. Length is the number of days between the announcement date and the effective date. Toehold is the percent of ownership in the target by the acquirer at the announcement. Final premium is calculated as the final bid price per share from SDC divided by the target's stock price 42 trading days prior to announcement, less one. Diversifying, Multiple Bid, All Stock, All Cash, Tender Offer, complete, and Hostile are dummy variables that take the value of one for bids with targets in different industries defined by two-digit SIC code from the acquirer, if the bid is part of an auction consisting of more than 1 bid for the target, if only equity is used to pay for the acquisition, if only cash is used, if the bid is a tender offer, if the bid is completed, or classified as "hostile" by SDC respectively, and zero otherwise. Target and acquirer 3-day CARs are calculated over the event window [-1, +1]. Combined 3-day CAR is the average of target and acquirer CARs weighted by their market cap of two days prior to announcement. Good (Bad) Deal is a dummy variable that takes the value of one if acquirer's 3-day CAR is in top (bottom) quintile, and zero otherwise. All variables are winsorized at the 1st and 99th percentiles except indicator variables. ***, **, * denote statistical significance between the interlocked and non-interlocked subsamples at the 1%, 5% and 10% level, respectively.

Table 3 (continued)

	Mean			Median		
	Non-Interlocked bid	Interlocked bid		Non-Interlocked bid	Interlocked bid	
Frequency	2054	140		2054	140	
Acquirer Characteristics						
Book asset	7841	6551		1202	469	***
Leverage	0.213	0.214		0.189	0.155	
CF to Asset	0.089	0.061	**	0.100	0.093	
Q	0.624	0.868		0.069	0.072	
ILTI (dummy)	0.199	0.271	**			
R&D	0.077	0.129	***	0.036	0.042	
STDDEV of forecasts	0.032	0.034		0.025	0.03	
Target Characteristics						
Book asset	2258	1657		296	153	***
Leverage	0.209	0.200		0.163	0.135	
CF to Asset	0.057	0.008	***	0.085	0.072	*
Q	0.215	0.603	***	-0.017	0.036	
R&D	0.044	0.084	***	0.000	0.000	***
STDDEV of forecasts	0.031	0.035	**	0.025	0.03	*
Merger performance measures						
Target 3-day CAR	0.190	0.176		0.155	0.136	
Bidder 3-day CAR	-0.021	-0.041	***	-0.018	-0.031	*
Combined 3-day CAR	0.019	0.003	**	0.013	0.004	
Good Deal	20%	18%				
Bad Deal	19%	36%	***			
Δ ROA	0.029	0.085	**	0.002	0.006	
Bid Characteristics						
Deal value	1723	2188		276	245	
Relative Deal Value	46%	51%	*	36%	46%	*
Length	143	136		125	114	**
Initial premium	49%	50%		40%	39%	
Final premium	49%	47%		41%	39%	
AllStock	50%	60%	**			
AllCash	16%	9%	**			
Diversifying Merger	24%	24%				
Complete	82%	89%	**			
Hostile	5%	1%	*			
Tender Offer	15%	13%				
Toehold	4%	6%				
MultipleBid	10%	6%				

Table 4: Cross-sectional regression analysis of merger performance and interlock

This table presents Cross-sectional regression results. The announcement return regressions use the whole sample of 2194 bids, while post-merger performance regressions use the 1738 completed deals. Target, acquirer, and combined firm 3-day CARs (CAR3) are calculated over the event window [-1, +1]. Good (Bad) Deal is a dummy variable that takes the value of one if acquirer's 3-day CAR is in top (bottom) quintile, and zero otherwise. ΔROA is the difference between the post-merger 3-year average of industry-adjusted ROA and the pre-merger corresponding measure. Interlock is a dummy variable that take the value of one if there is at least one person employed by both target and bidder as either director or top executive within 3 years before the announcement, and zero otherwise. Target and acquirer characteristics are computed using firm data from the fiscal year immediately preceding the announcement date. Tobin's Q is proxied by the industry-adjusted market-to-book assets ratio. Leverage is book value of debt divided by book asset. Cash flow is operating income before depreciation (Item 13). ILTI dummy is an indicator variable that equals 1 if the ownership of the top 5 independent long-term institutional shareholders in acquirer is among the top quintile. Relative Deal Value is transaction value divided by equity market capitalization of the acquirer at 20 days prior to announcement date. Diversifying Merger, All Stock and All Cash are dummy variables that take the value of one for bids with targets in different industries defined by two-digit SIC code from the acquirer, if only equity is used to pay for the acquisition or if only cash is used respectively, and zero otherwise. Corresponding p-value is reported in the parentheses. ***, **, * Denote statistical significance at the 1%, 5% and 10% level, respectively.

	Acquirer CAR3		Target CAR3		Combined CAR3		Δ ROA		Good Deal		Bad Deal	
Interlock	-0.013	*	0.008		-0.014	*	0.002		-0.142		0.679	***
	(0.058)		(0.673)		(0.074)		(0.938)		(0.551)		(0.001)	
Log asset	-0.002	**	-0.005	*	0.000		0.004		-0.078	**	-0.006	
	(0.035)		(0.092)		(0.932)		(0.383)		(0.032)		(0.871)	
Q	-0.004	***	-0.016	***	-0.003	***	0.019	***	-0.011		0.079	***
	(0.000)		(0.000)		(0.003)		(0.000)		(0.733)		(0.010)	
Leverage	0.005		0.025		-0.006		-0.076		0.085		-0.537	
	(0.672)		(0.381)		(0.655)		(0.136)		(0.813)		(0.162)	
CF to Asset	-0.033	**	0.039		-0.013		-0.949	***	-1.032	**	0.336	
	(0.017)		(0.154)		(0.391)		(0.000)		(0.014)		(0.441)	
ILTI dummy	0.001		0.004		0.007		-0.019		0.004		-0.143	
	(0.867)		(0.699)		(0.140)		(0.309)		(0.980)		(0.347)	
Relative Deal Value	-0.032	***	-0.095	***	0.046	***	0.042	*	0.248		1.845	***
	(0.000)		(0.000)		(0.000)		(0.093)		(0.184)		(0.000)	
All Stock	-0.016	***	-0.032	***	-0.022	***	0.035	*	-0.091		0.755	***
	(0.000)		(0.004)		(0.000)		(0.050)		(0.520)		(0.000)	
All Cash	0.023	***	0.050	***	0.035	***	0.027		0.620	***	-0.783	***
	(0.000)		(0.001)		(0.000)		(0.267)		(0.000)		(0.002)	
Diversifying Merger	0.003		-0.006		-0.001		0.026		0.040		-0.178	
	(0.498)		(0.602)		(0.822)		(0.171)		(0.773)		(0.244)	
Year and Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted R2	7.6%		9.0%		9.5%		20.4%		7.9%		16.8%	
Num of observations	2194		2124		2155		1738		2194		2194	

Table 5: The effect of corporate governance on wealth effect of interlock

This table presents cross-sectional regression results controlling for corporate governance. The announcement return regressions use the whole sample of 2194 bids, while post-merger performance regressions use the 1738 completed deals. Target, acquirer, and combined firm 3-day CARs (CAR3) are calculated over the event window [-1, +1]. Good (Bad) Deal is a dummy variable that takes the value of one if acquirer's 3-day CAR is in top (bottom) quintile, and zero otherwise. ΔROA is the difference between the post-merger 3-year average of industry-adjusted ROA and the pre-merger corresponding measure. Interlock is a dummy variable that take the value of one if there is at least one person employed by both target and bidder as either director or top executive within 3 years before the announcement, and zero otherwise. Target and bidder characteristics are computed using firm data from the fiscal year immediately preceding the announcement date. DirOwn takes the value of one if the pre-merger director ownership in the acquiring firm is above annual industry median, and zero otherwise. Corresponding p-value is reported in the parentheses. ***, **, * Denote statistical significance at the 1%, 5% and 10% level, respectively.

	Acquirer CAR3		Target CAR3		Combined CAR3		Δ ROA		Good Deal		Bad Deal	
Interlock	-0.057	***	-0.049		-0.052	***	-0.089	**	-1.455	**	1.277	***
	(0.000)		(0.134)		(0.000)		(0.025)		(0.023)		(0.001)	
Interlock*DirOwn	0.070	***	0.052		0.050	***	0.144	***	1.497	**	-1.497	**
	(0.000)		(0.253)		(0.004)		(0.007)		(0.048)		(0.011)	
DirOwn	0.000		-0.012		0.004		-0.015		-0.069		0.032	
	(0.960)		(0.381)		(0.409)		(0.366)		(0.685)		(0.863)	
Log asset	-0.004	***	-0.006		-0.003	**	0.010	**	-0.120	**	0.060	
	(0.005)		(0.105)		(0.017)		(0.018)		(0.017)		(0.227)	
Q	-0.005	***	-0.017	***	-0.005	***	0.002		0.007		0.091	**
	(0.000)		(0.000)		(0.000)		(0.659)		(0.874)		(0.032)	
Leverage	0.003		0.012		0.002		-0.083	*	0.262		-0.802	
	(0.852)		(0.731)		(0.865)		(0.077)		(0.582)		(0.116)	
CF to Asset	-0.014		-0.003		0.005		-0.640	***	-0.422		0.388	
	(0.417)		(0.929)		(0.790)		(0.000)		(0.450)		(0.527)	
ILTI dummy	-0.008		0.001		-0.003		-0.013		-0.369	**	0.081	
	(0.111)		(0.956)		(0.563)		(0.439)		(0.046)		(0.664)	
Relative Deal Value	-0.039	***	-0.093	***	0.029	***	0.041	*	0.062		2.262	***
	(0.000)		(0.000)		(0.000)		(0.071)		(0.805)		(0.000)	
All Stock	-0.015	***	-0.042	***	-0.024	***	0.024		-0.097		0.736	***
	(0.001)		(0.001)		(0.000)		(0.132)		(0.589)		(0.000)	
All Cash	0.026	***	0.049	***	0.032	***	0.024		0.750	***	-1.175	***
	(0.000)		(0.004)		(0.000)		(0.244)		(0.000)		(0.001)	
Diversifying Merger	0.003		-0.004		0.002		0.012		0.056		-0.239	
	(0.542)		(0.800)		(0.666)		(0.507)		(0.757)		(0.243)	
Year and Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted R2	10.6%		8.4%		10.2%		12.3%		11.5%		22.4%	
Num of observations	1507		1462		1480		1218		1507		1507	

Table 6: The effect of information asymmetry on announcement effect of interlock

This table presents cross-sectional regression results controlling for information asymmetry. There are 140 (6.38%) interlocked bids out of all 2194 bids. Acquirer 3-day CARs (CAR3) is calculated over the event window [-1, +1]. Target, acquirer, and combined firm 3-day CARs (CAR3) are calculated over the event window [-1, +1]. Good (Bad) Deal is a dummy variable that takes the value of one if acquirer's 3-day CAR is in top (bottom) quintile, and zero otherwise. ΔROA is the difference between the post-merger 3-year average of industry-adjusted ROA and the pre-merger corresponding measure. Interlock is a dummy variable that take the value of one if there is at least one person employed by both target and bidder as either director or top executive within 3 years before the announcement, and zero otherwise. Target and bidder characteristics are computed using firm data from the fiscal year immediately preceding the announcement date. DirOwn takes the value of one if the pre-merger director ownership in the acquiring firm is above annual industry median, and zero otherwise. HighR&D and HighSTDEV are indicator variables with value of one if the target's R&D and the standard deviation of earnings forecasts higher than sample median, respectively, and zero otherwise. Corresponding p-value is reported in the parentheses. ***, **, * Denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 6 (continued)

Panel A: HighSTDEV as measure of information asymmetry

	Acquirer CAR3		Target CAR3		Combined CAR3		Δ ROA	
Interlock	-0.080	***	-0.070		-0.074	***	-0.146	***
	(0.000)		(0.108)		(0.000)		(0.001)	
Interlock* HighSTDEV	0.038	**	0.035		0.043	**	0.089	*
	(0.031)		(0.451)		(0.016)		(0.059)	
HighSTDEV	-0.005		0.004		-0.001		0.009	
	(0.327)		(0.767)		(0.837)		(0.546)	
Interlock*DirOwn	0.066	***	0.048		0.039	**	0.146	***
	(0.000)		(0.291)		(0.021)		(0.001)	
DirOwn	0.000		-0.012		0.005		-0.025	
	(0.953)		(0.365)		(0.298)		(0. 105)	
Log asset	-0.004	***	-0.006	*	-0.003	**	0.007	*
	(0.005)		(0.096)		(0.011)		(0.070)	
Q	-0.005	***	-0.017	***	-0.004	***	0.006	
	(0.000)		(0.000)		(0.001)		(0.105)	
Leverage	0.002		0.013		0.001		-0.080	**
	(0.899)		(0.718)		(0.914)		(0.044)	
CF to Asset	-0.013		0.000		0.002		-0.686	***
	(0.465)		(0.996)		(0.917)		(0.000)	
ILTI dummy	-0.008		0.000		-0.003		-0.009	
	(0.111)		(0.972)		(0.603)		(0.531)	
Relative Deal Value	-0.039	***	-0.093	***	0.030	***	0.032	*
	(0.000)		(0.000)		(0.000)		(0.098)	
All Stock	-0.015	***	-0.042	***	-0.021	***	0.018	
	(0.001)		(0.001)		(0.000)		(0.185)	
All Cash	0.026	***	0.049	***	0.031	***	0.024	
	(0.000)		(0.004)		(0.000)		(0.172)	
Diversifying Merger	0.003		-0.004		0.004		0.006	
	(0.627)		(0.793)		(0.486)		(0.676)	
Year and Industry fixed effect	Yes		Yes		Yes		Yes	
Adjusted R2	10.8%		8.3%		10.6%		20.0%	
Num of observations	1507		1462		1491		1218	

Table 6 (continued)

Panel B: R&D as measure of information asymmetry

	Acquirer CAR3		Target CAR3		Combined CAR3		Δ ROA	
Interlock	-0.085	***	-0.063		-0.068	***	-0.177	***
	(0.000)		(0.227)		(0.001)		(0.002)	
Interlock*HighR&D	0.038	*	0.019		0.025		0.103	*
	(0.072)		(0.721)		(0.237)		(0.083)	
HighR&D	0.007		0.043	**	0.008		-0.014	
	(0.268)		(0.011)		(0.217)		(0.409)	
Interlock*DirOwn	0.067	***	0.050		0.042	**	0.150	***
	(0.000)		(0.269)		(0.013)		(0.001)	
DirOwn	0.000		-0.011		0.006		-0.024	
	(0.973)		(0.402)		(0.275)		(0. 111)	
Log asset	-0.004	***	-0.006		-0.003	**	0.008	**
	(0.005)		(0.126)		(0.015)		(0.040)	
Q	-0.005	***	-0.017	***	-0.004	***	0.006	*
	(0.000)		(0.000)		(0.001)		(0.087)	
Leverage	0.004		0.015		0.003		-0.085	**
	(0.787)		(0.661)		(0.817)		(0.033)	
CF to Asset	-0.013		0.011		0.000		-0.699	***
	(0.451)		(0.744)		(0.979)		(0.000)	
ILTI dummy	-0.008		0.001		-0.002		-0.007	
	(0.117)		(0.950)		(0.644)		(0.637)	
Relative Deal Value	-0.039	***	-0.094	***	0.031	***	0.035	*
	(0.000)		(0.000)		(0.000)		(0.069)	
All Stock	-0.016	***	-0.041	***	-0.021	***	0.020	
	(0.001)		(0.002)		(0.000)		(0.145)	
All Cash	0.026	***	0.050	***	0.031	***	0.024	
	(0.000)		(0.004)		(0.000)		(0.164)	
Diversifying Merger	0.003		-0.003		0.004		0.005	
	(0.624)		(0.826)		(0.484)		(0.717)	
Year and Industry fixed effect	Yes		Yes		Yes		Yes	
Adjusted R2	10.8%		8.7%		10.5%		20.0%	
Num of observations	1507		1462		1491		1218	

Table 7: Probability of Acquisition and Interlocks

This table tests whether probability of acquisition is higher if the acquirer and target are interlocked. Two firms are defined as interlocked if there is at least one person employed by both target and bidder as either director or top executive within 3 years before the announcement. There are 140 (6.45%) interlocked bids out of all 2194 bids. The second column reports the total number of pairs where two firms are interlocked; and the third column reports the significance level of Row (2)-(4) from Row (1). Row (1) represents the 2194 pairs of acquirer and target in the event sample used in this study. Row (2) represents pairs of sample acquirer and a random target-match, which is a random firm with same 2-digit SIC code as the sample target in the acquisition announcement year. The summary statistics are based on procedure being repeated for 500 times. Row (3) represents pairs of sample target and a random acquirer-match. Row (4) represents pairs of a random acquirer-match and a random target-match. ***, **, * Denote statistical significance at the 1%, 5% and 10% level, respectively.

		# of interlocked bids	% of interlocked bids	Difference from (1)
Sample acquirers and targets	(1)	140	6.38%	
Sample acquirers and random targets	(2)	8.3	0.38%	***
Random acquirers and sample targets	(3)	7.4	0.34%	***
Random acquirers and random targets	(4)	4.7	0.21%	***

Table 8: Logistic regression analysis of deal completion and interlock

This table presents a logistic model of the relation between the probability of deal getting completed and the existence of interlock. The dependent variable is a dummy variable that take the value of one for bids that get completed, and zero otherwise. 1738 bids are completed out of the whole sample of 2194 bids. Interlock is a dummy variable that take the value of one if there is at least one person employed by both target and bidder as either director or top executive within 3 years before the announcement, and zero otherwise. There are 140 (6.38%) interlocked deals. Target and bidder characteristics are computed using firm data from the fiscal year immediately preceding the announcement date. Combined 3-day CAR is the average of target and acquirer CARs weighted by their market cap of two days prior to announcement. Toehold is the percent of ownership in the target by the acquirer at the announcement. Final premium is calculated as the final bid price per share from SDC divided by the target's stock price 42 trading days prior to announcement, less one. Marginal effect is provided in parentheses, as the change in the probability of deal completion for a one-unit increase in a non-indicator variable, or a shift from 0 to 1 for an indicator variable. ***, **, * Denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 8 (continued)

parameter	Basic		MultiBid		Combined 3-day CAR		Premium	
Intercept	-0.171		-0.433		-0.408		-0.509	
	(-0.025)		(-0.063)		(-0.059)		(-0.075)	
Interlock	0.864	***	0.611	*	0.826	***	1.622	**
	(0.127)		(0.090)		(0.119)		(0.240)	
Interlock*Multiple Bid			1.571	*				
			(0.230)					
Multiple Bid			-2.359	***	-2.362	***	-2.113	***
			(-0.345)		(-0.340)		(-0.313)	
Interlock*Combined CAR					0.636			
					(0.091)			
Combined CAR (3-day)					1.304	*		
					(0.187)			
Interlock* Premium							-1.202	
							(-0.178)	
Premium							0.602	**
							(0.089)	
Toehold			-1.489	***	-1.315	***	-1.165	***
			(-0.218)		(-0.189)		(-0.173)	
Tender Offer			0.939	***	0.912	***	1.081	***
			(0.138)		(0.131)		(0.160)	
Log asset	0.173	***	0.201	***	0.195	***	0.161	***
	(0.052)		(0.061)		(0.058)		(0.049)	
Q	0.028		0.045		0.044		0.013	
	(0.007)		(0.012)		(0.012)		(0.003)	
Leverage	-0.743	**	-0.823	**	-0.639		-0.762	
	(-0.020)		(-0.022)		(-0.016)		(-0.020)	
CF to Asset	0.199		-0.023		0.334		0.927	
	(0.004)		(0.000)		(0.007)		(0.019)	
ILTI dummy	0.016		0.051		0.085		0.229	
	(0.002)		(0.007)		(0.012)		(0.034)	
Relative Deal Value	-1.069	***	-0.901	***	-0.996	***	-1.067	***
	(-0.051)		(-0.043)		(-0.047)		(-0.052)	
All Stock	0.046		-0.010		0.028		0.040	
	(0.007)		(-0.001)		(0.004)		(0.006)	
All Cash	-0.348	*	-0.460	**	-0.526	**	-0.657	**
	(-0.051)		(-0.067)		(-0.076)		(-0.097)	
Diversifying Merger	-0.140		-0.153		-0.122		-0.257	
	(-0.020)		(-0.022)		(-0.018)		(-0.038)	
Year and Industry fixed effect	Yes		Yes		Yes		Yes	
Pseudo Rsq	11.2%		21.2%		21.5%		27.6%	
num of obs	2194		2194		2155		1382	

Table 9: Interlock and the choice of payment method

This table presents a logistic model of the relation between the choice of stock as payment method and the existence of interlock. The dependent variable is a dummy variable that take the value of one if the acquisition is paid in stock equity, and zero otherwise. 1111 bids are pure stock bids. Interlock is a dummy variable that take the value of one if there is at least one person employed by both target and bidder as either director or top executive within 3 years before the announcement, and zero otherwise. There are 140 (6.38%) interlocked deals. Target and bidder characteristics are computed using firm data from the fiscal year immediately preceding the announcement date. HighSTDEV is an indicator variable with value of one if the acquirer's (target's) standard deviation of earnings forecasts higher than sample median, and zero otherwise. Relative Cash is cash reserve divided by the transaction value of the deal. Runup is acquirer's stock price on day -42 divided by its stock price on day -2. Market Runup is the corresponding measure calculated using CRSP market index. Marginal effect is provided in parentheses, as the change in the probability of deal completion for a one-unit increase in a non-indicator variable, or a shift from 0 to 1 for an indicator variable. ***, **, * Denote statistical significance at the 1%, 5% and 10% level, respectively.

Parameter	Model (1)		Model (2)		Model (3)	
Intercept	-1.323		-0.982		-0.816	
Interlock	0.595	**	0.116		0.411	
	(0.149)		(0.029)		(0.103)	
HighSTDEV (Acquirer)			-0.206	*	-0.220	*
			(-0.052)		(-0.055)	
Interlock * HighSTDEV (Acquirer)			0.742	*	0.917	*
			(0.185)		(0.229)	
HighSTDEV (Target)					0.285	*
					(0.071)	
Interlock * HighSTDEV (Target)					-0.750	
					(-0.188)	
Relative Cash	-0.100	***	-0.092	**	-0.097	***
	(-0.080)		(-0.074)		(-0.078)	
Log asset	-0.012		-0.017		-0.024	
	(-0.006)		(-0.009)		(-0.012)	
Q	0.219	***	0.211	***	0.212	***
	(0.099)		(0.096)		(0.096)	
ILTI dummy	0.082		0.084		0.107	
	(0.021)		(0.021)		(0.027)	
Runup	0.126	*	0.131	*	0.129	*
	(0.031)		(0.032)		(0.031)	
Market Runup	0.773		0.766		0.797	
	(0.032)		(0.032)		(0.033)	
Diversifying Merger	-0.166		-0.179		-0.168	
	(-0.042)		(-0.045)		(-0.042)	
Multiple Bid	-0.784	***	-0.775	***	-0.769	***
	(-0.196)		(-0.194)		(-0.192)	
yr90s (dummy)	0.538	*	0.582	**	0.505	*

	(0.134)		(0.145)		(0.126)	
Tender Offer	-3.496	***	-3.502	***	-3.511	***
	(-0.874)		(-0.876)		(-0.878)	
Year and Industry fixed effect	Yes		Yes		Yes	
Pseudo Rsq	0.261		0.263		0.265	
num of obs	1906		1906		1906	