Interlocking Directors and Target Selection in Mergers and Acquisitions*

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Abstract

This paper investigates the role of interlocking directors in resolving the information asymmetry problems in mergers and acquisitions. I develop a private information model where having an interlocking director with the bidder increases the probability of being selected among potential targets. Consistent with the model, I find that interlocking firms are more likely to be selected as targets, particularly when there is greater information asymmetry regarding the target firm, or when the acquirer is financially constrained. The model also predicts that an interlocking potential target firm that is not selected is prone to bad performance. Supporting this prediction, I document that non-selected interlocking firms under-perform their peers. Finally, I show that target selection phenomenon is not driven by alternative explanations, such as network centrality, or entrenchment. Overall, the evidence suggests that interlocking directors mitigate inefficiencies that arise from information asymmetries in M&As.

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1 Introduction

The board of directors plays a very important role in mergers and acquisitions. Both the target firm's and acquirer firm's board of directors are decisive at the stages of selection, bidding and deal consummation. It is a very interesting phenomenon that in many deals, some board members contemporaneously sit on the boards of the target firm and the acquirer firm, yet our knowledge of these interlocking directors' effect is quite limited. This paper explores the role of interlocking directors in target selection in mergers and acquisitions (M&As) within an information asymmetry context.

A well documented friction in the M&A market, inspired by Akerlof (1970) and put forward by Hansen (1987), is information asymmetry regarding the target value: Target knows more about its value than the bidder. This results in an *adverse selection* problem, where bids are only accepted by targets with values less than or equal to the bid. Consequently, bidder faces an *overpayment cost* that is increasing in the value of the bid. Fishman (1989) notes that this leads to an efficiency problem because value-increasing bidders may be deterred from making offers.

Dual to the target-side information asymmetry, M&As induce information asymmetry regarding the bidder value: Bidder knows more about its value than the target (Hansen 1987). When bidder uses its equity to finance the acquisition, this results in an *adverse selection* problem. The reason is that raising equity to finance investments might be perceived by outside markets as an attempt to sell a lemon since firms would prefer to use their stock when it is overvalued (Myers and Majluf 1984). Hence, the use of equity rather than cash as means of payment would indicate a low valuation of the bidder stock, resulting in, as Eckbo, Giammarino, and Heinkel (1990) puts it, a *bidder undervaluation cost*.

Interlocking directors sit on the boards of the target and the acquirer firm during the acquisition process. Due to their position, they are privy to important information both about the target and about the acquirer firm. This access to information, along with the availability of direct communication with other decision makers (board members), makes interlocking directors a distinguished channel of information transmission between the parties involved in M&As. A straightforward question arises from this discussion: *Do interlocking directors, by communicating their privileged information during the M&A process, help resolve the information asymmetry problems explained above*? This paper attempts to answer this question.

I start by developing a simple model of target selection based on asymmetric information. The model's first prediction is that in most cases, the bidder will select the target on which

she has private information. To test this implication, I examine the extent to which bidders (acquirers) select the *interlocking firms* in actual M&As. I define the interlocking firms as all potential target firms that have at least one current director that is contemporaneously sitting on the board of the acquirer. I presume that these directors serve as a channel of private information transmission. Consistent with the model, I find that firms that have an interlocking director with the acquirer (interlocking firms) are more likely to be selected among potential target firms. The economic significance of the relation between interlocking directors and target selection is substantial. Conditioning on firms with similar industry and size characteristics, having an interlocking director with the acquirer raises the likelihood of becoming a target by 12 percent. The effect is robust across various industry classifications and firm characteristics that are used to define the set of potential targets.

As a next step, I document that interlocking director effect is more pronounced when information asymmetry in the target environment is greater, which implies a greater *overpayment cost* for the bidder. The increase in the probability of becoming a target is higher when targets are smaller, when targets experience worse past performance, or when targets have higher standard deviation of monthly stock returns. To the extent that private information is likely to be more valuable for targets with greater information asymmetries, this finding suggests that interlocking directors are better able to exploit their informational advantage when targets have opaque information environments. Interlocking director effect is also more pronounced when the bidder and the target are from different industries, which implies greater information asymmetry between the bidder and the target, but not necessarily a more opaque environment for the target. Moreover, I find that target premium paid by the acquirer is significantly smaller in interlocking deals. All these findings are consistent with the hypothesis that interlocking directors help resolve informational asymmetry problems regarding the target value.

In addition to target-specific information, interlocking directors may play a role in transmitting bidder-specific information. The method of payment (cash versus equity) in M&As has important consequences for the information revealed by the bidder and the target; hence for the deal outcome.[1] Many factors play a role in determining the method of payment in acquisitions. Cash offers may mitigate the adverse selection problem caused by acquirer's private information on her own stock. However, they may also exacerbate the adverse selection problem caused by target's information advantage in target valuation. Equity payment offers an advantage in limiting the overpayment cost by making the target partake in the bidder's gains and losses,

[1] See Hirshleifer (1995) for an in-depth analysis.

whereas also introducing a bidder undervaluation cost.[2] Tax issues are important factors as well, the amount of equity and cash effects the tax shield and timing of the acquisition. For all these reasons, it is not clear which method of payment the acquirer would prefer in M&As. However, financially constrained firms are unlikely to easily raise capital, hence might be obliged to choose equity financing. If we believe that these constrained firms will necessarily use their stock to finance acquisitions, we would expect such firms to select a target that knows better about its valuation so as to avoid the *bidder undervaluation cost*. Indeed, I find that acquirers are more likely to select interlocking targets when they are highly leveraged, or cash-strapped, or constrained in liquidity. This is consistent with the hypothesis that interlocking directors help resolve informational asymmetry problems regarding the acquirer value.

Modeling target selection as a function of private information provides a second prediction. According to the model, if the private information on an interlocking potential target is negative, the bidder will select the non-interlocking target as long as the synergy value is above some threshold. Therefore, in an actual merger, if a non-interlocking target is selected when an interlocking potential target firm exists, we can infer that the private information regarding the interlocking firm is negative; or, at least, weaker than that for the other potential target firms. We would expect the negative news about the interlocking firm to come out after some time. I test this hypothesis and find support for this prediction as well. I document that interlocking firms, that are not selected in deals where a non-interlocking target is selected, have worse post-deal announcement performance with respect to their peers. This is observed through a deterioration in the accounting and stock market performance of the non-selected interlocking firms. This provides further evidence on the idea that informational superiority of the interlocking director benefits the bidder in selecting an appropriate target.

As a final step, I test for alternative explanations that could generate similar empirical patterns and show that the main results still hold. For example, an interlocking firm may be more likely to be chosen as a target simply because this firm is more central in the network of directors; hence the existence of interlocks. More central firms, due to their busy directors, may under-perform (Fich and Shivdasani 2006) and tend to become takeover targets (Barber, Palmer, and Wallace 1995; Cremers, Nair, and John 2009; Hasbrouck 1985; Morck, Shleifer, and Vishny 1988). If this were the first order effect, then controlling for busy directors would make the interlocking director effect disappear. Another possible explanation of the empirical facts may come from the entrenchment theory (Bebchuk, Cohen, and Ferrell 2009; Gompers,

[2]The bidder faces a tradeoff between the likelihood of paying too much, or of offering too little and being rejected. Equity makes the terms contingent on the target's value, hence target shares some of the overpayment cost with the bidder.

Ishii, and Metrick 2003). According to this theory, the interlocking directors might facilitate merger process not because of informational reasons, but because they act as negotiators so as to prevent anti-takeover defenses. If this were the case, first, we would expect a strong presence of anti-takeover defense measures in these potential targets. Second, under this explanation, interlocking director effect should be stronger for highly entrenched target firms. Finally, we would expect that controlling for corporate governance variables weakens the results regarding the interlocking directors. I show that my results are robust to these alternative explanations.

This paper contributes to the literature by shedding new light on the role of the interlocking directors in M&As. The literature has traditionally focused on the effect of network centrality on firm actions and performance, where network centrality is defined with respect to interlocking directors. For example, Schonlaua and Singh (2009) show that central firms do better performing acquisitions. They also find that central firms are more likely to use cash, to make an acquisition, and to be acquired. Stuart and Yim (2010) document that firms that have interlocking directors with firms that previously experienced a private equity deal are more likely to receive private equity offers. Similarly, Bouwman and Xuan (2010) find that a firm is more likely to engage in M&As, among other financial activities, if it has interlocking directors with firms that engage in the same activity. However, these papers focus on the transmission of experience and know-how through interlocking directors; they do not consider target or acquirer-specific information as they do not look at the direct connection between the actual target and acquirer. This paper, on the contrary, considers the transmission of firm-specific information that is critical to target choice.

This paper further contributes to the M&A literature by focusing attention on the initial stage of an acquisition: *target selection*. There are some studies on merger pairings in the literature, that do not take a stand on who initiates the deal.[3] For example, Rhodes-Kropf and Robinson (2008), by comparing actual mergers to hypothetical mergers pairings of randomly chosen non-merging firms, find that the market-to-book spreads are tighter in actual mergers than in hypothetical mergers. However, the significance of private information in merger pairings has been overlooked. To the best of my knowledge, this is the first study that models target selection process in an asymmetric and private information context, and provides empirical evidence on it.

[3]Xie (2010) documents detailed information on the private bargaining process for 598 deals covering the period 2000-2004, and finds that most negotiation deals are initiated by the acquirers. Therefore, analyzing a period where the bidder (acquirer) selects a target from a number of alternatives before making a bid is reasonable.

The most relevant study to this paper is that of Cai and Sevilir (2012) who examine the *performance* of *completed* M&A transactions between firms with interlocking directors. Unlike the previously mentioned studies, they analyze the transactions where there is a direct board connection between the parties involved in M&A. They find that acquirers significantly obtain higher announcement returns in interlocking deals; and relate this to the acquirer's ability to pay lower takeover premiums and lower advisory fees in such transactions. Although Cai and Sevilir (2012) suggest that acquirer's information advantage can explain the empirical facts, they do not have information asymmetry variables in their study. My finding that higher information asymmetry regarding the target value significantly increases the effect of the interlocking directors complements their study.

The paper is organized as follows. First, I build a model of target selection and derive its empirical implementation. This is presented in Section 2. Section 3 describes the data and offers some descriptive evidence. Section 4 analyzes the impact of interlocking directors on the probability of becoming a target, with an emphasis on information asymmetry. Section 5 discusses the effect of interlocking directors on deal structure. The performance of non-selected interlocking firms are analyzed in Section 6. Robustness checks are provided in Section 7. Section 8 concludes.

2 Empirical Research Design

2.1 The Model

In this section, I present a simple model that motivates my empirical tests. The model is based on the idea that the interlocking directors provide an important channel for information transmission between the parties involved in M&As.

The model has three strategic players: One bidder and two potential targets. Targets can be of two possible types. One type, which I refer to as *high-value target*, has a stand-alone value of v_H, while the other type, referred to as *low-value target*, has a stand-alone value of v_L, where $v_L < v_H$. The likelihood that the target is of high-value type is q. I assume that the merger creates a synergy value of $w > 0$, which does not depend on the type of the target.

The sequence of events is as follows. At $t = 0$, targets' types are determined independently from each other and targets learn their own types. At $t = 1$, bidder receives a private signal on

the type of one of the targets, which I refer to as the *acquainted target*. Similarly, since the bidder does not have private information on the other target, I will label it as the *unacquainted target*. The signal, $\eta \in h, l$ has quality $1/2 < \phi < 1$, defined as $\phi = Pr(\eta = h|v_H) = Pr(\eta = l|v_L)$.[4] I assume that making an offer is costless; but the bidder can make at most one acquisition offer. At $t = 2$, bidder submits a take it or leave it offer with price p to one of the targets; or does not make an offer. If the bidder does not submit an offer, the game ends. If the bidder submits an offer, at $t = 3$, the selected target's board accepts or rejects the offer, and the game ends.

First, note that bidder's ex-ante valuations of both targets is the same: $E[v_1] = E[v_2] = \overline{v} = qv_H + (1-q)v_L$. Upon observing the private signal, bidder forms a posterior on the type of the acquainted target by Bayesian updating. Specifically:

$$Prob(v_1 = v_H|\eta = h) = \frac{q\phi}{q\phi+(1-q)(1-\phi)} = \Phi_H$$

$$Prob(v_1 = v_L|\eta = h) = 1 - \Phi_H$$

$$Prob(v_1 = v_L|\eta = l) = \frac{(1-q)\phi}{(1-q)\phi+(q)(1-\phi)} = \Phi_L.$$

$$Prob(v_1 = v_H|\eta = l) = 1 - \Phi_L$$

If the bidder offers $p < v_L$, no potential target will accept the offer. So, we can restrict our attention to offer prices where $p \geq v_L$ without loss of generality. Note also that the synergy value is positive, so the bidder will always submit an offer, even though the offer price may be low.

To solve the model, I proceed by backward induction and obtain the expected profits from optimum offers to each potential target. It is straightforward to start with the unacquainted target as the bidder does not receive any private signal regarding this target, hence there is no Bayesian updating. The profit maximizing bid for the unacquainted target and expected profits are summarized in the below lemma.

Lemma 1. *If the bidder selects the unacquainted target:*
(i) If $\frac{w}{v_H - v_L} \geq \frac{(1-q)}{q}$, *the bidder will offer* $p = v_H$ *and obtain expected profits of* $w - [(1-q)(v_H - v_L)]$.
(ii) Otherwise the bidder will offer $p = v_L$ *and obtain expected profits of* $(1-q)w$.

Proof. See Appendix 1. ■

[4]The signal is imperfect, i.e. $\phi < 1$. In the case of perfect signal, the acquirer always selects the acquainted target, makes an offer equivalent to the stand-alone value of the target and obtains profits equal to the synergy value.

Intuitively, the bidder has to compare the benefits and the costs of bidding. A high bid induces high probability of success, hence higher expected *synergy gains* (w). However, it also implies high expected *overpayment cost* ($v_H - v_L$) since bids are only accepted by targets with values less than or equal to the bid. When the synergy value is high relative to the cost of overbidding, the acquisition is attractive for the bidder. The bidder is less cautious about overbidding, and submits a high value offer to realize the synergy gains. When the synergy value is relatively low, overbidding is too costly; and the bidder submits a low value offer.

Note that I characterize the optimum offer with respect to the ratio of the synergy value to the difference between high and low valuations, i.e. $\frac{w}{v_H - v_L}$. This variable captures the *attractiveness of the acquisition* from the bidder's point of view. A bidder will bid more aggressively as the synergy value increases; or as the cost of overbidding decreases.

The analysis is more complicated for the acquainted target since the bidder receives a private signal regarding this target. After the Bayesian updating, the bidder will submit an offer depending on the signal. The profit maximizing bid for the acquainted target and expected profits are summarized in the below lemma.

Lemma 2. *If the bidder selects the acquainted target and the signal is high ($\eta = h$):*
(i) If $\frac{w}{v_H - v_L} \geq \frac{(1-\Phi_H)}{\Phi_H}$, the bidder will offer $p = v_H$ and obtain expected profits of $w - [(1 - \Phi_H)(v_H - v_L)]$, where $\Phi_H = \frac{q\phi}{q\phi + (1-q)(1-\phi)}$.
(ii) Otherwise the bidder will offer $p = v_L$ and obtain expected profits of $(1 - \Phi_H)w$.
If the bidder selects the acquainted target and the signal is low ($\eta = l$):
(i) If $\frac{w}{v_H - v_L} \geq \frac{\Phi_L}{(1-\Phi_L)}$, the bidder will offer $p = v_H$ and obtain expected profits of $w - [\Phi_L(v_H - v_L)]$, where $\Phi_L = \frac{(1-q)\phi}{(1-q)\phi + (q)(1-\phi)}$.
(ii) Otherwise the bidder will offer $p = v_L$ and obtain expected profits of $\Phi_L w$.

Proof. See Appendix 1. ■

The intuition is identical to the previous case, except that the private signal changes the levels of thresholds. The solution, i.e. target selection and the offer value, will be determined by a comparison of the expected profits of the bidder established in the above lemmas. I present the summary of results in the following proposition.

Proposition 1. *If the bidder receives a high signal ($\eta = h$):*
(i) If $\frac{w}{v_H - v_L} \geq \frac{1-\Phi_H}{q}$, the bidder will offer $p = v_H$ to the acquainted target and obtain expected

profits of $w - [(1-\Phi_H)(v_H - v_L)]$, *where* $\frac{1-\Phi_H}{q} = \frac{(1-q)(1-\phi)}{q[q\phi+(1-q)(1-\phi)]}$.
(ii) Otherwise the bidder will offer $p = v_L$ *to the unacquainted target and obtain expected profits of* $(1-q)w$.
If the bidder receives a low signal $(\eta = l)$*:*
(i) If $\frac{w}{v_H - v_L} \geq \frac{1-q}{1-\Phi_L}$, *the bidder will offer* $p = v_H$ *to the unacquainted target and obtain expected profits of* $w - [(1-q)(v_H - v_L)]$, *where* $\frac{1-q}{1-\Phi_L} = \frac{(1-q)[(1-q)\phi+q(1-\phi)]}{q(1-\phi)}$.
(ii) Otherwise the bidder will offer $p = v_L$ *to the acquainted target and obtain expected profits of* $\Phi_L w$.

Proof. See Appendix 1. ■

The following table illustrates the model's predictions on target selection.

	Level of attractiveness of the acquisition for the bidder $(\frac{w}{v_H - v_L})$		
	Low $(0 \to \frac{1-\Phi_H}{q})$	Medium $(\frac{1-\Phi_H}{q} \to \frac{1-q}{1-\Phi_L})$	High $(\frac{1-q}{1-\Phi_L} \to \infty)$
Low signal $(\eta = l)$	Acquainted target	Acquainted target	Unacquainted target
High signal $(\eta = h)$	Unacquainted target	Acquainted target	Acquainted target

In most of the cases, the bidder will find it more profitable to submit a bid for the *acquainted target*. The reason is that the bidder has valuable private information on the value of the acquainted target. The bidder will exploit this information in a way to maximize the expected value of the profits, which depends on the probability that the target accepts the offer. If the signal is high, the bidder will submit a high value offer; and if the signal is low, the bidder will submit a low value offer.

Only when there is a strong contradiction between the level of attractiveness of the acquisition and that of the signal, will the bidder make an offer to the unacquainted target. One case is

when the acquisition is highly attractive, but the bidder receives a low signal on the valuation of the acquainted target. In this case, the synergy value is high enough to compensate for the possibility of overbidding so that the bidder wants to make a high value offer. However, as signal reveals that the acquainted target has a lower probability of being a high-value target, the bidder will find it more profitable to make an offer to the unacquainted target. Alternatively, upon receiving a high signal when the acquisition attractiveness is very low, the bidder will select the unacquainted target. In this case, the bidder will tend to make a low value offer so as to avoid relatively very high overbidding costs, and the probability of offer acceptance is higher for an offer to the unacquainted target.

2.2 Empirical Implementation

In this section, I describe the empirical research motivated by the model. As noted in the previous section, the model predicts that in most cases, the bidder selects the acquainted target to make an offer. Empirically, this corresponds to bidders selecting interlocking firms, as in such cases bidders are privy to important information on targets through interlocking directors. The *only* cases where the bidder selects the unacquainted target correspond to strong contradictions in the attractiveness of the acquisition and bidder's private information. Given this, I put forward the following hypothesis.

Hypothesis 1. *A bidder is more likely to select an interlocking firm among potential target firms.*

Next, I examine whether interlocking director effect is particularly strong for target firms with higher information asymmetries. Note that the noisy signal received by the acquirer reduces the information asymmetry between the target and the acquirer. When the impact of information asymmetry in target environment is more relevant, i.e. for example when $v_H - v_L$ is larger, the value of this private information will be higher. Given that interlocking directors can serve as transmitters of private information, hypothesis 2 follows.

Hypothesis 2. *The positive effect of interlocking directors on target selection will be stronger when the information asymmetry regarding the target firm is high.*

Even though the model refers to information asymmetry regarding target value, the M&A

literature is also concerned with information asymmetry regarding acquirer value. My third hypothesis considers this line of research.[5] Following insights from the literature, I conjecture that financially constrained firms are likely to be obliged to use their stock for acquisitions. In these situations, as bidder undervaluation costs will arise, being able to transmit private information on her own value to the target will benefit the bidder. Considering interlocking directors as transmitters of such information offers the following hypothesis.

Hypothesis 3. *The positive effect of interlocking directors on target selection will be stronger when the bidder is financially constrained.*

My final hypothesis relates directly to the predictions of the model regarding the non-selected targets. Note that the model provides two cases where the bidder selects the unacquainted target. One of these cases is where the attractiveness of the acquisition is very high, however, the signal is low. The second case is where the signal is high but attractiveness of the acquisition is so low that the bidder avoids submitting a high value bid. Empirically, we observe situations where an interlocking firm looses against a non-interlocking firm in target selection. In terms of the model, either one of the two cases must hold for these situations. Given that making a bid requires the bidder to incur further costs due to advisory, reputational or other related issues; empirically, it is unlikely that the bidder submits a bid when the attractiveness of the acquisition is very low. Therefore, I conjecture that the selection of the non-interlocking firm is most likely to correspond to the case where the bidder receives a signal pointing to a low valuation of the acquainted target firm. As one would expect the negative news on the acquainted firm to come out by time, the last hypothesis follows.

Hypothesis 4. *Among the potential target firms, if the bidder selects a non-interlocking firm, the non-selected interlocking firm will under-perform its peers throughout time.*

[5] Information asymmetry on bidder value will be incorporated to the model in the future version of the paper.

3 Data and Descriptive Statistics

3.1 M&A and Directors Data

I obtain the initial M&A sample from the Securities Data Company's (SDC) Mergers and Acquisitions Database. Data regarding board of directors come from the Compact Disclosure CD-ROMs and Riskmetrics Directors database. I obtain the stock price data from University of Chicago's Center for Research in Security Prices (CRSP) daily files; and company financial data from Compustat annual files. Table 1 records the detailed sample selection process.

[Insert Table 1: Sample Selection]

Due to data limitation with respect to company directors, I set the sample period from January 1, 1996 to December 31, 2005 by the announcement date.[6] I require that all M&As are between U.S. public companies and that the acquirer is seeking to own at least 50% of the shares of the target company after the transaction. I only consider deals with a minimum of $ 5 million transaction value. I exclude the deals that are intended (where there is no actual bid) or deals that are still pending. I further exclude self tenders, division sales and bankruptcy process deals because these are not M&As in the traditional sense. I do not consider deals where the acquirer is already a majority owner as in these deals, target is already under the control of the acquirer. Similarly, I exclude the deals where the target and the acquirer belong to the same parent company. Finally, I delete the duplicate entries.[7] This process results in a sample of 3,408 M&As.[8]

Even though both the target and the acquirer are identified as *public* by SDC database, many companies in this M&A sample do not have data available at CRSP on the deal announcement date.[9] This is mainly due to the stock of the company being delisted from the stock exchange before the announcement date. To eliminate companies that do not have available stock market data, I merge my M&A sample with CRSP daily files. I end up with a sample of 2,752 M&As.

[6] I obtain data on directors from Compact Disclosure and Riskmetrics Directors databases. The intersection of these databases covers the period 1996-2005.

[7] There are four duplicate entries (SDC deal numbers: 555019020, 575222020, 656812020 and 1433365020) which are previous versions of correctly updated entries.

[8] My sample selection closely follows Luo (2005).

[9] If the deal announcement takes place on a public holiday, I replace the announcement date with the subsequent day when the markets are open.

Note that this is also a required step to later identify the U.S. public companies that are potential targets.

At this stage, I would like to identify interlocking directors between any two companies, not only for the companies in the M&A sample, but also for other similar U.S. public companies. This would enable me to match each actual bidder from the M&A sample with potential targets and assess board connections. For this purpose, I create a comprehensive data set of directors using two different sources.

My basic source of directors data is Standard and Poor's (S&P) Compact D/SEC (popularly known as Compact Disclosure) CD-ROMs. These CD-ROMS are updated each month, and include financials and text information extracted from 10-K reports, proxy statements and other company filings. This database covers all companies that file with the U. S. Securities and Exchange Commission (SEC) and that have assets in excess of $5 million. The relevant variables for my analysis are the name, age and title of company directors. Additionally, this database provides the same type of data on company officers, and for the reasons that will become clear in the following paragraphs, I include also officers data in my study. Compact Disclosure extracts information on directors mainly from proxy statements whereas information on officers come from 10-Ks. Since 10-K and proxies are required to be filed annually by companies, I use the June CD-ROMs to produce my data set.[10] Unfortunately the publication of Compact Disclosure CD-ROMs has been ceased in 2006, hence I set my sample period end as December 31, 2005.

My second source of directors data is Riskmetrics Directors database. This database covers mainly S&P 1500 companies from the year 1996 onwards and provides data on the identity and characteristics of board directors. Riskmetrics obtains information from annual board meetings of companies. Because they are large public companies that file with the SEC, the companies in Riskmetrics Directors database are covered by Compact Disclosure CD-ROMs. However, not all directors of Riskmetrics database are included in Compact Disclosure database as the latter database do not list all directors after some threshold number. Supplementing Compact Disclosure data with Riskmetrics data enables me to correctly classify many companies as interlocking

[10]This is the commonly used approach in the literature for producing data sets using Compact Disclosure CD-ROMs. For instance, Helwege, Pirinsky, and Stulz (2007) use October CD-ROMs, although they do not provide a specific reason for the choice of October. My choice of June comes from the fact that the latest available CD-ROM is of July 2006; however some July CD-ROMS are missing. For consistency, I use June CD-ROMS of each year. This also enables me to extract all available information that belongs to the calendar year 2005. I performed a manual check to see whether supplementing the data set with information from December CD-ROMs would improve the analysis, however it has appeared to have almost zero value added.

whereas otherwise would have been classified as non-interlocking.[11] However, due to the fact that Riskmetrics provides data starting from 1996, I set my M&A sample period beginning as January 1, 1996.[12] This results in a sample period of ten years (1996-2005) that includes booms and bottoms in merger activity.

Creating a data set of directors out of these two different sources is not trivial. Compact Disclosure is not a directors database in its nature, the information provided on directors is text information, which implies that the directors do not have IDs. Hence, I perform first an automated correction and later a manual check for assignment of a unique ID to each director. Riskmetrics database, on the other hand, is directors database, hence includes a unique ID for each director. However, to be able to merge its directors data with Compact Disclosure data, I repeat the ID assignment process for the combined data set. The basic identifiers in my analysis are name, age and title for the directors; and CUSIP and ticker for the companies.

The directors data set I create covers 23,010 distinct firms, 302,808 distinct individuals, and spans the period from 1994 to 2005. I merge the M&A sample with this data set. A total of 2,349 deals, which is 85.3% of the whole sample, have information on both the target and the acquirer directors in the year prior to the deal announcement. To be more precise, I use a 450 days window prior to the announcement date to identify the directors from the company filing information provided by Compact Disclosure.[13] The choice of the window comes from Fahlenbrach, Low, and Stulz (2010) who define adjacent proxies as to have a maximum of 450 days in between. This choice is also appropriate for Riskmetrics data set as annual meetings almost always take place in the same month of each year.

I control for several target characteristics that may affect target selection. For this reason, I exclude the deals where one or more of the target financial controls in the fiscal year prior to the announcement date are not available from Compustat annual files. Finally, I consider only the deals where the target lagged six months return and volatility data prior to the announcement date is available from CRSP daily files as these are included in my control variables.

[11] Ferris, Jagannathan, and Pritchard (2003) find that the boards with directors serving on three or more boards are heavily skewed toward the largest companies in their sample, and that such directors hold approximately half of their directorships in Forbes 500 companies. Given this, it is especially important to supplement Compact Disclosure data with Riskmetrics data as directors missing in Compact Disclosure database are more likely to belong to S&P 1500 companies.

[12] Actually, I need one year of prior data to determine the interlocking directors. However, given that Riskmetrics database provides 84% of 1996 directors data during the first half of the year, I opt to include 1996 M&A data in my study. I supplement the directors data set with Compact Disclosure's 1994-1995 data.

[13] This is the precise reason for the inclusion of director data that pertains to year 1994. However, note that only last three months of 1994 data will be relevant.

My final M&A sample consists of 2,088 deals, with an average value per transaction at $1,911 million. Table 2 presents the distribution of my M&A sample by the announcement year, and with respect to the presence of interlocking directors. Consistent with the literature, the merger activity in my sample drops from its peak in 1999 until 2003, where it bounds back and then decreases again gradually in 2005. I label a deal as *interlocking* if there exists at least one director common to both the target and the acquirer firm at the time of the deal announcement, and I label such directors as *interlocking directors*. A deal where there is no interlocking director is labeled as *non-interlocking*. Out of 2,088 deals, 76 (3.6%) are interlocking and 2,012 are non-interlocking. In terms of transaction values, interlocking deals represent $184,050 million (4.6%) of the overall transaction volume from 1996 to 2005.

[Insert Table 2: M&A Sample by Announcement Year and Deal Type]

Table 3 presents the industry distribution of the target and the acquirer based on the United States Department of Labor's Standard Industrial Classification (SIC) code divisions.[14] Manufacturing (30.5% of targets and 32.3% of acquirers), Services (23.1% of targets and 28.5% of acquirers) and Finance (27.1% of targets and 19.7% of acquirers) are the most active industries in the M&A sample in terms of the number of acquisitions. These are followed by Transportation & Public Utilities, Wholesale & Retail Trade, and Mining industries.[15] As can be seen in the final column and row of the table, interlocking deals do not concentrate strongly by industry and their industry distribution exhibits a pattern similar to the M&A sample.

[Insert Table 3: M&A Sample by Industry Distribution of the Target and the Acquirer]

Before moving to the next section to analyze the deal characteristics, I should clarify the specification of "interlocking deals". My aim is to identify the deals where there is a strong channel of information transmission between the parties involved in M&A. As a result, I focus on the directors who are contemporaneously sitting at the boards of the target and the acquirer. However, there are few cases where the unique interlock is not a common board director; but a *director* at the target firm, and a top-level executive at the acquirer firm. Although these cases are not identical to board interlocks, they neither are clearly distinguishable on informational

[14]The SIC code division structure is available at the United States Department of Labor's website: http://www.osha.gov/pls/imis/sic_manual.html.

[15]The industry distribution of the targets in my sample is in line with those reported in the literature (Cai and Sevilir 2012; Kang and Kim 2008).

grounds. The reason is that top-level executives have superior knowledge on the firm and, most likely, influence board decisions to a great extent. Consequently, I decide to specify such deals as "interlocking deals". Nevertheless, out of 76 deals, only 6 are as such; specifying these deals as "non-interlocking" does not alter the results.

3.2 Descriptive Statistics

In this section, I analyze the deal, target and bidder characteristics in the whole sample, and separately in interlocking and non-interlocking sub-samples. I start by reporting the descriptive statistics for the whole M&A sample in Table 4. Even though my sample is slightly different, the main variables are in line with those reported in the literature (Andrade, Mitchell, and Stafford 2001; Bodnaruk, Massa, and Simonov 2009; Cai and Sevilir 2012). The percentage of interlocking deals in my sample is 3.6%, as opposed to 3.9% in Cai and Sevilir (2012) sample.[16] The rate of deal success is 88% in my sample whereas it is 76% for Bodnaruk et al. (2009). 16% of bids in my sample are tender offers compared with 14% in Cai and Sevilir (2012). The fraction of all cash deals and deals in the same industry are 29.0% and 57.3% in my sample, while they are 33.2% and 60.8% for Bodnaruk et al. (2009), and 35.4% and 42.1% for Andrade et al. (2001). 7% of deals in my sample are hostile, compared with 8% in Bodnaruk et al. (2009) and Andrade et al. (2001), and 1% in Cai and Sevilir (2012). Toeholds are present in 3% of the deals in my sample, while being present in 10% of the deals in Bodnaruk et al. (2009).[17] The average target (bidder) has a market capitalization of $1,269 million ($13,356 million), as opposed to $1,013 million ($10,433 million) in Bodnaruk et al. (2009).

[Insert Table 4: Descriptive Statistics for the M&A Sample]

Next, I compare the deal characteristics in interlocking and non-interlocking deals. As can be seen in Table 5, the deal characteristics are not substantially different among the sub-samples. Interlocking deals are slightly larger deals, while being more friendly: hostile deals, poison pills and proxy fights are not common among interlocking deals. Total fees and fees paid by the

[16] Cai and Sevilir (2012) use a sample of *completed* M&As among public firms with the announcement date and effective date between 1996 and 2008. In their sample, the acquirer controls less than 50% of the target before the acquisition announcement and owns 100% of the target after the transaction whereas in my sample both of these threshold percentages are 50%. Cai and Sevilir (2012) find that among 1,664 deals, 65 have an "interlocking director" (a "first-degree connection", as they name it).

[17] Consistent with Bodnaruk et al. (2009), I define toehold as a minimum of 5% ownership of the bidder in target's common stock as of the deal announcement.

acquirer and target are larger in monetary terms, perhaps due to larger transaction values; but smaller in percentage terms. Also, interlocking deals are more likely to lead to post-bid competition. However, these differences are not statistically significant. The only significant difference among interlocking and non-interlocking deals is that toeholds mostly pertain to interlocking deals. This issue will be analyzed in detail in Section 7.2, where I show that results are robust to excluding the deals with toeholds from the sample.

[Insert Table 5: Descriptive Statistics for Interlocking and Non-Interlocking Deals]

At this point, an analysis of the firm characteristics in interlocking versus non-interlocking deals is in order. Basically, we would like to see if the targets significantly differ in some characteristics other than the interlocking relationship. If there are significant differences among these groups, then we would suspect that some aspects other than the information transmission through the interlocking directors are behind the results of this paper. Table 6 reports the characteristics of interlocking targets and non-interlocking targets. The tests of differences reveal that these targets are not significantly different from each other in terms of financials, except that the interlocking targets are slightly larger in size and have smaller six months lagged returns.

[Insert Table 6: Descriptive Statistics for Interlocking and Non-Interlocking Targets]

In addition to target financials, Table 6 demonstrates board and corporate governance characteristics for interlocking and non-interlocking targets. Despite having similar board size, interlocking targets are more central in board networks than non-interlocking targets; with board centrality being proxied by variables commonly used in the literature: degree centrality, average directorship count and interlock count. This leads to a classification of 21% of the interlocking target boards as "busy boards", as opposed to 13% of the non-interlocking target boards. Interlocking targets also have lower governance and entrenchment indices; only 26% of the interlocking targets are "highly-entrenched", compared with 46% of the non-interlocking targets. Even though these differences are significant, in Section 7, I will demonstrate that the data does not support alternative explanations arising from network centrality or entrenchment literature.

Table 7 reports the acquirer characteristics for the sub-samples of interlocking and non-interlocking deals. Acquirers have significantly higher size and price to earnings ratios in interlocking deals, at the expense of smaller liquidity ratios. The tests of difference do not reveal any other significant differences.

[Insert Table 7: Descriptive Statistics for Interlocking and Non-Interlocking Acquirers]

4 Interlocking Directors and the Probability of Becoming a Target

In this section, I examine whether having an interlocking director with the acquirer increases the probability of being selected among potential targets. In order to test this, first, I have to define a set of potential targets for each deal. Following Bodnaruk et al. (2009), I start with the set of the firms that belong to the two-digit SIC code industry of the actual target and have similar size (within 30% band of the market capitalization of the actual target). I consider this set as my *basic sample*. I estimate a probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise.

Among the control variables are firm's return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership and industry Herfindahl index.[18] Following the literature on geographic proximity, I also include a dummy variable in the regressions which takes value 1 if the target is in the same state as the acquirer, and 0 otherwise (Kang and Kim 2008).[19] I use either year and industry (two-digit SIC code) dummies, or deal dummies in the regressions. With the exception of dummies and indices, I winsorize all control variables at the bottom and top 1% to limit the effect of outliers.

The initial two columns of Table 8 reports the results of this probit regression. As can be seen, the interlocking dummy has a positive coefficient that is statistically significant at 1% level. This indicates that the main prediction of my model is empirically strongly supported: Interlocking firms are more likely to be selected as acquisition targets than non-interlocking firms. Moreover, the effect is economically substantial. Having an interlocking director with the acquirer raises the likelihood of becoming a target by 12.18% when industry and year effects are controlled for.

[Insert Table 8: Interlocking Directors and the Probability of Becoming a Target]

[18] Institutional ownership is the fraction of target's stock owned by institutional investors required to report 13F filings. The data is obtained from Thomson 13-F master files. The variables are defined in Appendix 2.

[19] Using a sample of partial block acquisitions, Kang and Kim (2008) show that acquirers have a strong preference for geographically proximate targets. Similarly, Almazan, de Motta, Titman, and Uysal (2010) find that firms located within industry clusters make more acquisitions.

As potential target is somewhat of a nebulous concept, I test my hypothesis for various specifications of the set of potential targets. As in Bodnaruk et al. (2009), the first alternative I consider is changing the definition of industry to three-digit SIC code, while keeping the characteristic constant (30% band of market capitalization). Columns 3 and 4 of Table 8 reports the probit regression results for this sample. Notice that the results are very similar; there is only a small reduction in the coefficient value of the interlocking dummy. This is, perhaps, mostly due to a significant loss of observations since for this constrained set of three-digit SIC code industry, there are no other (nonselected) potential targets for some selected targets; eventually these are excluded from the regression.[20]

In the other alternative specifications, I keep the industry definition as two-digit SIC code, but I change the target financial used to define similarity. Following Bodnaruk et al. (2009), I alternatively use a 10% band of book to market ratio to define similarity.[21] Columns 5 and 6 of Table 8 report the regression results for this sample. As a final alternative, I use a 10% band of debt to equity ratio, and report the results in columns 7 and 8 of Table 8. As can be seen in the table, the effect of interlocking directors is robust across various industry classifications and firm characteristics that are used to define the set of potential targets.

Throughout the study, I will analyze the results for all four specifications of the set of potential targets. Nevertheless, there are reasons to believe that *the most relevant specification is two-digit SIC code industry and 30% size band.* First, in 14% of the deals (287 deals from a total of 2,088), the target and the acquirer belong to the same two-digit SIC code, but not to the same three-digit SIC code industry. This means that one in every seven deals, two-digit rather than three-digit SIC code industry is decisive. Second, target size is one of the most decisive characteristics in target choice as it directly determines the amount of money the acquirer has to pay for target shares to complete the acquisition.[22] Finally, other studies base their results on potential targets defined using these characteristics (Bodnaruk et al. 2009; Bouwman 2011; Hasbrouck 1985; Shivdasani 1993).

The ultimate lesson from the analysis in this section is that interlocking firms have higher

[20] Due to the exclusion of the deals with only one potential (and selected) target, in the sample defined as three-digit SIC code and 30% band of market capitalization, only 59 deals are interlocking out of a total of 1806 deals.

[21] Actually, Bodnaruk et al. (2009) mention a 15% band of book to market ratio as an alternative. I choose 10% band as this results in a sample that is closer to the basic sample with respect to the number of potential targets. Results are very similar if I use a band of 15% instead of 10%.

[22] Hasbrouck (1985) notes that "with credit rationing, potential bidders may face limitations on the absolute size of their outlay, and hence limitations on the size of the firm they may reasonably expect to acquire".

probability of being selected among potential targets, with the effect being statistically significant at 1% level. This result is robust to various specifications of the potential set, which indicates that interlocking directors' effect is very strong. In the next Section, I relate this phenomenon to the target-side information asymmetry.

4.1 Targets with High Information Asymmetry

The idea that interlocking directors help overcome the information asymmetry problems by facilitating informational flows is a central feature of my model. Therefore, I expect to see stronger results after interacting the interlocking dummy with firm specific variables that proxy for the extent of information asymmetry in the target environment.

I rely on the prior literature to construct proxies for the information asymmetry level for a given firm.[23] The first variable I consider is a performance measure of the target firm, namely return on equity. Literature suggests that firms with good news are more likely to be publicly forthcoming with the news whereas firms with bad news are less likely to be so (Miller 2002; Verrechia 1983). Consequently, firms that are performing poorly would have higher information asymmetries as these firms would not be willing to reveal information. Hong, Lim, and Stein (2000) also note that "firm-specific information, especially negative information, diffuses only gradually across the investing public". Hence, we would expect a negative coefficient on the interaction term between the interlocking dummy and the performance of the target firm. As can be seen in Panel A of Table 9, conditioning on similar size, the interaction term has a negative coefficient, significant at the 5% (10%) level for the regression with deal (industry and year) controls. The results for the set of targets similar in debt ratio are even stronger, with significance at 1% level. In sum, coefficients for all specifications have the negative sign as expected, and except one (which has a p-value very close to 10%), are statistically significant. This is consistent with the idea that selection of the interlocking targets is driven by information asymmetry regarding target value, with asymmetry being proxied by poor performance. Notice that in order to be consistent with my control variables, I use return on equity as the performance measure. Results are even stronger if, as in Kang and Kim (2008), I use return on assets rather than return on equity as my proxy.

[Insert Table 9: Interlocking Directors and Targets with High Information Asymmetry]

[23] My proxy selection closely follows Kang and Kim (2008).

The second proxy I consider for the information asymmetry is the target size. Literature claims that small firms are subject to information asymmetry problems to a bigger extent than large firms are, due to the fact that information about small firms gets out more slowly than that about large firms. This is explained by investors' willingness to spend more resources on obtaining information regarding firms in which they can take large positions (Hong et al. 2000). Following Kang and Kim (2008), I include a dummy variable that takes value of 1 if the target size is in the bottom 25% of the sample, and 0 otherwise; and its interaction with the interlocking dummy in the regressions. As reported in Panel B of Table 9, the coefficient on the interaction term is positive and significant at the 5% (10%) level when I control for the deal (industry and year) effects. Hence, in our basic sample, interlocking targets are more likely to be selected than non-interlocking targets, particularly when they are small. The effect is not clear for other specifications of the potential target set, as there is too much dispersion in the size of the potential targets.

Next variable I consider as a proxy for information asymmetry is the standard deviation of past stock returns. Kang and Kim (2008) note that the higher the standard deviation, the greater the uncertainty about the target's prospects, and this leads to greater information asymmetry. They use standard deviation of the target monthly returns over the past five years prior to the deal announcement to control for the riskiness of the target. However, out of 76 selected interlocking targets, 35 are missing standard deviation for the prior five years. In order to have meaningful regressions, I adjust the definition of the proxy as the standard deviation of the monthly returns for two years prior to the deal announcement. We would expect to find a positive coefficient for the interaction term between standard deviation and interlocking dummy. Panel C of Table 9 shows that the interaction term is significantly positive at the 5% (10%) level when deal effects are controlled for, conditioning on firms with similar size and two-digit (three-digit) SIC code industry. Similar to the small size proxy, for other specifications, I cannot find significant coefficients perhaps due to the fact that most of the interlocking firms have this variable missing.

So far, I have focused on the information asymmetry in the target environment, which does not depend on the identity of the acquirer firm. However, what I am trying to capture is the information asymmetry between the target and the acquirer; hence, some characteristics of the acquirer may be relevant. The industries where the target and the acquirer operates are of special importance, as knowledge spill-overs are assumed to be present within industry groups. This argument suggests that the benefits of information obtained through the interlocking director will be greater when other information enhancement mechanisms, such as belonging to

the same industry, are not available. I use the diversifying dummy, which is an indicator for the deals where the target and acquirer are from different two-digit SIC code industries, as a proxy for information asymmetry. Panel D of Table 9 illustrates that in all specifications, the interaction between diversifying dummy and interlocking dummy has a positive coefficient, as expected. The coefficient is statistically significant for five out of eight specifications, with the remaining three having p-values close to 10%. This is consistent with the idea that target-specific information is particularly important for diversifying deals where the acquirers are more likely to have informational disadvantages.

Overall, the results presented in this section are consistent with the hypothesis that interlocking directors help overcome the information asymmetry regarding the target value. The acquirers are more likely to select interlocking firms, particularly when they experience poor past performance, when they are small, when they are risky, or when they belong to a different industry. To the extent that these firms are those where target-specific information is more valuable, results indicate that interlocking directors have an important role in target selection.[24] In the next section, I relate the target selection phenomenon to the acquirer-side information asymmetry.

4.2 Acquirers with Financial Constraints

In this Section, I analyze whether financially constrained acquirers are more likely to select interlocking firms. The intuition behind is as follows. Debt reduces the ability to raise funds for acquisitions (Almazan et al. 2010). Acquirers with high debt ratios might be obliged to use their stock in transactions. In an effort to avoid undervaluation costs, these acquirers would be biased towards selecting interlocking firms so to be able to exploit their advantage in transmitting information on their value to the target. Therefore, I expect to see a stronger effect of the interlocking directors in target selection when the acquirer is financially constrained due to a high leverage ratio. On the contrary, since the acquirers abundant in cash holdings or liquid assets are not likely to face problems in fund raising, I expect a weakened effect of the interlocking directors in these cases.

Following the finance literature, I start by defining financially constrained firms as firms

[24] Kang and Kim (2008) also use research and development (R&D) expenses of the target firm as a proxy. This variable would correspond to higher uncertainty regarding the target, hence higher information asymmetry. However, due to the fact that many actual targets are missing this variable, I cannot find any significant coefficient in its analysis. Out of 76 selected interlocking targets, 32 targets have missing values of R&D expenses.

with high leverage. Specifically, I use the control variable in my study, debt to equity ratio, to proxy for firm's financial leverage. I include the interaction of this variable with the interlocking dummy in the regressions. Panel A of Table 10 demonstrates that the interaction term is positive in all specifications, and significant up to 1% level, except for the set of potential firms with same three-digit SIC code industry and similar size. Results indicate that acquirers are more likely to select interlocking firms, especially when they have high debt ratio. I obtain similar results when I use net market leverage defined in Almazan et al. (2010) instead of debt to equity ratio to proxy for financial constraints of the acquiring firm.

[Insert Table 10: Interlocking Directors and Acquirers with Financial Constraints]

Next, I analyze the effect of interlocking directors when acquirers have higher financial slack in terms of unused liquidity. Specifically, I interact the interlocking dummy with cash over net total assets as defined in Almazan et al. (2010). Panel B in Table 10 illustrates that, as expected, the interaction term has a negative coefficient which is economically and statistically significant at 1% across all specifications. Using accounting liquidity variable from the study of Bodnaruk et al. (2009) rather than cash holdings provides very similar results. These are reported in Panel C of Table 10. The results reveal that acquirers which are constrained in liquidity display further bias towards selecting the interlocking firms.

Overall, the results presented in this section are consistent with the hypothesis that interlocking directors help overcome the information asymmetry regarding the acquirer value. The acquirers, particularly when they have high financial leverage, or when they are constrained in cash holdings or in liquidity, are more likely to select the interlocking firms. To the extent that these acquirers are those for whom it is more valuable to transmit acquirer-specific information to the targets, results indicate that interlocking directors play a significant role in target selection.

5 Interlocking Directors and Deal Structure

In this section, I analyze further the characteristics of interlocking deals. First, I show that interlocking deals economically benefit the acquirers, in the sense that they pay lower premiums for the target shares. Table 11 demonstrates this fact. Following the literature, first I define premium as the acquisition price, obtained from SDC, divided by the target price on 4 weeks prior to the announcement date. Panel A of table 11 shows that the mean (median)

premium in interlocking deals is 37% (36%) as compared to 45% (57%) in non-interlocking deals. Nevertheless, the difference is not statistically significant. Next, I perform a regression analysis where, among the regressors, I include the variables that the literature has classified as the determinants of the premium paid by the acquirer. Panel B of table 11 reveals that interlocking dummy has a negative coefficient, however, it is significant only at the 13% level when both year and industry dummies are included.

[Insert Table 11: Interlocking Directors' Effect on the Premium Paid for Target Shares]

An alternative measure of premium is proposed in a recent work by Malcolm, Pan, and Wurgler (2009). This paper argues that the target's 52-week high price represents a reference point to investors and managers, and displays a strong effect on the determination of the acquisition price. The paper finds that acquisition prices are often biased towards this reference price. Following Malcolm et al. (2009), I define "high price" as the 52-week high stock price of the target firm over 52 weeks ending 4 weeks prior to the announcement date. As can be seen in Table 11, the premium calculated as the ratio of the acquisition price to "high price" is significantly lower in interlocking deals than in non-interlocking deals. I obtain similar results when I use a high price dummy to indicate the deals where acquisition price is higher than "high price", and use this as the dependent variable. Overall, the results suggest that interlocking deals are profitable for acquirers since they pay significantly lower premiums for target shares in these deals.

Next, I analyze interlocking directors' effect on other relevant deal characteristics. Table 12 demonstrates that all stock payment is more likely in interlocking deals, with the effect being statistically significant. This is consistent with the hypothesis that interlocking directors help resolve information asymmetry problem regarding the acquirer value. Interlocking deals are also more likely to provoke competition, even though the effect is not significant. Finally, I find that the deal is less likely to be completed if there is an interlocking director, with the effect being insignificant.

[Insert Table 12: Interlocking Directors' Effect on All Stock Payment, Post-Bid Competition, and Deal Success]

Note that as interlocking deals are profitable deals for the acquirers, when an interlocking target is available, the choice of a non-interlocking target is highly suspicious. I analyze this issue in the next section.

6 Performance of Non-Selected Interlocking Firms

My model states that if the bidder privately receives a low signal on the valuation of the target, she will find it more profitable to make an offer to the unacquainted firm, as long as the synergy value is above some threshold level. This would correspond to a case where the actual target is a non-interlocking target, and is selected despite the fact that there is a very similar target interlocking with the acquirer. Hence, the model suggests that such non-selected interlocking targets are prone to bad performance. In this section, I test this hypothesis. Specifically, I analyze the accounting and stock market performance of the non-selected interlocking firms and provide evidence on their under-performance.

6.1 Accounting Performance

To analyze the post-announcement performance of the non-selected interlocking targets, I only consider the deals where a non-interlocking firm is selected as target whereas some interlocking potential target firms exist along with other non-interlocking potential targets. The interlocking dummy is defined as before, but in this specific sample. I follow Fahlenbrach et al. (2010) to perform a proper comparison of the performance of non-selected interlocking firms with that of their peers. I define change in performance of the firms as return on assets (ROA) averaged over the three years following the deal announcement divided by its average over the three years prior to the deal announcement. Table 13 demonstrates that mean and median change in performance of non-selected interlocking firms are negative across all specifications, with median (mean) being significantly different from zero in all (most) of them. Next, I define a control firm for each non-selected potential interlocking firm as another potential target firm in the same deal that is non-selected but non-interlocking, and that has the closest value of prior three year ROA to that of the non-selected interlocking firm. I adjust the change in performance of the non-selected interlocking firm by subtracting that of the control firm. As can be seen in Table 13, in the basic sample, the non-selected interlocking firms have an average (median) of -40% (-16%) change in return on assets when change is adjusted using the peer firms, with significance at 10% (1%) level. The results are similar across the specifications, however the number of firms and significance of coefficients is not as high. This provides evidence on the idea that negative information regarding these interlocking firms must be the reason why they were not selected as targets.

[Insert Table 13: Accounting Performance of Non-Selected Interlocking Firms with Respect to Their Peers]

6.2 Stock Market Performance

According to my model, the reason why an interlocking firm is not selected as the target is that the acquirer has received negative information on this potential target firm. If we expect the bad news on a firm to come out through time, we would be able to observe this as a deterioration in the stock market performance of the firm. As the bad news come out, the market would process the information and the stock price of the company would adjust. Therefore, we would expect a reduction in the stock price of such firms. In this section, I analyze whether the non-selected interlocking firms under-perform their peers in the stock market.

Following Bodnaruk et al. (2009), I create portfolios of the potential targets and analyze their performance. As in the previous section, I only consider the deals where a non-interlocking firm is selected as target whereas some interlocking and non-interlocking potential target firms exist. I refer to such deals as "relevant deals", and analyze three different portfolios of potential target firms in these deals. As there will be an in-depth analysis, I consider only the basic sample where potential target firms are defined as firms that belong to the two-digit SIC code industry of the actual target and have similar size. I focus on the equal weighted returns in an attempt to reduce the noise inherent in defining potential targets.

The first portfolio I consider is the portfolio of interlocking firms that are not selected in relevant deals, which I name as the "interlocking portfolio". The second portfolio consists of all potential target firms in these deals that do not have an interlocking director with the acquirer, which I name as the "non-interlocking portfolio". The third portfolio is a sub-set of non-interlocking portfolio where, for each firm in the interlocking portfolio, a control firm that belongs to the same deal and has the closest lagged return value is selected from the non-interlocking portfolio. I name this portfolio as the "control portfolio". By construction, the number of firms added to the interlocking and control portfolios are same at each point in time, but the size of the portfolios may vary slightly as firms get delisted. Finally, for a comparison, I also consider CRSP equal weighted portfolio.

The details of the portfolio formation is as follows. Whenever a relevant deal is announced, the interlocking and non-interlocking potential target firms are added to the corresponding portfolios. Specifically, the firms are added to the portfolios on the day after the deal announcement

and are held in the portfolio for 1 year (252 trading days). This is a dynamic portfolio where firms enter and exit at non-regular dates. Therefore, the number of firms in the portfolio varies with time depending on the announcement of relevant deals and the number of potential targets. As relevant deals occur often, the portfolios are non-empty from the creation date until the closing date. However, as the first relevant deal is announced on January 23, 1996 and the last on December 5, 2005, for few days in January and December, there are no firms in the portfolios. For these days, I assign the market portfolio returns to the portfolios. This results in a portfolio for the full period of January 1996-December 2006. I also consider 2 years and 3 years holding period portfolios which are for the periods of January 1996-December 2007 and January 1996-December 2008, respectively. Finally, I analyze the monthly return series that are obtained by compounding the daily returns of portfolios.

Figure 1 presents the cumulative returns of the equal weighted interlocking and non-interlocking portfolios for holding periods of one, two and three years. Note that all three portfolios outperform the CRSP equal weighted portfolio. In order to capture the risk, I regress each portfolio's returns (excess of risk free rate) on four factors: market, size, and book to market factors proposed by Fama and French (1993), and Carhart (1997) momentum factor.[25] In un-tabulated results, I find that these portfolios have significant positive alphas. This is not surprising since the literature has already shed light on significant positive returns to the potential target firms.

[Insert Figure 1: Cumulative Returns of the Equal Weighted Interlocking and Non-Interlocking Portfolios]

Song and Walkling (2000) demonstrate the increase in firms' stock prices following the acquisition of their rivals and attribute this to the increased expectation that they will be taken over themselves, which is named as "acquisition probability hypothesis". Similarly, Cremers et al. (2009) show that anticipated takeovers affect the correlation of a stock's return with the market return. They construct a quintile-spread portfolio that buys firms with a high takeover vulnerability and sells firms with a low takeover vulnerability, and this portfolio has an annualized abnormal returns of 11.77% when four factors are controlled for. Finally, Edmans, Goldstein, and Jiang (2012) create a novel instrument to addresses the fact that prices are endogenous and increase in anticipation of a takeover, which they name the "anticipation effect".

[25] I thank Kenneth French for providing the Fama and French (1993) factors on his website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/. I calculate the momentum returns using the procedures of Carhart (1997).

Eckbo (1992) demonstrates that a significant portion of the rival firms across individual U.S. mergers earn non-zero abnormal performance as a result of the merger announcements. Despite their non-significant negative returns in non-horizontal deals, rivals in horizontal deals earn cumulative abnormal returns of a significant 1.26% within [-20,10] window of the announcement date. The abnormal returns are higher for the sample of U.S. horizontal challenged deals and when using the rival firms identified by the enforcement agencies. This effect is consistent with two scenarios: the market power hypothesis where the dominant coalition reduces industry output and increases the product price post-merger; and information signalling hypothesis where the merger signals opportunities for efficiency gains available to the non-merging industry rivals as well. However, consistent with the prior literature (Eckbo 1983, 1985; Schumann 1990), Eckbo (1992) finds evidence in favor of the information signalling hypothesis.

One could argue that interlocking and non-interlocking portfolio returns may be driven by the abnormal returns to the potential target (rival) firms. To assess the magnitude of the effect of acquisition announcements, I analyze the abnormal returns to non-selected potential target firms in relevant deals using standard event study methodology. Following Kang and Kim (2008), I first obtain the estimates of the market model for each firm by using 200 trading days of return data, beginning 220 days before and ending 21 days before the deal announcement. I use as the market return the CRSP equal weighted return, and sum the daily abnormal returns to get the cumulative abnormal return (CAR) from day t_1 before the announcement date to day t_2 after the announcement date. Table 14 reports the CARs for non-selected potential targets for different event windows [t_1,t_2]. For short event window of [-20,1], the cumulative returns are on average positive, however, for other windows they are negative.[26] What can be clearly seen from the table is that non-selected interlocking firms have lower cumulative abnormal returns than the non-selected non-interlocking firms. However, the differences are not significant.

[Insert Table 14: Cumulative Abnormal Returns for Non-Selected Interlocking and Non-Interlocking Firms]

Next, I create portfolios starting from the second day after the deal announcement to clean out the large first day abnormal returns that may accrue to potential target firms. The reason is that I want to assess the long term stock market performance of firms following the deal announcements. The resulting portfolios are presented in Figure 2. As can be seen in the figure, now the cumulative returns of interlocking portfolios worsen compared to the non-interlocking

[26] Note that unlike Eckbo (1992), I do not distinguish between horizontal or non-horizontal deals.

portfolios. The difference is mostly reflected in one year holding period portfolios; two and three years holding period portfolios perform similar to those in Figure 1. For one year holding period, all three portfolios have similar performance that is superior to the CRSP market portfolio. However, as we increase the holding period, the interlocking portfolio starts to distinguish itself. Indeed, the three year holding period interlocking portfolio does not outperform CRSP portfolio, neither does two year holding period interlocking portfolio.

[Insert Figure 2: Cumulative Returns of the Equal Weighted Interlocking and Non-Interlocking Portfolios - Starting from the Two Days after the Deal Announcement]

Finally, I regress each portfolio's excess returns on three Fama and French (1993) factors and Carhart (1997) momentum factor. The results of the regressions are presented in Table 15. As can be seen from the table, the portfolios have significant alphas, both economically and statistically. Note that the alphas I obtain from the portfolios of potential target firms is consistent with what Cremers et al. (2009) obtain from the quintile-spread portfolio (an annualized 14-19% vs. 12%). However, whereas Cremers et al. (2009) determine firms from probit regressions run each year using all available firms, I focus on the firms that are similar to the actual targets during portfolio formation.

[Insert Table 15: Regression Results for Portfolios of Non-Selected Interlocking and Non-Interlocking Firms]

Let us analyze the alphas of portfolios with different holding periods. One year holding period portfolios of potential target firms have significantly positive alphas, even when the first day abnormal returns are not considered. However, alpha of the interlocking portfolio is lower than that of the non-interlocking or control portfolio. What is more interesting is that, non-interlocking portfolio and control portfolio continue delivering significant alphas for two and three year holding periods whereas interlocking portfolio does not deliver alphas for long horizons. Figure 3 demonstrates in detail how the interlocking portfolio under-performs the non-interlocking portfolios and the CRSP equal weighted portfolio when the holding period is three years.

[Insert Figure 3: Cumulative Returns of the Equal Weighted Portfolios with Three Years Holding Period - Starting from the Two Days after the Deal Announcement]

The findings in this section point to that *non-selected interlocking firms* under-perform *non-selected non-interlocking firms* in the stock market, specifically when we consider portfolios of two or three years holding periods. This is consistent with the idea that bad news on the non-selected interlocking firms might have been the reason for the acquirer to select a non-interlocking firm in these deals. This is also consistent with alternative stories. For instance, it could be the case that non-selected interlocking firms do not have fundamental problems which would be considered as bad news, but simply that there are obstacles in acquiring them.[27] This would also result in under-performance of the interlocking portfolio given the acquisition probability hypothesis. However, even if this is the explanation behind the interlocking firms' returns, observing that the acquirers have not selected them in the first place provides evidence on that information flows from interlocking directors might have benefitted the acquirer in target selection.

7 Robustness Analysis

In this section, I analyze whether the results are driven by the endogeneity issues, sample selection or some alternative mechanisms. Basically, I analyze the possibility of reverse causality or omitted variables, the acquirer's ownership in the target prior to the deal, board centrality of the interlocking targets, and the entrenchment literature, as alternative explanations.

7.1 Testing the Endogeneity Concerns

The results in this paper support the model's first prediction: Having an interlocking director with the acquirer raises the likelihood of becoming a target, specifically when the potential problems that would arise from information asymmetry between the target and the acquirer are more relevant. This finding rejects the null hypothesis that target selection is independent of interlocking directors and, to the extent that appointment of interlocking directors are exogenous, supports the hypothesis that information flows through an interlocking director may induce a firm to become an acquisition target.

A potential concern is that creation of director interlocks may be endogenously determined. One concern is the reverse causality. It may be the case that an acquirer that is interested in a specific target first initiates a board relationship with that target. To analyze this possibility, I

[27] It would be interesting to further analyze the characteristics of the firms in the interlocking portfolio, especially regarding the entrenchment issues.

manually collect information on the tenure of the interlocking directors from proxy statements available at SEC EDGAR database. I find that the mean (median) number of years that an interlocking directors spends on target firm before deal announcement is 6.4 (5) years and that on acquirer firm is 11.3 (9) years. If we consider the initial year of the interlocking relationship, i.e. the minimum of tenure at the target and that at the acquirer, the mean (median) is 4.9 (3) years.[28] To the extent that M&A transactions are not planned 3-4 years before the deal announcement, this finding suggests that reverse causality is not a plausible explanation for how interlocking directors relate to target selection.

A second concern is the role of the unobservables in target selection. An alternative explanation of the interlocking director effect is that interlocking firms have fundamentally different unobservable characteristics, and that these characteristics are related to the tendency of firms to pair in M&As. In other words, interlocking directors may be endogeneously determined. Literature provides theoretical background (Adams and Ferreira 2007; Harris and Raviv 2008; Hermalin and Weisbach 1998) and empirical evidence (Coles, Daniel, and Naveen 2008; Linck, Netter, and Yang 2008) on that the board of directors are endogeneously determined according to the firm's corporate governance needs. Interlocking directors may be a result of this endogeneity.

A possible explanation for interlocking directors' effect on target selection is as follows. It could be the case that firms with greater similarity are more likely to select the same directors for their boards, resulting in the interlocking relationship. If the acquirers also tend to select targets with characteristics similar to theirs, observing an interlocking director between the M&A parties may be an artifact of acquirer-target similarity. Put in other words, omitted characteristics that relate to firm similarity may determine target selection and this may reveal itself in interlocking directors; suggesting that their information transmitter role is irrelevant for target choice. However, the approach taken in this study alleviates these concerns to a great extent. Note that in the regression analysis, for each deal, first I create a set of firms *similar* to the actual target (set of potential target firms), and then test target selection in this sample. If some specific characteristics of the actual target determine firm similarity that leads to an acquisition, we would expect these characteristics to be present also in the potential targets. As long as such characteristics are controlled for in the definition of the set of potential targets, endogeneity should not be a concern.

Recall from Table 8 that the effect of the interlocking directors is economically and statis-

[28] These numbers are consistent with Cai and Sevilir (2012) who state that a typical interlocking director spends on average 6.4 years on both the acquirer's and the target's board before the deal announcement.

tically very strong in all specifications where I control for industry, size, book to market and leverage of the firms by defining the potential target sets accordingly. Note that these characteristics overlap with the ones proposed in the literature as the determinants of becoming a takeover target (Cremers et al. 2009). To the extent that acquirer-target similarity is revealed in these variables, endogeneity should have been accounted for. In this section, I analyze further firm characteristics that may determine firm similarity. One potential omitted variable is the corporate governance of firms. The literature has found a set of variables that help explain firm corporate governance and I consider these as alternative characteristics to control for firm similarity (Coles et al. 2008; Linck et al. 2008). These are board characteristics, therefore any omitted variable resulting in the interlocking directors are expected to be present in these characteristics as well. To be more specific, in determining the potential targets, along with the two-digit SIC code industry, I use a 10% band of board size, or board independence (percentage of "outside directors" whose primary affiliations are with another firm), or degree centrality. Alternatively, I use a 10% band of ROA to control for the accounting performance of firms.

Results of this analysis is demonstrated in Table 16. The magnitude and significance of the positive effect of interlocking directors on target selection in these alternative specifications are very similar to those in Table 8. The controls introduced in this section do not diminish the effect of interlocking directors; the change is insignificant. These results suggest that interlocking directors are exogeneous to relevant firm characteristics up to a level such that controlling for them does not alter the results.

[Insert Table 16: Testing the Endogeneity Concerns: Alternative Sets of Potential Targets]

In a recent work, Bouwman (2011) finds that while firms attempt to select directors whose other directorships are at firms with similar governance practices, this matching of governance practices is imperfect because many other factors also affect the director choice. Moreover, directors acquainted with different practices at other firms influence the firm's governance to move toward the practices of those other firms. The result is the convergence of governance practices which is supportive of an effect running from interlocking directors to corporate governance changes.

A final piece of evidence on the extent of the exogeneity of the interlocking relationships comes from the previous literature. Koenig, Gogel, and Sonquist (1979) examine the reconstitution pattern (and its stability) of the interlocking relationships between the largest American firms which ended through the death of an outside director. They conclude that "interlocking

directorates do not generally represent evidence of *close interconnections* between specific *corporations* but do connect some stable, city-based groups". The low reconstitution rate that they found for interlock ties (6%) is later confirmed in a similar study of Palmer (1993) where he considers reconstruction of interlock ties that were accidentally broken due to events such as death or retirement (8.9%).

Another variable that might relate to target selection is acquirer's ownership of target shares prior to the deal announcement, i.e. toehold. Toeholds may be a concern for both reverse causality and omitted variables, and I investigate this in the next section.

7.2 Testing the Alternative Sample

In Section 3.2, we have seen that toeholds are frequently observed in interlocking deals (30%), as opposed to their rare occurrence in non-interlocking deals (2%). Interestingly enough, the causal relationship between the toehold and the interlocking director is not clear. It may be the case that the interlocking directors induce minority acquisitions in the linked firms, or that owning a toehold leads to the assignment of the interlocking directors to the target board. To be able to distinguish one from another, a deeper historical analysis for these cases is required.

Toeholds may indicate an interest of the bidder (minority shareholder) in acquiring the target firm. One would expect that if a bidder is interested in acquiring a firm, buying its shares prior to the bid would give an advantage to the bidder. Hence, including deals with toeholds in the sample may bias the results in favor of target selection. However, empirically, we do not observe this behavior. Betton, Eckbo, and Thorburn (2009) note that toehold bidding has declined dramatically since the 1980s and is now rare. They report that "only 3% acquire toeholds during the six-month period leading up to the initial offer announcement, the period when the actual bid strategy is being formulated" (Betton et al. 2009). Moreover, the annual toehold frequency has been steadily declining since 1980s. They name this phenomenon as the "toehold puzzle". Given these facts, it is not likely that a strong bias would be present in the results of this paper.

Let us consider back the causality issue. For the moment, assume that the acquirer of the minority share in target firm assigns its directors to the target board, hence causality is from toehold to the interlocking director. Given the "toehold puzzle", two alternative explanations are left for why the acquirer in the first place would initiate an ownership to later assign an interlocking director: benefit from some degree of control over target firm actions or benefit from

the inside information on the target firm.[29] The latter alternative is precisely what is analyzed in this paper. Therefore, I have opted to keep the deals with toeholds in my final sample.

Even though I have provided evidence on that including toeholds is an appropriate choice, to clear any suspicion on the results being driven by toehold considerations, I perform a very conservative robustness check. Specifically, I re-run each regression for a sample restricted to only deals without toeholds. This sample consists of 2,022 deals, of which, only 53 are interlocking. Given this low rate of interlocking deals (2.6%), it would not be surprising to observe a reduced significance of the coefficients. However, if we observe that overall significance of results diminishes substantially, even up to the point where the coefficient signs are altered, we might conclude that the results were driven by the deals with toeholds.

Table 17 reports the results of this robustness exercise. I find that basic sample results for the restricted sample (of deals without toeholds) are very similar to those for the unrestricted sample. As can be seen in column 1, the coefficient of interlocking dummy has only decreased to 0.838 from 1.102 even though 30% of the interlocking deals (toeholds) are excluded. The main hypothesis that interlocking firms are more likely to be selected as targets strongly holds in the restricted sample. The conclusions regarding target information asymmetry and acquirer financial constraints are neither contradicted. All coefficients of the interaction terms between the interlocking dummy and the proxies preserve their expected signs. The coefficients of interaction term with return on equity, standard deviation, and acquirer cash to assets ratio are still statistically significant. The coefficients of interaction term with small size, diversifying dummy, and acquirer debt to equity are not significant anymore, perhaps due to the loss in number of observations, but the p-values are slightly above 10% threshold. Only the interaction term with the acquirer liquidity has a coefficient with no significance, but one should note that many acquirer firms are missing this variable. Overall, this exercise demonstrates that results of the paper are not driven by toehold considerations.

[Insert Table 17: Testing the Alternative M&A Sample: Excluding Deals with Toeholds]

7.3 Testing the Alternative Explanations

In this Section, I test whether the empirical phenomenon of bidders selecting interlocking targets, which my information asymmetry model predicts, is driven by some other considerations.

[29] It is most likely that both benefits are considered by the acquirer.

The first alternative I consider is drawn from network centrality literature. A number of studies have shown that board networks affect strategic decisions such as the decision to acquire, the choice of target, and the method of payment. Stuart and Yim (2010) find that firms with central boards have a higher propensity to be targeted in private equity transactions. Similarly, Schonlaua and Singh (2009) show that central boards are more likely to make an acquisition and to be acquired. Bouwman and Xuan (2010) also find that a firm is more likely to engage in mergers and acquisitions, among other financial activities, if it has interlocks with firms that engage in the same activity.

In addition to its effect on strategic decisions, board centrality also relates to firm performance. Firms centrally positioned in the boardroom network may have better access to information, and this may lead to better performance, both around mergers and in normal times. Schonlaua and Singh (2009) find that firms with central boards of directors are associated with better performing acquisitions. Larcker, So, and Wang (2011) show that such firms earn superior risk-adjusted stock returns and future growth in return on assets. These studies indicate that board networks, created by multiple directorships, provide economic benefits. On the contrary, boards with multiple directorships may become ineffective monitors, which leads to weak corporate governance within the firm. Consistent with this consideration, Fich and Shivdasani (2006) find that firms with *busy boards*, those in which a majority of outside directors hold three or more directorships, are associated with weaker profitability and lower market to book ratios.

We have seen in Table 6 that interlocking targets are, in fact, significantly more central in the board network than non-interlocking targets, and more likely to have busy boards. Given the empirical findings in the literature and in this paper, it is possible that the interlocking targets are selected simply because their boards are more central, not because they have a direct link with the acquirer. The explanation could be as follows. Central firms are more likely to have busy directors, which perform their jobs ineffectively, and this results in under-performance of the firm (Fich and Shivdasani 2006). Firms with poor performance are more likely to be become hostile takeover targets, supporting the disciplinary role of corporate takeovers (Barber et al. 1995; Cremers et al. 2009; Hasbrouck 1985; Morck et al. 1988).[30] Due to their centrality, we are also more likely to observe an interlocking director in these firms; this leads to the target

[30]These studies have focused on the low market to book (q) ratios as a proxy for poor firm performance. The disciplinary role of corporate takeovers suggests that takeover targets represent cases where the corporation's internal controls and board level control mechanisms have been ineffective (Jensen 1996). Similarly, Shivdasani (1993) find that the outside directors of hostile targets have fewer incentives (as proxied by their lower equity ownership) to actively monitor managerial behavior, which is consistent with the view that board of directors and hostile takeovers are substitute mechanisms for corporate control.

selection phenomenon demonstrated in this paper. In order to rule out this explanation, I control for busy boards in the regressions.

Panel A of Table 18 report the regression results when, among the control variables, I include the busy board dummy, which takes value 1 if the majority of outside directors hold three or more directorships, and 0 otherwise. The coefficient of busy board dummy is not statistically significant in any of the specifications. In the basic sample with year and industry dummies, its coefficient is positive but not significant; and there is only a negligible reduction in the coefficient of the interlocking dummy, from 0.948 to 0.947. Overall, the results suggest that the economic and statistical significance of the interlocking relationship is robust to controlling for busy boards.

[Insert Table 18: Testing the Alternative Explanation: Network Centrality]

Next, I control for network centrality of the targets using the available proxies in the literature. The first measure I use is *degree centrality*, which measures a board's connectedness, and is defined as the number of interlocking outside boards. This measure is used in the studies of Stuart and Yim (2010) and Larcker et al. (2011). Following Schonlaua and Singh (2009), I normalize this variable by dividing it over the maximum degree centrality value of the corresponding year. The second measure I use is the *average directorship* of the target firm. The definition of this variable is obtained from Stuart and Yim (2010); it is the mean number of board seats held by the directors on each firm's board.[31] Finally, I include in my analysis the *interlock count*, which is the total number of interlocking directors with other firms as defined in Stuart and Yim (2010). Panels B, C and D of table 18 report the regression results when three proxies for network centrality are included, one at a time, as control variables. As can be seen, none of these variables significantly reduce the effect of the interlocking dummy. Clearly, the results in the paper are not driven by network centrality of the interlocking firms.

The second alternative I consider relates to the entrenchment literature. This literature has shown that cross-firm differences in corporate governance, specifically in anti-takeover defenses, have substantial effect on firm value and firm performance. Gompers et al. (2003) show that a governance index (the G-index) based on twenty-four provisions is negatively correlated with firm value. Bebchuk et al. (2009) demonstrates that six of these provisions fully drive their results and propose the entrenchment-index (the E-index) based on these. Bebchuk and Cohen (2005) find that an important component of both the G-index and the E-index is classified boards.

[31] To be more precise, as in Stuart and Yim (2010), first I define *directorship count* as a count of the number of positions in distinct boards held by a director. Aggregating this to the firm level, *average directorship* is the mean number of directorship count held by the company directors.

Corporate governance may also influence target selection. The interlocking directors might facilitate merger process not because of informational reasons, but because they act as negotiators so as to prevent anti-takeover defenses. D'Aveni and Kesner (1993) find that the deals in which the top managers of both the bidder and the target share elite connections (including directorships) are less likely to involve target resistance than the deals without such connections. If this is why interlocking directors are relevant for target selection, above all, we would expect that there are anti-takeover defenses present in these potential targets. However, Table 6 already provides evidence on that this is not the case. Indeed, if at all, the interlocking firms are less entrenched than the non-interlocking firms. Next, under this alternative explanation, we would expect to see a stronger effect of the interlocking directors for highly entrenched firms, with entrenchment defined as the degree of anti-takeover defenses in place. As in Masulis, Wang, and Xie (2007), I define a *high entrenchment* dummy, which takes value 1 if the firm has an E-index greater than 2, and 0 otherwise. I include an interaction variable between high entrenchment dummy and interlocking dummy in the regressions. If the purpose of interlocking directors is to overcome entrenchment issues, we would expect to see a significantly positive coefficient for this interaction term. On the contrary to the entrenchment explanation, in Panel A of Table 19, we see that the coefficient is insignificantly negative for all specifications.

[Insert Table 19: Testing the Alternative Explanation: Entrenchment]

Entrenchment theory also suggests that controlling for corporate governance variables would significantly affect the results. Panels B, C and D of Table 19 reports the results of the regressions when G-index, E-index, classified board indicator are used as controls, one at a time. Even though the economic impact of the interlocking dummy decreases to some extent, coefficients on the interlocking dummy is still positive and highly significant in all specifications. It is important to note that a great majority of the observations do not have corporate governance variables defined, so that the results of this section should be taken with caution. Nevertheless, analysis with this small sample reveals that entrenchment hypothesis is not a plausible candidate in explaining the target selection phenomenon.

8 Concluding Remarks

This paper analyzes the role of interlocking directors in mergers and acquisitions within an information asymmetry context. According to the model I develop, acquirers are more likely

to select the *acquainted targets* which, empirically, would correspond to firms that have an *interlocking director* with the acquirer. I find strong empirical support for model's implications. Conditioning on firms with similar industry and size characteristics, having an interlocking director with the acquirer raises the likelihood of becoming a target by 12 percent. I explain this by informational flows through interlocking directors, which help to overcome the information asymmetry between the target and the acquirer.

As a further evidence of the information asymmetry explanation, I find that acquirers are more likely to select the interlocking firms, particularly when these firms experience poor past performance, when they are small, when they are risky, or when they belong to a different industry. Moreover, acquirers that have high financial leverage, or insufficient cash holdings, or limited liquidity are further biased towards interlocking targets, and this is consistent with such acquirers' willingness to use stock as the payment method. To the extent that the above cases are those where target or acquirer-specific information is more valuable, results indicate that interlocking directors have a significant role in target selection. I also show that results are not driven by alternative explanations, such as network centrality or entrenchment.

My model not only explains the target selection phenomenon, but also predicts that an interlocking potential target that is not selected is prone to bad performance. I test the performance of non-selected interlocking firms and find supporting evidence. These firms have worse accounting and stock market performance as compared to their peers. In future research, the portfolio implications of the model's prediction on non-selected interlocking firms may be analyzed in further detail as some interesting results have already emerged. Also, the model can be extended to analyze the bidding behavior, negotiation process and method of payment; and the predictions can be tested using the data. Overall, the evidence presented in this paper suggests that interlocking directors mitigate inefficiencies that arise from informational advantages of the target or the acquirer in M&As, and this issue deserves further attention.

Appendix 1: Proofs

Proof of Lemma 1:

Let us first remember bidder's posteriors on type of the acquainted target after observing the private signal:

$Prob(v_1 = v_H|\eta = h) = \frac{q\phi}{q\phi+(1-q)(1-\phi)} = \Phi_H$

$Prob(v_1 = v_L|\eta = h) = 1 - \Phi_H$

$Prob(v_1 = v_L|\eta = l) = \frac{(1-q)\phi}{(1-q)\phi+(q)(1-\phi)} = \Phi_L.$

$Prob(v_1 = v_H|\eta = l) = 1 - \Phi_L$

From this, it is easy to write the bidder's valuations of targets after receiving the signal:

$E[v_1|\eta = h] = \Phi_H v_H + (1 - \Phi_H)v_L$

$E[v_1|\eta = l] = \Phi_L v_L + (1 - \Phi_L)v_H$

$E[v_2] = qv_H + (1 - q)v_L = \overline{v}.$

Note that, since $\phi > 1/2$ (i.e., the signal is informative), we have that $E[v_1|\eta = h] > \overline{v} > E[v_1|\eta = l]$.

If the target is of type H, it will accept the offer if $p \geq v_H$. If the target is of type L, it will accept the offer if $p \geq v_L$. If bidder bids $p < v_L$, non potential target will accept the offer, hence there will be no transaction. Hence, we always restrict our attention to the cases where $p \geq v_L$. This generalizes to the bids for any target. Now let us focus our attention on the unacquainted target.

If bidder bids $v_L \leq p < v_H$ and the unacquainted target is of type L, the profits of the bidder will be: $\Pi = v_L + w - b$. Since this is decreasing in p, the bidder will offer the smallest possible p that the target will accept, which is $p = v_L$. Bidder's profits will be: $\Pi = w$. But if the target is of type H, it will reject the offer, so bidder's profits will be zero. Bidder's expected profits when $p = v_L$ is $E[\Pi] = (1 - q)(v_L + w - v_L) = (1 - q)w$.

If bidder bids $p \geq v_H$, again, as profits of the bidder is decreasing in p, the bidder will offer the smallest possible p that both targets will accept, which is $p = v_H$. Bidder's expected profits when $b = v_H$ is $E[\Pi] = E[v_2] + w - v_H = [qv_H + (1 - q)v_L] + w - v_H = w - [(1 - q)(v_H - v_L)]$.

Bidder will offer $p = v_H$ to the unacquainted target if $(1 - q)w \leq w - [(1 - q)(v_H - v_L)]$

$\Rightarrow w \geq [\frac{(1-q)}{q}(v_H - v_L)] \Rightarrow \frac{w}{v_H - v_L} \geq \frac{(1-q)}{q}.$

Otherwise, bidder will offer $p = v_L$ to the unacquainted target. Since $(1 - q)w > 0$, the bidder will make an offer with certainty.

Proof of Lemma 2:

If the acquainted target is of type H, it will accept the offer if $p \geq v_H$. If the acquainted target is of type L, it will accept the offer if $p \geq v_L$.

a. High signal

Let's assume the bidder has received the signal $\eta = h$.

If bidder bids $v_L \leq p < v_H$ and the acquainted target is of type L, the profits of the bidder will be $\Pi = v_L + w - b$. Since this is decreasing in p, the bidder will offer the smallest possible p that the target will accept, which is $p = v_L$. Bidder's profits will be $\Pi = w$. But if the target is of type H, it will reject the offer, so bidder's profits will be zero. Bidder's expected profits when $p = v_L$ will be $E[\Pi|\eta = h] = Prob(v_L|\eta = h)(v_L + w - v_L) = (1 - \Phi_H)w$.

If bidder bids $p \geq v_H$, as profits of the bidder is decreasing in p, the bidder will offer the smallest possible p that both targets will accept, which is $p = v_H$. Bidder's expected profits when $p = v_H$ will be $E[\Pi|\eta = h] = E[v_1|\eta = h] + w - v_H = [\Phi_H v_H + (1 - \Phi_H)v_L] + w - v_H = w - [(1 - \Phi_H)(v_H - v_L)]$.

Bidder will offer $p = v_H$ to the acquainted target if $(1 - \Phi_H)w \leq w - [(1 - \Phi_H)(v_H - v_L)]$

$\Rightarrow w \geq [\frac{(1-\Phi_H)}{\Phi_H}(v_H - v_L)] \Rightarrow \frac{w}{v_H - v_L} \geq \frac{(1-\Phi_H)}{\Phi_H}$.

Otherwise, bidder will offer $p = v_L$ to the acquainted target. Since $(1 - \Phi_H)w > 0$, the bidder will make an offer with certainty.

b. Low signal

Let's assume the bidder has received the signal $\eta = h$.

If the bidder bids $v_L \leq p < v_H$ and the acquainted target is of type L, the profits of the bidder will be $\Pi = v_L + w - b$. Since this is decreasing in p, the bidder will offer the smallest possible p that the target will accept, which is $p = v_L$. Bidder's profits will be $\Pi = w$. But if the target is of type H, it will reject the offer, so bidder's profits will be zero. Bidder's expected profits when $b = v_L$ will be $E[\Pi|\eta = l] = Prob(v_L|\eta = l)(v_L + w - v_L) = \Phi_L w$.

If the bidder bids $p \geq v_H$, as profits of the bidder is decreasing in p, the bidder will offer the smallest possible p that both targets will accept, which is $p = v_H$. Bidder's expected profits when $p = v_H$ will be $E[\Pi|\eta = l] = E[v_1|\eta = l] + w - v_H = [\Phi_L v_L + (1 - \Phi_L)v_H] + w - v_H = w - [\Phi_L(v_H - v_L)]$.

Bidder will offer $p = v_H$ to the acquainted target if $\Phi_L w \leq w - [\Phi_L(v_H - v_L)]$

$\Rightarrow w \geq \frac{\Phi_L(v_H - v_L)}{1-\Phi_L} \Rightarrow \frac{w}{v_H - v_L} \geq \frac{\Phi_L}{1-\Phi_L}$.

Otherwise, bidder will offer $p = v_L$ to the acquainted target. Since $(\Phi_L)w > 0$, the bidder will make an offer with certainty.

Proof of Proposition 1:

Note that:

$Prob(v_H|\eta = h) = \Phi_H > q \Rightarrow \frac{1-\Phi_H}{\Phi_H} < \frac{1-\Phi_H}{q} < \frac{1-q}{q}$.

$Prob(v_L|\eta = l) = \Phi_L > (1-q) \Rightarrow \frac{1-q}{q} < \frac{1-q}{1-\Phi_L} < \frac{\Phi_L}{1-\Phi_L}$.

Note also that $(1-\Phi_H)w < (1-q)w < (\Phi_L)w$. This implies:

Offering v_L to $T1|\eta = h \prec$ Offering v_L to $T2 \prec$ Offering v_L to $T1|\eta = l$.

Finally, $w - (\Phi_L)(v_H - v_L) < w - (1-q)(v_H - v_L) < w - (1-\Phi_H)(v_H - v_L)$. This implies:

Offering v_H to $T1|\eta = l \prec$ Offering v_H to $T2 \prec$ Offering v_H to $T1|\eta = h$.

However, the cutoffs $\frac{1-\Phi_H}{q}$ and $\frac{1-q}{1-\Phi_L}$ will be decisive. The below graph will help us making our conclusions.

$\frac{w}{v_H - v_L}$:	$\rightarrow \frac{1-\Phi_H}{\Phi_H}$	$\frac{1-\Phi_H}{\Phi_H} \rightarrow \frac{1-\Phi_H}{q}$	$\frac{1-\Phi_H}{q} \rightarrow \frac{1-q}{q}$	$\frac{1-q}{q} \rightarrow \frac{1-q}{1-\Phi_L}$	$\frac{1-q}{1-\Phi_L} \rightarrow \frac{\Phi_L}{1-\Phi_L}$	$\frac{\Phi_L}{1-\Phi_L} \rightarrow$
Offer to the unacq. target: Profits:	v_L $(1-q)w$	v_L $(1-q)w$	v_L $(1-q)w$	v_H $w - (1-q)\times$ $(v_H - v_L)$	v_H $w - (1-q)\times$ $(v_H - v_L)$	v_H $w - (1-q)\times$ $(v_H - v_L)$
Offer to the acq. tar.$\|\eta = l$: Profits:	v_L $(\Phi_L)w$	v_L $(\Phi_L)w$	v_L $(\Phi_L)w$	v_L $(\Phi_L)w$	v_L $(\Phi_L)w$	v_H $w - (\Phi_L)\times$ $(v_H - v_L)$
Offer to the acq. tar.$\|\eta = h$: Profits:	v_L $(1-\Phi_H)w$	v_H $w - (1-\Phi_H)\times$ $(v_H - v_L)$	v_H $w - (1-\Phi_H)\times$ $(v_H - v_L)$	v_H $w - (1-\Phi_H)\times$ $(v_H - v_L)$	v_H $w - (1-\Phi_H)\times$ $(v_H - v_L)$	v_H $w - (1-\Phi_H)\times$ $(v_H - v_L)$

Comparison of expected profits above gives us the bidder's optimum strategy conditional on each signal. Upon receiving a high signal, the bidder will offer $p = v_H$ to the acquainted target if $\frac{w}{v_H - v_L} \geq \frac{1-\Phi_H}{q}$. Otherwise, bidder will offer $p = v_L$ to the unacquainted target. Upon receiving a low signal, the bidder will offer $p = v_H$ to the unacquainted target if $\frac{w}{v_H - v_L} \geq \frac{1-q}{1-\Phi_L}$. Otherwise, bidder will offer $p = v_L$ to the ac-

quainted target. This completes the proposition, and I provide a summary table below.

$\frac{w}{v_H - v_L}$:	$\to \frac{1-\Phi_H}{\Phi_H}$	$\frac{1-\Phi_H}{\Phi_H} \to \frac{1-\Phi_H}{q}$	$\frac{1-\Phi_H}{q} \to \frac{1-q}{q}$	$\frac{1-q}{q} \to \frac{1-q}{1-\Phi_L}$	$\frac{1-q}{1-\Phi_L} \to \frac{\Phi_L}{1-\Phi_L}$	$\frac{\Phi_L}{1-\Phi_L} \to$
Offer$\|\eta = l$: Profits:	v_L to acq. tar. $(\Phi_L)w$	v_L to acq. tar. $(\Phi_L)w$	v_L to acq. tar. $(\Phi_L)w$	v_L to acq. tar. $(\Phi_L)w$	v_H to unacq. tar. $w - (1-q)\times$ $(v_H - v_L)$	v_H to unacq. tar. $w - (1-q)\times$ $(v_H - v_L)$
Offer$\|\eta = h$: Profits:	v_L to unacq. tar. $(1-q)w$	v_L to unacq. tar. $(1-q)w$	v_H to acq. tar. $w - (1-\Phi_H)\times$ $(v_H - v_L)$	v_H to acq. tar. $w - (1-\Phi_H)\times$ $(v_H - v_L)$	v_H to acq. tar. $w - (1-\Phi_H)\times$ $(v_H - v_L)$	v_H to acq. tar. $w - (1-\Phi_H)\times$ $(v_H - v_L)$

Appendix 2: Variable Definitions

Variable	Definition
Accounting Liquidity	The ratio of net liquid assets to total assets (Compustat items (4−5)/6)).
All Cash	Dummy variable equal to 1 if the deal is purely cash financed, and 0 otherwise.
All Stock	Dummy variable equal to 1 if the deal is purely stock financed, and 0 otherwise.
Average Directorship	The mean number of board seats held by the directors on the firm's board.
Board Size	The number of directors on the firm's board.
Board Independence	The percentage of *outside directors* on the firm's board.
Book Equity	*Stockholders equity* minus *preferred stock* plus *deferred taxes*.
Book to Market	The ratio of *book equity* to *market capitalization*.
Busy Board	Dummy variable equal to 1 if the majority of *outside directors* hold three or more directorships, and 0 otherwise.
Cash over Net Assets	The ratio of cash and marketable securities to *total assets* minus cash (Compustat items 1/(6−1)).
Classified Board	Dummy variable equal to 1 if the firm has a classified board, and 0 otherwise.
Debt to Equity	The ratio of debt (Compustat item 9) to *market capitalization*.
Deferred Taxes	Deferred taxes and investment tax credit (Compustat item 35), or, 0 if that is missing.
Degree Centrality	The number of interlocking outside boards, normalized by dividing over the maximum value for the corresponding year.
Diversifying	Dummy variable equal to 1 if the target and the bidder are from different industries, with industry being defined as the two-digit SIC code, and 0 otherwise.
E-index	Entrenchment index based on 6 provisions taken from Bebchuk et al. (2009).
G-index	Governance index based on 24 provisions taken from Gompers et al. (2003).
Growth of Sales	The proportional change in sales over the fiscal year (ln(Compustat items 12/12(t−1))).
High Entrenchment	Dummy variable equal to 1 if the firm's E-index is greater than or equal to 2, and 0 otherwise.
High Premium	The ratio of the price paid for target shares recorded by SDC to the *high price*.
High Price	The 52-weeks high stock price of the target over 52 weeks ending 4 weeks prior to the announcement date.
Higher Price	Dummy variable equal to 1 if *high price* is higher than the price paid for target shares recorded by SDC, and 0 otherwise.
High Tech	Dummy variable equal to 1 if both the target and the bidder belong to a high tech industry as defined in Loughran and Ritter (2004), and 0 otherwise.
Hostile	Dummy variable equal to 1 if the deal is recorded by SDC as "hostile" or "unsolicited", and 0 otherwise.

Variable	Definition
Industry Herfindahl	Index variable that equals to sum of the squares of market shares (in sales) over all firms within the industry.
Interlock Count	The total number of interlocking directors with other firms.
Interlocking	Dummy variable equal to 1 if there exists at least one director that is common to both the target and the acquirer at the time of the deal announcement, and 0 otherwise.
Institutional Ownership	The fraction of firm stock owned by institutional investors required to report 13F filings.
Market Capitalization	The stock price multiplied by the number of shares outstanding at the end of the fiscal year (Compustat items 24×25).
Market Value	*Total assets* plus *market capitalization* minus *book equity*.
Merger of Equals	Dummy variable equal to 1 if the deal is structured as a merger of equals, and 0 otherwise.
Net Market Leverage	The ratio of debt minus cash and marketable securities (Compustat items 9−1) to *market value*.
Outside Directors	The directors whose primary affiliations are with another firm.
Poison Pill	Dummy variable equal to 1 if a poison pill exists, and 0 otherwise.
Proxy Fight	Dummy variable equal to 1 if a proxy fight has taken place, and 0 otherwise.
Pre-Bid Competition	Dummy variable equal to 1 if another bid by a different bidder is recorded by SDC in the six months before the current bid, and 0 otherwise.
Post-Bid Competition	Dummy variable equal to 1 if another bid by a different bidder is recorded by SDC in the six months after the current bid, and 0 otherwise.
Preferred Stock	Liquidating value of preferred stock (Compustat item 10), or, if that is missing, the first available of the redemption value of preferred stock (Compustat item 56) or total preferred stock (Compustat item 130).
Premium	The ratio of the price paid for target shares recorded by SDC to the stock price of the target on 4 weeks prior to the announcement date.
Price to Earnings	The ratio of the year-end stock price to earnings per share (Compustat items 24/58).
Relative Size	The ratio of the *market value* of the target to the *market value* of the acquirer on 4 weeks prior to the announcement date.
Return on Assets	The ratio of operating income before depreciation to total assets of the prior fiscal year (Compustat items 13/6(t−1)).
Return on Equity	The ratio of income before extraordinary items (adjusted for common stock equivalents) to average equity for the prior fiscal year (Compustat items 20/(60+60(t−1))/2).
Same Industry	Dummy variable equal to 1 if the target belongs to the same industry as the bidder, with industry being defined as the two-digit SIC code, and 0 otherwise.

Variable	Definition
Same State	Dummy variable equal to 1 if the target is located in the same state (Compustat state variable, or if it is missing, SDC state variable) as the bidder, and 0 otherwise.
Stockholders Equity	Total stockholders equity (Compustat item 144), or, if that is missing, the first available of total common equity plus total preferred stock (Compustat items 60+130) or total assets minus total liabilities (Compustat items 6−181).
Success	Dummy variable equal to 1 if the deal is completed, and 0 otherwise.
Target Termination Fee	Dummy variable equal to 1 if target termination fee exists, and 0 otherwise.
Tender Offer	Dummy variable equal to 1 if the deal is tender offer, and 0 otherwise.
Toehold	Dummy variable equal to 1 if the fraction of the target's common stock owned by the bidder as of the deal announcement date is greater than 5%, and 0 otherwise.
Total Assets	The book value of assets (Compustat item 6).

References

Renee B. Adams and Daniel A. Ferreira. A theory of friendly boards. *Journal of Finance*, 62:217–250, 2007.

George A. Akerlof. The market for "lemons": Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(3):488–500, 1970.

Andres Almazan, Adolfo de Motta, Sheridan Titman, and Vahap Uysal. Financial structure, acquisition opportunities, and firm locations. *Journal of Finance*, 65(2): 529–563, 2010.

Gregor Andrade, Mark Mitchell, and Erik Stafford. New evidence and perspectives on mergers. *Journal of Economic Perspectives*, 15(2):103–120, 2001.

Brad M. Barber, Donald Palmer, and James Wallace. Determinants of conglomerate and predatory acquisitions: evidence from the 1960s. *Journal of Corporate Finance*, 1(3-4):283–318, April 1995.

Lucian A. Bebchuk and Alma Cohen. The costs of entrenched boards. *Journal of Financial Economics*, 78:409–433, 2005.

Lucian A. Bebchuk, Alma Cohen, and Allen Ferrell. What matters in corporate governance? *Review of Financial Studies*, 22(2):783–827, 2009.

Sandra Betton, B. Espen Eckbo, and Karin S. Thorburn. Merger negotiations and the toehold puzzle. *Journal of Financial Economics*, 91:158–178, 2009.

Andriy Bodnaruk, Massimo Massa, and Andrei Simonov. Investment banks as insiders and the market for corporate control. *Review of Financial Studies*, 22(12): 4989–5026, 2009.

Christa H. S. Bouwman. Corporate governance propagation through overlapping directors. *Review of Financial Studies*, 24(7):2358–2394, 2011.

Christa H.S. Bouwman and Yuhai Xuan. Director overlap and firm financial policies. Working Paper, 2010.

Ye Cai and Merih Sevilir. Board connections and m&a transactions. *Journal of Financial Economics, forthcoming*, 2012.

Mark M. Carhart. On persistence in mutual fund performance. *The Journal of Finance*, 52:57–82, 1997.

Jeffrey L. Coles, Naveen D. Daniel, and Lalitha Naveen. Boards: Does one size fit all? *Journal of Financial Economics*, 87(2):329–356, 2008.

K. J. Martijn Cremers, Vinay B. Nair, and Kose John. Takeovers and the cross-section of returns. *Review of Financial Studies*, 22(4):1409–1445, 2009.

Richard A. D'Aveni and Idalene F. Kesner. Top managerial prestige, power and tender offer response: a study of elite social networks and target firm cooperation during takeovers. *Organization Science*, 4(2):123–151, 1993.

B. Espen Eckbo. Horizontal mergers, collusion, and stockholder wealth. *Journal of Financial Economics*, 11, 1983.

B. Espen Eckbo. Mergers and the market concentration doctrine: Evidence from the capital market. *Journal of Business*, 58, 1985.

B. Espen Eckbo. Mergers and the value of antitrust deterrence. *The Journal of Finance*, 47(3):1005–1029, 1992.

B. Espen Eckbo, Ronald M. Giammarino, and Rober L. Heinkel. Asymmetric information and the medium of exchange in takeovers theory and tests. *Review of Financial Studies*, 3(4):651–675, 1990.

Alex Edmans, Itay Goldstein, and Wei Jiang. The real effects of financial markets: The impact of prices on takeovers. *The Journal of Finance, forthcoming*, 2012.

Rudiger Fahlenbrach, Angie Low, and Rene M. Stulz. The dark side of outside directors: Do they quit when they are most needed? Working Paper, 2010.

Eugene F. Fama and Kenneth French. Common risk factors in the return on bonds and stocks. *Journal of Financial Economics*, 33:3–56, 1993.

Stephen P. Ferris, Murali Jagannathan, and A. C. Pritchard. Too busy to mind the business? monitoring by directors with multiple board appointments. *Journal of Finance*, 58(3):1087–1111, 2003.

Eliezer Fich and Anil Shivdasani. Are busy boards effective monitors? *Journal of Finance*, 61(2):689–724, 2006.

Michael J. Fishman. Preemptive bidding and the role of the medium of exchange in acquisitions. *Journal of Finance*, 44(1):41–57, 1989.

Paul A. Gompers, Joy L. Ishii, and Andrew Metrick. Corporate governance and equity prices. *Quarterly Journal of Economics*, 118:107–155, 2003.

Robert G. Hansen. A theory for the choice of exchange medium in mergers and acquisitions. *Journal of Business,*, 60(1):75–95, 1987.

Milton Harris and Artur Raviv. A theory of board control and size. *Review of Financial Studies*, 21(4):1797–1832, 2008.

Joel Hasbrouck. The characteristics of takeover targets: Q and other measures. *Journal of Banking and Finance*, 9:351–362, 1985.

Jean Helwege, Christo Pirinsky, and Rene M. Stulz. Why do firms become widely held? an analysis of the dynamics of corporate ownership. *Journal of Finance*, 62(3): 995–1028, 2007.

Benjamin E. Hermalin and Michael S. Weisbach. Endogenously chosen boards of directors and their monitoring of the CEO. *American Economic Review*, 88:96–118, 1998.

David Hirshleifer. Mergers and acquisitions: Strategic and informational issues. *Handbooks in OR & MS*, 9:839–885, 1995.

Harrison Hong, Terence Lim, and Jeremy C. Stein. Bad news travels slowly: Size, analyst coverage, and the profitability of momentum strategies. *Journal of Finance*, 55:265–295, 2000.

Michael C. Jensen. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76(2):323–329, 1996.

Jun-Koo Kang and Jin-Mo Kim. The geography of block acquisitions. *Journal of Finance*, 63(6):2817–2858, 2008.

Thomas Koenig, Robert Gogel, and John Sonquist. Models of the significance of interlokcing corporate directorates. *American Journal of Economics and Socilology*, 38(2):173–186, 1979.

David F. Larcker, Eric C. So, and Charles C. Y. Wang. Board centrality and firm performance. Working Paper, 2011.

James S. Linck, Jeffry M. Netter, and Tina Yang. The determinants of board structure. *Journal of Financial Economics*, 87(2):308–328, 2008.

Tim Loughran and Jay Ritter. Why has ipo underpricing changed over time? *Financial Management*, 33:5–37, 2004.

Yuanzhi Luo. Do insiders learn from outsiders? evidence from mergers and acquisitions. *Journal of Finance*, 60(4):1951–1982, 2005.

Baker Malcolm, Xin Pan, and Jeffrey Wurgler. A reference point theory of mergers and acquisitions. NBER Working Paper, 2009.

Ronald W. Masulis, Cong Wang, and Fei Xie. Corporate governance and acquirer returns. *Journal of Finance*, 62(4):1851–1889, 2007.

Gregory S. Miller. Earnings performance and discretionary disclosure. *Journal of Accounting Research*, 40:173–204, 2002.

Randall Morck, Andrei Shleifer, and Robert W. Vishny. *Corporate Takeovers: Causes and Consequences*, chapter Characteristics of Targets of Hostile and Friendly Takeovers, pages 101–129. University of Chicago Press, 1988.

Stewart J. Myers and Nicholas S. Majluf. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13:187–221, 1984.

Donald Palmer. Broken ties: Interlocking directorates and intercorporate coordination. *Administrative Science Quarterly*, 28(1):40–55, 1993.

Matthew Rhodes-Kropf and David T. Robinson. The market for mergers and the boundaries of the firm. *Journal of Finance*, 63(3):1169–1211, 2008.

Robert Schonlaua and Param Vir Singh. Board networks and merger performance. Working Paper, 2009.

Laurence Schumann. Patterns of abnormal returns and the competitive effects of horizontal mergers. *Review of Industrial Organizetion*, 8(6):167–198, 679-696 1990.

Anil Shivdasani. Board composition, ownership structure, and hostile takeovers. *Journal of Accounting and Economics*, 16:167–198, 1993.

Moon H. Song and Ralph A. Walkling. Abnormal returns to rivals of acquisition targets: A test of the "acquisition probability hypothesis". *Journal of Financial Economics*, 55:143–171, 2000.

Toby E. Stuart and Soojin Yim. Board interlocks and the propensity to be targeted in private equity transactions. *Journal of Financial Economics*, 97(1):174–189, 2010.

Robert E. Verrechia. Discretionary disclosure. *Journal of Accounting and Economics*, 5:179–194, 1983.

Kangzhen Xie. The deal process, asymmetric bidders and target premia. Working Paper, 2010.

Table 1: Sample Selection

This table records the detailed sample selection process. I obtain the initial M&A sample from Securities Data Company's (SDC) Mergers and Acquisitions database; data regarding directors from the Compact Disclosure CD-ROMs and Riskmetrics Directors database; the stock price data from the Center for Research in Security Prices (CRSP) daily files and company financial data from Compustat annual files.

No. of Obs. After Query	Query Description
	Machine search in SDC
	SDC Domestic M&As announced between 1/1/1996 and 12/31/2005
41,100	Deal type included: disclosed value M&As, leveraged buyouts and tender offers
40,050	Percent of shares acquirer is seeking to own after transaction: 50% or higher
40,050	Target Nation: United States
6,531	Target Public Status: Public
5,817	Acquirer Nation: United States
3,906	Acquirer Public Status: Public
3,734	Deal value is $ 5 million or higher
	Manual filtering of data
	Exclude:
3,681	Deal is intended or still pending
3,632	Self tender, division sale, bankruptcy process deals
3,505	Bidder is already a majority owner
3,412	Bidder and target have common parent company
3,408	Duplicate entries
	Merging with other databases
2,752	Both bidder and target are identified in CRSP database, matched by CUSIP or ticker and company name
2,349	Both bidder and target are identified in directors data set, matched by CUSIP or ticker and company name
2,096	Target has control variables available in the prior fiscal year end, obtained by using Compustat annual files
2,088	Target has lag return and volatility data available in prior six months, obtained by using CRSP daily files; final sample

Table 2: M&A Sample by Announcement Year and Deal Type

This table presents the distribution of the M&A sample by announcement year and presence of an interlocking director. *Interlocking deal* is a deal in which there exists at least one director that is common to both the target and the acquirer. *Non-interlocking deal* is a deal in which there exists no such common director.

	Number of All M&A Deals	Number of Interlocking Deals	Number of Non-Interlocking Deals	All Deals % Over Years
1996	223	9	214	10.68
1997	289	11	278	24.52
1998	297	9	288	14.22
1999	299	10	289	14.32
2000	259	13	246	12.40
2001	206	13	193	9.87
2002	109	3	106	5.22
2003	135	3	132	6.47
2004	144	2	142	6.90
2005	127	3	124	6.08
Total	2,088	76	2,012	100.00 %

Table 3: M&A Sample by Industry Distribution of the Target and the Acquirer

This table presents the industry distribution of the target and the acquirer based on the United States Department of Labor's Standard Industrial Classification (SIC) code divisions. SIC code industry divisions are: Agriculture, Forestry, Fishing; Mining; Construction; Manufacturing; Transportation, Public Utilities; Wholesale, Retail Trade; Finance; and Services. The final column and row present the industry distribution of the target and the acquirer for the sample of interlocking deals.

	Acquirer Industry									
	Agricult., Forestry, Fishing	Mining	Construct.	Manufact.	Transport., Public Utilities	Wholesale, Retail Trade	Finance	Services	All Deals Total	Interlocking Deals
Target Industry										
Agriculture, Forestry, Fishing	1	0	0	2	0	0	0	0	3	0
Mining	0	53	1	13	13	2	3	0	85	7
Construction	0	0	4	0	1	1	2	0	8	0
Manufacturing	0	11	2	519	14	27	19	44	636	25
Transportation, Public Utilities	0	1	0	7	132	1	8	9	158	4
Wholesale, Retail Trade	0	0	0	40	5	79	5	20	149	11
Finance	0	0	0	7	6	3	533	17	566	8
Services	0	1	1	87	33	14	26	321	483	21
All Deals Total	1	66	8	675	204	127	596	411	2,088	76
Interlocking Deals	0	9	0	27	6	5	12	17	76	

Table 4: Descriptive Statistics for the M&A Sample

This table presents the deal, target and acquirer characteristics for the M&A sample. Variables are defined in Appendix 2. I report the mean, median, standard deviation and interquartile range. Unless stated differently, the number of observations (N) is 2,088.

	Mean	Median	Std. Dev.	Interquartile Range
Deal				
Interlocking Dummy	0.04			
Success Dummy	0.88			
All Cash Dummy, N=1974	0.29			
All Stock Dummy, N=1974	0.47			
Hostile Dummy	0.07			
Same Industry Dummy	0.57			
Same State Dummy	0.29			
Tech Deal Dummy	0.04			
Toehold Dummy	0.03			
Tender Offer Dummy	0.16			
Poison Pill Dummy	0.01			
Proxy Fight Dummy	0.00			
Merger Of Equals Dummy	0.03			
Target Termination Fee Dummy	0.67			
Pre-Bid Competition Dummy	0.04			
Post-Bid Competition Dummy	0.04			
Target				
Return on Equity	-0.13	0.09	2.83	0.19
Book to Market	0.67	0.55	0.71	0.49
Market Capitalization	1268.78	170.77	5099.24	575.45
Growth of Sales	0.17	0.11	0.42	0.26
Price to Earnings	12.11	13.22	94.42	22.63
Debt to Equity	1.17	0.25	18.60	0.86
Institutional Ownership	0.36	0.32	0.27	0.43
Bidder				
Return on Equity, N=1966	-0.37	0.14	18.79	0.13
Book to Market, N=1950	0.47	0.39	0.42	0.37
Market Capitalization, N=1950	13355.75	1785.01	38463.66	7820.82
Growth of Sales, N=1949	0.22	0.14	0.44	0.29
Price to Earnings, N=1949	20.72	17.15	243.44	18.25
Debt to Equity, N=1968	0.51	0.37	4.16	0.78

Table 5: Descriptive Statistics for Interlocking and Non-Interlocking Deals

This table presents the deal characteristics for the subsamples of *interlocking* and *non-interlocking deals*. Variables are defined in Appendix 2. I report the mean and standard deviation. Unless stated differently, the number of observations (N) is 2,088.

	Interlocking Deals		Non-Interlocking Deals	
	Mean	Std. Dev.	Mean	Std. Dev.
Success Dummy	0.83		0.88	
All Cash Dummy, N=1974	0.32		0.29	
All Stock Dummy, N=1974	0.47		0.47	
Hostile Dummy	0.04		0.07	
Same Industry Dummy	0.46		0.58	
Same State Dummy	0.50		0.28	
Tech Deal Dummy	0.01		0.04	
Toehold Dummy	0.30		0.02	
Tender Offer Dummy	0.20		0.15	
Poison Pill Dummy	0.00		0.01	
Proxy Fight Dummy	0.00		0.00	
Merger Of Equals Dummy	0.04		0.02	
Pre-Bid Competition Dummy	0.03		0.04	
Post-Bid Competition Dummy	0.07		0.03	
Deal Value (M$)	2421.72	8933.33	1891.70	7386.03
Target Fees (M$), N=1329	5.95	9.46	5.60	8.21
Acquirer Fees (M$), N=719	5.74	9.24	4.36	7.12
Total Fees (M$), N=658	11.48	20.10	10.81	15.92
Target Fees (%), N=1329	0.76	0.68	0.88	0.95
Acquirer Fees (%), N=719	0.44	0.55	0.50	0.71
Total Fees (%), N=658	1.15	1.15	1.29	1.46

Table 6: Descriptive Statistics for Interlocking and Non-Interlocking Targets

This table presents the descriptive statistics for targets in *interlocking* and *non-interlocking deals*. Variables are defined in Appendix 2. I report the mean, median and difference tests. The numbers in the test of difference columns denote p-values. Unless stated differently, the number of observations (N) is 2,088.

	Interlocking Deals (A)		Non-Interlocking Deals (B)		Test of Difference (A-B)	
	Mean	Median	Mean	Median	t-test	Wilcoxon z-test
Return on Equity	-0.17	0.05	-0.13	0.09	0.89	0.03**
Book to Market	0.89	0.63	0.66	0.54	0.31	0.71
Market Capitalization	1844.72	166.66	1247.02	171.06	0.01***	0.03*
Growth of Sales	0.13	0.10	0.18	0.11	0.40	0.76
Price to Earnings	3.23	7.59	12.44	13.35	0.40	0.02**
Debt to Equity	0.54	0.16	1.20	0.26	0.76	0.07*
Institutional Ownership	0.35	0.34	0.36	0.32	0.77	0.87
Volatility (daily, 6 months, %)	0.24	0.14	0.20	0.11	0.22	0.03**
Lagged Return	0.05	0.00	0.19	0.14	0.06*	0.00***
Std. Deviation (monthly, 2 years), N=1784	0.17	0.14	0.15	0.12	0.10	0.06*
Board Size	7.54	7.00	7.87	7.00	0.44	0.54
Busy Board Dummy	0.21		0.13		0.05**	
Degree Centrality	0.13	0.09	0.09	0.05	0.00***	0.00***
Avgerage Directorship	2.07	1.83	1.59	1.40	0.00***	0.00***
Interlock Count	8.21	6.00	4.98	3.00	0.00***	0.00***
G-Index, N=577	7.96	8.00	9.32	9.00	0.02**	0.02**
E-Index, N=577	1.78	2.00	2.36	2.00	0.03	0.02**
Classified Board Dummy, N=577	0.48		0.61		0.20	
High Entrenchment Dummy, N=577	0.26		0.45	0.00	0.07*	

Table 7: Descriptive Statistics for Interlocking and Non-Interlocking Acquirers

This table presents the descriptive statistics for acquirers in *interlocking* and *non-interlocking deals*. Variables are defined in Appendix 2. I report the mean, median and difference tests. The numbers in the test of difference columns denote p-values. The number of observations (N) is stated next to each variable.

	Interlocking Deals (A)		Non-Interlocking Deals (B)		Test of Difference (A-B)	
	Mean	Median	Mean	Median	t-test	Wilcoxon z-test
Return on Equity, N=1966	0.00	0.11	-0.38	0.14	0.86	0.06*
Book to Market, N=1950	0.72	0.49	0.46	0.39	0.44	0.09*
Market Capitalization, N=1950	16767.90	1157.65	13223.04	1814.44	0.00***	0.01**
Growth of Sales, N=1949	0.26	0.15	0.22	0.14	0.40	0.61
Price to Earnings, N=1949	70.09	13.38	18.80	17.28	0.08*	0.04**
Debt to Equity, N=1968	0.74	0.39	0.50	0.37	0.63	0.57
Net Market Leverage, N=1946	0.07	0.05	0.03	0.02	0.06*	0.08*
Cash over Net Assets, N=1972	0.22	0.08	0.34	0.06	0.29	0.45
Accounting Liquidity, N=1409	0.18	0.14	0.24	0.20	0.04**	0.03**

Table 8: Interlocking Directors and the Probability Of Becoming a Target

This table presents the coefficient estimates of the probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise. For each announced deal, I create a set of potential targets who belong to the same two-digit (or three-digit) SIC code industry as the actual target and has similar size (market capitalization) or book to market (BM) or debt to equity ratio (DE); and run the regressions for this sample. The variable of interest is the *interlocking dummy*, which equals to 1 if the potential target has an interlocking director with the acquirer, and 0 otherwise. The control variables are target size; return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership; industry Herfindahl index; and a dummy taking value 1 if the target and the acquirer are located in the same state, and 0 otherwise. In each regression, either year and industry or deal dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
Interlocking Dummy	0.948***	1.102***	0.874***	1.078***	1.056***	1.239***	0.896***	1.084***
	(10.51)	(8.71)	(7.19)	(6.00)	(12.11)	(10.62)	(7.10)	(6.12)
Return on Equity	–0.007	–0.006	0.002	–0.019	–0.073***	–0.065**	–0.088***	–0.044
	(–0.34)	(–0.25)	(0.07)	(–0.91)	(–3.25)	(–2.36)	(–3.54)	(–0.94)
Log Book to Market	0.040**	0.012	0.083***	0.047*			0.095***	0.070***
	(2.45)	(0.55)	(3.51)	(1.89)			(4.56)	(3.90)
Log Market Cap.					–0.051***	–0.075***	–0.016*	–0.060***
					(–5.15)	(–7.83)	(–1.81)	(–5.44)
Growth of Sales	–0.066***	1.633***	–0.104***	–2.114***	0.016	1.280***	–0.036	3.904***
	(–4.53)	(12.45)	(–3.20)	(–5.89)	(0.67)	(7.01)	(–1.23)	(22.20)
Price to Earnings	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000
	(–0.73)	(–0.82)	(–0.95)	(–0.99)	(–0.05)	(–0.12)	(–1.14)	(–0.66)
Debt to Equity	0.005	0.003	0.036***	0.019*	0.001	–0.005		
	(0.69)	(0.31)	(2.85)	(1.83)	(0.08)	(–0.38)		

Table continues to next page.

	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
Volatility	25.672***	12.873**	20.234***	12.936**	10.740**	1.091	–7.869*	–7.962
	(4.07)	(2.23)	(2.95)	(2.18)	(2.02)	(0.18)	(–1.86)	(–1.57)
Lagged Return	0.183***	0.208***	0.183***	0.222**	0.223***	0.269***	0.124**	0.180***
	(3.86)	(3.07)	(2.99)	(2.36)	(4.07)	(3.16)	(2.53)	(2.90)
Institutional Ownership	0.727***	0.901***	0.825***	1.067***	0.693***	0.827***	0.595***	0.750***
	(9.15)	(10.41)	(8.48)	(8.42)	(12.84)	(12.60)	(7.20)	(8.57)
Herfindahl Index	–0.337***	–0.544***	–0.092	–0.774***	–0.425***	–0.600***	–0.244	–0.647***
	(–3.85)	(–3.55)	(–1.11)	(–2.83)	(–3.71)	(–3.63)	(–1.21)	(–3.68)
Same State Dummy	0.784***	1.010***	0.826***	1.179***	0.812***	1.024***	0.618***	0.983***
	(4.62)	(4.89)	(4.05)	(4.46)	(5.04)	(5.47)	(3.25)	(4.01)
Intercept	–0.980***	–1.980***	–0.816***	–2.155***	–0.366***	–1.654***	–0.673***	–0.979***
	(–15.68)	(–29.18)	(–9.08)	(–23.00)	(–4.88)	(–30.70)	(–8.91)	(–15.69)
Year Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Industry Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Deal Dummy	No	Yes	No	Yes	No	Yes	No	Yes
Pseudo R-sqr.	0.149	0.189	0.177	0.173	0.158	0.201	0.157	0.290
Num. of obs.	60072	60072	32943	32920	57829	57829	57252	57252

Table 9: Interlocking Directors and Targets with High Information Asymmetry

This table presents the coefficient estimates of the probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise. For each announced deal, I create a set of potential targets who belong to the same two-digit (or three-digit) SIC code industry as the actual target and has similar size (market capitalization) or book to market (BM) or debt to equity ratio (DE); and run the regressions for this sample. In Panel A, the variable of interest is the interaction between the *interlocking dummy* and the *target's return on equity*. In Panel B, the variable of interest is the interaction between the *interlocking dummy* and the *small size dummy*, which equals to 1 if the target size is in the bottom 25% of the sample, and 0 otherwise. In Panel C, the variable of interest is the interaction between the *interlocking dummy* and the *standard deviation of the monthly target stock returns over the past two years*. Finally, in Panel D, the variable of interest is the interaction between the *interlocking dummy* and the *diversifying dummy*, which equals to 1 if the target and the acquirer belong to different industries (two-digit SIC code), and 0 otherwise. The control variables, whose coefficients are suppressed for brevity, are target size; return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership; industry Herfindahl index; and same state dummy. In each regression, either year and industry or deal dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
				Panel A: Poorly Performing Targets				
Interlocking Dummy (a)	0.908***	1.045***	0.827***	1.013***	1.025***	1.205***	0.852***	1.035***
	(8.97)	(7.48)	(5.83)	(4.99)	(10.21)	(8.96)	(6.23)	(5.32)
Return on Equity (b)	–0.001	0.002	0.008	–0.012	–0.064***	–0.056**	–0.081***	–0.035
	(–0.03)	(0.08)	(0.30)	(–0.48)	(–2.99)	(–2.05)	(–2.98)	(–0.70)
(a) × (b)	–0.297*	–0.399**	–0.279*	–0.358**	–0.408*	–0.490	–0.358***	–0.430***
	(–1.84)	(–2.04)	(–1.71)	(–1.97)	(–1.69)	(–1.56)	(–2.89)	(–3.03)
Pseudo R-sqr.	0.149	0.189	0.177	0.174	0.158	0.202	0.158	0.291
Num. of obs.	60072	60072	32943	32920	57829	57829	57252	57252

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	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
Panel B: Small Targets								
Interlocking Dummy (a)	0.922***	1.043***	0.860***	1.035***	1.019***	1.191***	0.864***	1.050***
	(8.33)	(7.18)	(5.75)	(4.91)	(10.86)	(9.41)	(5.96)	(5.26)
Small Size Dummy (c)	0.135***	–0.284***	0.127***	–0.259***	0.036	–0.009	–0.054	–0.011
	(3.50)	(–3.90)	(3.02)	(–3.50)	(1.06)	(–0.20)	(–1.44)	(–0.23)
(a) × (c)	0.297*	0.475**	0.284	0.429	0.135	0.051	0.196	–0.019
	(1.71)	(2.08)	(0.80)	(0.76)	(0.27)	(0.08)	(0.61)	(–0.04)
Pseudo R-sqr.	0.150	0.190	0.178	0.174	0.156	0.198	0.157	0.289
Num. of obs.	60072	60072	32943	32920	57829	57829	57252	57252
Panel C: Targets with High Standard Deviation of Monthly Returns								
Interlocking Dummy (a)	0.757***	0.774***	0.665**	0.667	1.172***	1.372***	0.934***	1.195***
	(3.60)	(2.86)	(2.00)	(1.55)	(5.65)	(5.27)	(3.71)	(3.36)
Standard Deviation (d)	0.191	0.046	–0.072	–0.074	0.070	–0.269	–0.397*	–0.167
	(0.81)	(0.19)	(–0.26)	(–0.27)	(0.31)	(–1.03)	(–1.84)	(–0.65)
(a) × (d)	0.998	1.913**	0.982	2.160*	–0.719	–0.882	–0.342	–0.438
	(1.28)	(1.98)	(0.92)	(1.67)	(–0.64)	(–0.69)	(–0.43)	(–0.41)
Pseudo R-sqr.	0.153	0.199	0.182	0.188	0.168	0.214	0.157	0.182
Num. of obs.	43415	43415	23648	23625	44685	44685	41228	41022
Panel D: Targets from an Industry Different to that of the Acquirer								
Interlocking Dummy (a)	0.782***	0.864***	0.745***	0.899***	0.893***	1.037***	0.708***	0.825***
	(4.63)	(3.92)	(3.60)	(3.21)	(7.66)	(6.57)	(3.99)	(3.86)
Diversifying Dummy (e)	0.062**		0.104***		0.068***		0.063**	
	(2.22)		(3.35)		(2.69)		(2.02)	
(a) × (e)	0.397	0.594*	0.371	0.571	0.393*	0.519*	0.504***	0.712***
	(1.51)	(1.75)	(1.00)	(1.21)	(1.79)	(1.70)	(2.71)	(3.25)
Pseudo R-sqr.	0.149	0.189	0.178	0.174	0.159	0.202	0.158	0.291
Num. of obs.	60072	60072	32943	32920	57829	57829	57252	57252
Year Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Industry Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Deal Dummy	No	Yes	No	Yes	No	Yes	No	Yes

Table 10: Interlocking Directors and Acquirers with Financial Constraints

This table presents the coefficient estimates of the probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise. For each announced deal, I create a set of potential targets who belong to the same two-digit (or three-digit) SIC code industry as the actual target and has similar size (market capitalization) or book to market (BM) or debt to equity ratio (DE); and run the regressions for this sample. In Panel A, the variable of interest is the interaction between the *interlocking dummy* and the *acquirer's debt to equity ratio*. In Panel B, the variable of interest is the interaction between the *interlocking dummy* and the *acquirer's cash over net assets*. Finally, in Panel C, the variable of interest is the interaction between the *interlocking dummy* and the *acquirer's accounting liquidity*. The control variables, whose coefficients are suppressed for brevity, are target size; return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership; industry Herfindahl index; and same state dummy. In each regression, either year and industry or deal dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
				Panel A: Acquirers with High Debt Ratio				
Interlocking Dummy (a)	0.859***	0.976***	0.776***	0.927***	0.901***	1.029***	0.724***	0.847***
	(9.20)	(7.75)	(5.29)	(4.40)	(11.11)	(10.02)	(4.91)	(4.74)
Acquirer Debt to Equity (b)	0.003***		0.007**		0.004**		0.024***	
	(3.77)		(2.40)		(2.07)		(3.54)	
(a) × (b)	0.191**	0.284*	0.242	0.411	0.355***	0.514***	0.520**	0.709**
	(2.12)	(1.94)	(1.02)	(1.08)	(2.95)	(2.93)	(2.31)	(2.34)
Pseudo R-sqr.	0.149	0.189	0.178	0.174	0.159	0.202	0.158	0.291
Num. of obs.	59886	59886	32803	32780	57713	57713	56754	56754

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	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
				Panel B: Cash Strapped Acquirers				
Interlocking Dummy (a)	1.104***	1.312***	1.109***	1.415***	1.207***	1.445***	1.180***	1.472***
	(11.40)	(10.05)	(8.47)	(7.19)	(10.44)	(10.00)	(12.04)	(9.33)
Acq. Cash over Net Assets (c)	–0.023*		–0.051***		–0.010		–0.080***	
	(–1.84)		(–2.84)		(–0.63)		(–4.32)	
(a) × (c)	–0.492**	–0.620***	–0.619***	–0.816***	–0.536***	–0.701***	–0.708***	–0.946***
	(–2.56)	(–2.88)	(–3.38)	(–3.59)	(–2.79)	(–3.15)	(–3.88)	(–4.17)
Pseudo R-sqr.	0.149	0.189	0.178	0.174	0.158	0.202	0.160	0.291
Num. of obs.	60072	60072	32943	32920	57829	57829	57252	57252
				Panel C: Liquidity Constrained Acquirers				
Interlocking Dummy (a)	1.157***	1.413***	1.179***	1.573***	1.246***	1.443***	1.229***	1.550***
	(7.81)	(6.75)	(5.59)	(4.98)	(8.44)	(6.98)	(6.76)	(6.10)
Acq. Accounting Liquidity (d)	–0.049		–0.152***		0.012		–0.291***	
	(–0.86)		(–2.66)		(0.29)		(–3.57)	
(a) × (d)	–0.861**	–1.250**	–1.132**	–1.774***	–0.824*	–0.968*	–1.219***	–1.832***
	(–2.21)	(–2.47)	(–2.51)	(–2.77)	(–1.94)	(–1.71)	(–3.20)	(–3.17)
Pseudo R-sqr.	0.127	0.160	0.156	0.176	0.116	0.156	0.168	0.306
Num. of obs.	34844	34844	17337	17334	26731	26731	44454	44454
Year Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Industry Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Deal Dummy	No	Yes	No	Yes	No	Yes	No	Yes

Table 11: Interlocking Directors' Effect on the Premium Paid for Target Shares

Panel A of this table presents the descriptive statistics for the premium paid by the acquirer for the target shares in interlocking and non-interlocking deals. I report the mean, median and difference tests. The numbers in the test of difference columns denote p-values. The number of observations is 1,777. Panel B of this table presents the coefficient estimates of the OLS and probit regressions where the dependent variable is one of the premium proxies. The control variables are target and acquirer size and book to market ratios; relative size; and all cash, hostile, same industry, same state, toehold, poison pill, tender offer, merger of equals, high tech, target termination fee, pre-bid and post-bid competition dummies. In each regression, either year or year and industry dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

Panel A: Univariate Analysis

	Interlocking Deals (A)		Non-Interlocking Deals (B)		Test of Difference (A-B)	
	Mean	Median	Mean	Median	t-test	Wilcoxon z-test
Premium 4 Weeks	0.37	0.36	0.45	0.57	0.32	0.10
Premium High Price	0.38	0.48	0.64	0.49	0.00***	0.00***
Higher Price Dummy	0.26	0.00	0.36	1.00	0.00***	0.00***

Panel B: Regression Analysis

	Premium 4 Weeks		Premium High Price		Higher Price Dummy	
Interlocking Dummy	–0.043	–0.092	–0.144***	–0.114**	–0.593***	–0.535***
	(–0.92)	(–1.36)	(–2.79)	(–2.30)	(–3.76)	(–3.59)
Target Log Market Cap.	–0.031***	–0.017	–0.019*	–0.022*	0.026	0.025
	(–2.66)	(–1.29)	(–1.78)	(–1.79)	(0.70)	(0.54)
Acq. Log Market Cap.	–0.023*	–0.025**	0.036***	0.027***	0.057*	0.035
	(–1.79)	(–2.08)	(3.97)	(2.98)	(1.90)	(1.03)
Target Log Book to Market	0.038*	0.065***	0.047***	0.025	0.208***	0.161***
	(1.75)	(3.23)	(3.73)	(1.40)	(3.85)	(2.92)
Acq. Log Book to Market	–0.073***	–0.056***	0.041***	–0.005	0.089*	–0.018
	(–3.13)	(–3.07)	(3.05)	(–0.34)	(1.67)	(–0.33)

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	Premium 4 Weeks		Premium High Price		Higher Price Dummy	
Relative Size	–0.226***	–0.253***	–0.006	0.001	–0.202	–0.194
	(–3.75)	(–4.06)	(–0.19)	(0.03)	(–1.49)	(–1.41)
All Cash Dummy	0.042	–0.002	0.026	0.028	–0.028	0.026
	(0.84)	(–0.03)	(1.04)	(0.97)	(–0.27)	(0.27)
Hostile Dummy	0.134**	0.061	0.025	–0.013	0.154	0.118
	(2.60)	(0.69)	(0.52)	(–0.23)	(0.78)	(0.51)
Same Industry Dummy	0.002	0.042	0.012	0.010	0.069	0.038
	(0.05)	(1.00)	(0.46)	(0.39)	(0.81)	(0.55)
Same State Dummy	–0.027	0.016	0.039	0.021	0.177*	0.121
	(–0.63)	(0.47)	(1.32)	(0.96)	(1.71)	(1.48)
Toehold Dummy	0.004	0.050	–0.059	–0.028	0.042	0.127
	(0.02)	(0.22)	(–0.85)	(–0.40)	(0.22)	(0.61)
Poison Pill Dummy	–0.047	–0.054	–0.133	–0.044	–0.004	0.199
	(–0.34)	(–0.32)	(–1.28)	(–0.34)	(–0.01)	(0.36)
Tender Offer Dummy	0.005	0.021	–0.025	0.015	0.126	0.207**
	(0.10)	(0.47)	(–1.10)	(0.68)	(1.51)	(2.55)
Merger of Equals Dummy	–0.179***	–0.168**	–0.139**	–0.141**	–0.905***	–0.931***
	(–3.17)	(–2.57)	(–2.17)	(–2.55)	(–2.67)	(–2.74)
High Tech Dummy	0.041	–0.032	–0.189***	–0.092***	–0.689***	–0.387***
	(0.94)	(–0.95)	(–4.66)	(–2.70)	(–5.12)	(–3.33)
Target Term. Fee Dummy	0.028	–0.023	–0.010	0.041*	–0.067	0.107
	(0.62)	(–0.41)	(–0.43)	(1.74)	(–0.87)	(1.13)
Pre-Competition Dummy	–0.017	–0.088	0.098	0.111*	0.316	0.442*
	(–0.36)	(–1.06)	(1.59)	(1.82)	(1.32)	(1.96)
Post-Competition Dummy	–0.013	0.029	–0.060	–0.042	–0.351	–0.354
	(–0.17)	(0.32)	(–1.11)	(–0.73)	(–1.21)	(–1.15)
Intercept	0.700***	0.659***	–0.039	0.040	–0.055	0.950***
	(7.12)	(7.99)	(–0.41)	(0.49)	(–0.19)	(3.60)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	No	Yes	No	Yes	No	Yes
Adj./ Pseudo R-sqr.	0.047	0.095	0.066	0.126	0.053	0.114
Num. of obs.	1569	1569	1569	1569	1569	1545

Table 12: Interlocking Directors' Effect on All Stock Payment, Post-Bid Competition, and Deal Success

This table presents the coefficient estimates of the probit regressions where the dependent variables are all stock payment, post-bid competition, and deal success, respectively for each set of columns. The control variables are target and acquirer size and book to market ratios; relative size; and all cash, hostile, same industry, same state, toehold, poison pill, tender offer, merger of equals, high tech, target termination fee, pre-bid and post-bid competition dummies. In each regression, either year or year and industry dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	All Stock Payment		Post-Bid Competition		Deal Success	
Interlocking Dummy	0.220	0.389**	0.243	0.268	–0.061	–0.006
	(1.21)	(2.14)	(1.18)	(1.16)	(–0.24)	(–0.02)
Target Log Market Cap.	0.031	0.079	0.167***	0.181***	–0.256***	–0.257***
	(0.70)	(1.60)	(3.05)	(3.01)	(–4.28)	(–4.10)
Acq. Log Market Cap.	–0.104*	–0.121**	–0.096*	–0.097*	0.284***	0.278***
	(–1.93)	(–2.28)	(–1.87)	(–1.69)	(5.29)	(5.06)
Target Log Book to Market	–0.166***	–0.153**	0.157	0.265*	0.042	0.015
	(–2.58)	(–2.33)	(1.25)	(1.86)	(0.44)	(0.17)
Acq. Log Book to Market	–0.344***	–0.329***	0.025	0.004	0.133*	0.070
	(–6.43)	(–5.89)	(0.23)	(0.04)	(1.68)	(1.00)
Relative Size	0.048	0.132*	0.069	0.164	–0.113	–0.088
	(0.70)	(1.88)	(0.81)	(1.41)	(–1.25)	(–0.91)
All Cash Dummy			0.410***	0.433***	–0.119	–0.060
			(3.12)	(2.66)	(–0.73)	(–0.33)
Hostile Dummy	–0.579***	–0.530***	0.903***	0.935***	–1.172***	–1.176***
	(–3.38)	(–2.86)	(5.18)	(5.02)	(–6.12)	(–6.07)
Same Industry Dummy	–0.032	–0.005	0.104	0.178	0.189*	0.279***
	(–0.39)	(–0.05)	(0.61)	(0.81)	(1.93)	(2.78)
Same State Dummy	0.108	0.005	0.025	0.181	0.127	0.035
	(1.16)	(0.04)	(0.17)	(1.10)	(1.52)	(0.37)
Toehold Dummy	–0.799***	–0.751***	–0.032	0.014	–0.274	–0.140
	(–3.83)	(–3.02)	(–0.14)	(0.05)	(–0.98)	(–0.46)
Poison Pill Dummy	–0.603*	–0.791***	–0.611	–0.820*	–0.019	–0.099
	(–1.95)	(–2.63)	(–1.53)	(–1.87)	(–0.06)	(–0.28)

Table continues to next page.

	All Stock Payment		Post-Bid Competition		Deal Success	
Tender Offer Dummy	–1.724***	–1.675***	–0.076	–0.069	0.260*	0.240
	(–12.42)	(–10.98)	(–0.46)	(–0.38)	(1.84)	(1.53)
Merger of Equals Dummy	0.757**	0.891**	0.487**	0.260	–0.125	–0.104
	(2.39)	(2.55)	(2.08)	(1.14)	(–0.66)	(–0.52)
High Tech Dummy	0.089	0.059	–0.287	–0.347	0.422***	0.539***
	(0.39)	(0.23)	(–0.83)	(–0.88)	(2.61)	(3.53)
Target Term. Fee Dummy	–0.240	–0.043	0.067	0.059	0.744***	0.971***
	(–1.63)	(–0.39)	(0.48)	(0.37)	(5.11)	(7.68)
Pre-Bid Competition Dummy	–0.232	–0.227	0.603***	0.396*	–0.440**	–0.578***
	(–0.99)	(–0.88)	(3.19)	(1.77)	(–2.13)	(–2.71)
Post-Bid Competition Dummy	–0.085	–0.078			–1.355***	–1.380***
	(–0.51)	(–0.42)			(–6.23)	(–5.84)
Intercept	0.690***	0.659**	–2.124***	–1.023***	0.736**	1.158***
	(3.38)	(2.43)	(–7.64)	(–2.83)	(2.56)	(3.17)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	No	Yes	No	Yes	No	Yes
Pseudo R-sqr.	0.217	0.273	0.176	0.244	0.321	0.385
Num. of obs.	1823	1787	1726	1344	1823	1734

Table 13: Accounting Performance of Non-Selected Interlocking Firms with Respect to Their Peers

This table analyzes the performance of the non-selected interlocking firms. The sample consists of deals where the selected target is non-interlocking whereas there are potential interlocking targets. I first define *change in ROA* of the firms as return on assets (ROA) averaged over the three years following the deal announcement (DA) divided by its average over the three years prior to the DA. Next, I define a control firm for each non-selected potential interlocking firm as another potential target firm in the same deal that is non-selected but non-interlocking, and that has the closest value of prior three year ROA to that of the non-selected interlocking firm. The variable of interest is the *adjusted change in ROA*, which is the change in ROA, adjusted by subtracting that of the control firm. Variables are defined in Appendix 2. I report the mean and median of the variables. The p-values in parenthesis are obtained from t-tests and signed rank tests which are used to determine whether the statistics are significantly different from zero. The symbols ***, **, and * denote statistical significance of variables at the 1%, 5%, and 10% levels, respectively.

	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Pre-DA Avg. ROA	-0.0876	0.1060***	-0.0100	0.0789**	0.0986***	0.1230***	0.0898***	0.1394***
	(0.57)	(0.00)	(0.86)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Post-DA Avg. ROA	0.0356	0.0719***	0.0019	0.0555*	0.0848***	0.1085***	0.0625***	0.0852***
	(0.11)	(0.00)	(0.96)	(0.07)	(0.00)	(0.00)	(0.00)	(0.00)
Change in ROA	-0.2695*	-0.3050***	-0.2961	-0.3611**	-0.1194	-0.0932***	-0.4217***	-0.3246***
	(0.08)	(0.00)	(0.22)	(0.02)	(0.24)	(0.01)	(0.00)	(0.00)
Adjusted Change in ROA	-0.4049*	-0.1630***	-1.1630	-0.3029**	-0.7042	-0.0422	0.0977	-0.0018
	(0.08)	(0.00)	(0.13)	(0.01)	(0.41)	(0.75)	(0.51)	(0.90)
Num. of obs.	111	111	64	64	91	91	58	58

Table 14: Cumulative Abnormal Returns for Non-Selected Interlocking and Non-Interlocking Firms

This table presents the descriptive statistics for cumulative abnormal returns for potential target firms for different event windows $[t_1,t_2]$. I obtain the estimates of the market model for each firm by using 200 trading days of return data, beginning 220 days before and ending 21 days before the deal announcement. I use as the market return the CRSP equal weighted return, and sum the daily abnormal returns to get the cumulative abnormal return (CAR) from day t_1 before the announcement date to day t_2 after the announcement date. I report the mean, median and difference tests. The numbers in the test of difference columns denote p-values. The number of firms (N), out of which 170 are interlocking, is stated below each line.

	Interlocking Firms (A)		Non-Interlocking Firms (B)		Test of Difference (A-B)	
	Mean	Median	Mean	Median	t-test	Wilcoxon z-test
CAR[-20,1]	0.0059	0.0076	0.0001	-0.0013	0.73	0.49
N=5,619						
CAR[-1,1]	-0.0016	0.0021	-0.0001	-0.0022	0.82	0.47
N=5,619						
CAR[-5,5]	-0.0050	-0.0034	-0.0021	-0.0035	0.81	0.87
N=5,613						
CAR[-10,10]	-0.0163	-0.0211	-0.0015	-0.0032	0.38	0.40
N=5,603						
CAR[-20,20]	-0.0066	-0.0047	0.0000	0.0078	0.82	0.94
N=5,580						

Table 15: Regression Results for Portfolios of Non-Selected Interlocking and Non-Interlocking Firms

This table reports OLS coefficient estimates when excess returns of the portfolios of non-selected potential target firms are regressed on four factors: market (MRKTRF), size (SMB), and book to market (HML) factors proposed by Fama and French (1993), and Carhart (1997) momentum factor (UMD). The sample period starts in January 1996 and ends in December 2006, 2007, and 2008 for one, two and three years holding periods, respectively. Portfolio formation is described in the text. Standard errors are white heteroscedasticity-consistent. The t-statistics are reported in parentheses. ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

Portfolios	Intercept	t-stat	MRKTRF	t-stat	SML	t-stat	HML	t-stat	UMD	t-stat	R-squared	N
One Year Holding Period												
Interlocking	0.0109*	(1.83)	1.1736***	(6.59)	0.9213***	(4.81)	-0.2563	(-1.17)	-0.4044***	(-3.99)	0.655	132
Non-Interlocking	0.0120***	(5.31)	1.0980***	(18.61)	0.9192***	(14.55)	-0.2491***	(-3.07)	-0.4257***	(-10.62)	0.933	132
Control	0.0143***	(3.00)	1.0915***	(8.77)	0.7902***	(6.48)	-0.1443	(-0.81)	-0.6279***	(-10.85)	0.764	132
Two Years Holding Period												
Interlocking	0.0073	(1.42)	1.3769***	(8.17)	0.9548***	(6.26)	0.0369	(0.22)	-0.3279***	(-3.11)	0.688	144
Non-Interlocking	0.0136***	(6.58)	1.0779***	(18.51)	0.9574***	(13.44)	-0.2298***	(-2.90)	-0.3796***	(-11.32)	0.927	144
Control	0.0146***	(3.60)	1.1160***	(11.41)	0.8732***	(8.09)	-0.0231	(-0.14)	-0.4974***	(-6.86)	0.763	144
Three Years Holding Period												
Interlocking	0.0065	(1.58)	1.0918***	(8.03)	0.7881***	(7.56)	-0.0651	(-0.46)	-0.3347***	(-5.62)	0.717	156
Non-Interlocking	0.0112***	(5.84)	1.0845***	(21.31)	0.9453***	(14.36)	-0.1467**	(-2.20)	-0.3706	(-9.14)	0.930	156
Control	0.0118***	(3.30)	0.9855***	(12.54)	0.7605***	(7.41)	-0.0496	(-0.42)	-0.4589***	(-6.82)	0.764	156

Table 16: Testing the Endogeneity Concerns: Alternative Sets of Potential Targets

This table presents the coefficient estimates of the probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise. For each announced deal, I create a set of potential targets who belong to the same two-digit SIC code industry as the actual target and has similar board size or board independence or degree centrality or return on assets; and run the regressions for this sample. The variable of interest is the *interlocking dummy*. The control variables are target size; return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership; industry Herfindahl index; and same state dummy. In each regression, either year and industry or deal dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	2-Digit SIC Code		2-Digit SIC Code		2-Digit SIC Code		2-Digit SIC Code	
	10% Board Size Band		10% Board Indep. Band		10% Degree Cent. Band		10% ROA Band	
Interlocking Dummy	0.977***	1.086***	0.922***	1.031***	1.083***	1.212***	0.874***	1.021***
	(11.12)	(8.96)	(11.77)	(11.07)	(10.42)	(8.83)	(5.95)	(5.42)
Return on Equity	–0.021	–0.034*	–0.018	–0.043***	–0.110***	–0.074***		
	(–1.10)	(–1.67)	(–1.15)	(–2.64)	(–4.47)	(–2.58)		
Log Book to Market	0.018	0.016	0.014	0.021	0.084***	0.036*	–0.016	–0.035
	(0.88)	(0.86)	(0.92)	(1.41)	(3.85)	(1.75)	(–0.47)	(–0.93)
Log Market Cap.	–0.044***	–0.060***	–0.055***	–0.058***	0.042**	–0.050***	–0.052***	–0.057***
	(–3.98)	(–5.79)	(–5.88)	(–6.82)	(1.97)	(–3.67)	(–3.41)	(–4.22)
Growth of Sales	–0.032**	2.077***	–0.016	–1.458***	–0.003	2.393***	0.056	1.328***
	(–1.98)	(15.79)	(–0.97)	(–13.06)	(–0.10)	(13.19)	(1.04)	(5.74)
Price to Earnings	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000
	(–1.14)	(–1.12)	(–1.01)	(–1.03)	(–0.85)	(–0.43)	(–0.62)	(–0.49)
Debt to Equity	–0.000	–0.004	–0.002	–0.008	0.004	–0.003	0.017	0.008
	(–0.03)	(–0.29)	(–0.16)	(–0.57)	(0.54)	(–0.21)	(1.58)	(0.62)

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	2-Digit SIC Code		2-Digit SIC Code		2-Digit SIC Code		2-Digit SIC Code	
	10% Board Size Band		10% Board Indep. Band		10% Degree Cent. Band		10% ROA Band	
Volatility	–3.275	–4.565	–3.203	–6.140	–1.339	–7.654	40.399***	12.155
	(–0.75)	(–0.88)	(–0.72)	(–1.39)	(–0.23)	(–1.41)	(3.25)	(0.86)
Lagged Return	0.157***	0.192***	0.158***	0.201***	0.204***	0.255***	0.334***	0.468***
	(3.50)	(3.30)	(3.84)	(3.53)	(3.38)	(3.44)	(4.56)	(4.22)
Institutional Ownership	0.616***	0.720***	0.574***	0.640***	0.661***	0.672***	0.652***	0.710***
	(10.36)	(10.48)	(11.38)	(10.76)	(11.55)	(9.59)	(11.92)	(10.81)
Herfindahl Index	–0.326***	–0.436***	–0.358***	–0.489***	–0.368***	–0.549***	–0.457***	–0.664***
	(–3.03)	(–3.41)	(–3.78)	(–3.78)	(–4.30)	(–3.69)	(–3.55)	(–3.31)
Same State Dummy	0.708***	0.906***	0.703***	0.864***	0.766***	0.970***	0.935***	1.160***
	(4.40)	(4.74)	(4.73)	(4.79)	(4.80)	(5.42)	(5.47)	(6.49)
Intercept	–0.700***	–1.864***	–1.079***	–2.050***	–1.017***	–1.797***	–0.455***	–1.725***
	(–14.59)	(–31.42)	(–18.56)	(–45.65)	(–7.99)	(–33.38)	(–4.52)	(–19.37)
Year Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Industry Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Deal Dummy	No	Yes	No	Yes	No	Yes	No	Yes
Pseudo R-sqr.	0.129	0.180	0.129	0.076	0.210	0.270	0.185	0.243
Num. of obs.	75493	75493	111267	111176	110701	110701	50196	50196

Table 17: Testing the Alternative Sample: Excluding Deals with Toeholds

This table presents the coefficient estimates of the probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise. For each announced deal, I create a set of potential targets who belong to the same two-digit SIC code industry as the actual target and has similar size (market capitalization). The variable of interest is the *interlocking dummy*, and its interaction with one of the information asymmetry proxies. The control variables are target return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership; industry Herfindahl index; same state and deal dummies. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Interlocking Dummy (a)	0.838***	0.761***	0.786***	0.345	0.678***	0.743***	0.971***	1.019***
	(5.46)	(4.48)	(4.82)	(1.00)	(3.04)	(5.06)	(5.53)	(3.32)
Return on Equity (b)	0.000	0.009	0.002	0.007	–0.000	–0.001	–0.000	–0.016
	(0.01)	(0.32)	(0.10)	(0.23)	(–0.01)	(–0.02)	(–0.00)	(–0.71)
(a) × (b)		–0.481*						
		(–1.68)						
Small Size Dummy (c)			–0.278***					
			(–3.76)					
(a) × (c)			0.421					
			(1.58)					
Standard Deviation (d)				0.071				
				(0.26)				
(a) × (d)				2.370*				
				(1.73)				
(a) × Diversifying Dummy					0.414			
					(1.40)			
Log Book to Market	0.005	0.006	0.007	–0.027	0.005	0.004	0.005	–0.004
	(0.25)	(0.26)	(0.33)	(–1.06)	(0.26)	(0.20)	(0.25)	(–0.17)
Growth of Sales	1.361***	1.252***	1.328***	0.797***	1.584***	1.451***	1.475***	1.458***
	(9.08)	(6.39)	(8.73)	(2.67)	(8.31)	(8.67)	(8.44)	(5.52)

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) × Acquirer Debt to Equity						0.223		
						(1.61)		
(a) × Acq. Cash over Net Assets							–0.368*	
							(–1.91)	
(a) × Acq. Accounting Liquidity								–0.427
								(–0.63)
Price to Earnings	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.001*
	(–0.92)	(–0.92)	(–0.90)	(–0.43)	(–0.92)	(–0.92)	(–0.92)	(–1.76)
Debt to Equity	0.003	0.002	0.003	0.009	0.003	0.003	0.003	–0.006
	(0.25)	(0.19)	(0.29)	(0.80)	(0.22)	(0.26)	(0.27)	(–0.36)
Volatility	12.103**	12.301**	12.425**		12.058**	11.327*	12.289**	16.151***
	(2.06)	(2.09)	(2.12)		(2.05)	(1.92)	(2.09)	(2.72)
Lagged Return	0.204***	0.204***	0.205***	0.247***	0.204***	0.204***	0.205***	0.148***
	(3.00)	(3.01)	(3.01)	(3.50)	(3.00)	(3.00)	(3.00)	(3.69)
Institutional Ownership	0.916***	0.917***	0.911***	1.044***	0.917***	0.918***	0.917***	1.013***
	(10.29)	(10.32)	(10.28)	(9.16)	(10.29)	(10.68)	(10.27)	(9.50)
Herfindahl Index	–0.568***	–0.568***	–0.560***	–0.622***	–0.568***	–0.555***	–0.569***	–0.400***
	(–3.74)	(–3.72)	(–3.69)	(–3.95)	(–3.74)	(–3.61)	(–3.74)	(–4.32)
Same State Dummy	1.018***	1.019***	1.019***	1.111***	1.018***	1.022***	1.018***	0.697***
	(4.92)	(4.92)	(4.90)	(5.01)	(4.91)	(4.95)	(4.91)	(9.05)
Intercept	–1.946***	–1.928***	–1.937***	–1.977***	–1.984***	–1.965***	–1.966***	–2.056***
	(–26.96)	(–27.69)	(–26.70)	(–21.65)	(–27.65)	(–27.21)	(–26.32)	(–19.84)
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-sqr.	0.185	0.186	0.186	0.195	0.186	0.186	0.186	0.156
Num. of obs.	58745	58745	58745	42371	58745	58559	58745	33801

Table 18: Testing the Alternative Explanation: Network Centrality

This table presents the coefficient estimates of the probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise. For each announced deal, I create a set of potential targets who belong to the same two-digit (or three-digit) SIC code industry as the actual target and has similar size (market capitalization) or book to market (BM) or debt to equity ratio (DE); and run the regressions for this sample. The variables of interest are the *interlocking dummy*, the *busy board dummy*, which equals to 1 if the majority of target board's outside directors hold three or more directorships, and 0 otherwise; and network centrality indices: *degree centrality*, *average directorship*, and *interlock count*. The control variables, whose coefficients are suppressed for brevity, are target size; return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership; industry Herfindahl index; and same state dummy. In each regression, either year and industry or deal dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
				Panel A: Controlling for Busy Boards				
Interlocking Dummy	0.947***	1.102***	0.873***	1.078***	1.059***	1.241***	0.898***	1.086***
	(10.55)	(8.73)	(7.19)	(6.01)	(12.33)	(10.74)	(7.11)	(6.15)
Busy Board Dummy	0.016	–0.005	0.018	0.003	–0.021	–0.014	–0.030	–0.027
	(0.76)	(–0.16)	(0.57)	(0.06)	(–0.60)	(–0.38)	(–0.80)	(–0.80)
Pseudo R-sqr.	0.149	0.189	0.177	0.174	0.158	0.201	0.157	0.290

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	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
				Panel B: Controlling for Degree Centrality				
Interlocking Dummy	0.915***	1.085***	0.847***	1.061***	1.056***	1.240***	0.888***	1.077***
	(10.32)	(8.90)	(7.08)	(6.02)	(12.41)	(10.81)	(7.18)	(6.20)
Degree Centrality	0.602***	0.366**	0.605***	0.486**	0.000	–0.014	0.222	0.173
	(3.10)	(2.15)	(2.77)	(2.10)	(0.00)	(–0.09)	(1.20)	(0.91)
Pseudo R-sqr.	0.150	0.189	0.178	0.174	0.158	0.201	0.158	0.290
				Panel C: Controlling for Average Directorship				
Interlocking Dummy	0.930***	1.091***	0.860***	1.070***	1.055***	1.236***	0.893***	1.075***
	(10.61)	(8.89)	(7.23)	(6.04)	(12.19)	(10.66)	(7.22)	(6.17)
Average Directorship	0.051**	0.036	0.045*	0.038	0.003	0.014	0.014	0.032
	(2.16)	(1.40)	(1.90)	(1.31)	(0.15)	(0.49)	(0.51)	(1.02)
Pseudo R-sqr.	0.149	0.189	0.177	0.174	0.158	0.201	0.157	0.290
				Panel D: Controlling for Interlock Count				
Interlocking Dummy	0.917***	1.086***	0.848***	1.063***	1.054***	1.238***	0.888***	1.077***
	(10.37)	(8.89)	(7.06)	(5.99)	(12.31)	(10.74)	(7.17)	(6.17)
Interlock Count	0.010***	0.007**	0.011***	0.008**	0.001	0.001	0.004	0.003
	(3.02)	(2.11)	(2.84)	(2.27)	(0.37)	(0.20)	(1.25)	(0.93)
Pseudo R-sqr.	0.150	0.189	0.178	0.174	0.158	0.201	0.158	0.290
Year Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Industry Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Deal Dummy	No	Yes	No	Yes	No	Yes	No	Yes
Num. of obs.	60072	60072	32943	32920	57829	57829	57252	57252

Table 19: Testing the Alternative Explanation: Entrenchment

This table presents the coefficient estimates of the probit regression where the dependent variable is a dummy taking value 1 if there is a bid for the firm, and 0 otherwise. For each announced deal, I create a set of potential targets who belong to the same two-digit (or three-digit) SIC code industry as the actual target and has similar size (market capitalization) or book to market (BM) or debt to equity ratio (DE); and run the regressions for this sample. The variables of interest are the interaction between the *interlocking dummy* and the *high entrenchment dummy*, which equals to 1 if the target entrenchment index (a corporate governance index based on 6 provisions taken from Bebchuk et al. (2009) is greater than or equal to 2, and 0 otherwise; and corporate governance indices: *governance index*, *entrenchment index*, and *classified board dummy*. The control variables, whose coefficients are suppressed for brevity, are target size; return on equity; growth of sales; book to market, price to earnings, and debt to equity ratios; lagged return and volatility; institutional ownership; industry Herfindahl index; and same state dummy. In each regression, either year and industry or deal dummies are included. Variables are defined in Appendix 2. The t-statistics in parentheses are estimated using standard errors adjusted for the industry clustering, with industry being defined as the two-digit SIC code. The symbols ***, **, and * denote statistical significance of coefficients at the 1%, 5%, and 10% levels, respectively.

	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
				Panel A: Highly Entrenched Targets				
Interlocking Dummy (a)	0.714***	0.715***	0.687**	0.733**	1.205***	1.339***	0.661***	0.821***
	(3.57)	(2.88)	(2.56)	(2.33)	(5.54)	(4.29)	(3.47)	(3.14)
High Ent. Dummy (b)	0.041	0.057	0.000	–0.063	0.068	0.084	0.075	–0.001
	(0.61)	(0.78)	(0.01)	(–0.61)	(1.01)	(0.99)	(0.99)	(–0.01)
(a) × (b)	–0.415	–0.286	–0.393	–0.082	–0.776	–0.999	–0.400	–0.112
	(–0.78)	(–0.40)	(–0.51)	(–0.08)	(–1.57)	(–1.57)	(–0.78)	(–0.16)
Pseudo R-sqr.	0.115	0.171	0.125	0.214	0.155	0.202	0.166	0.266

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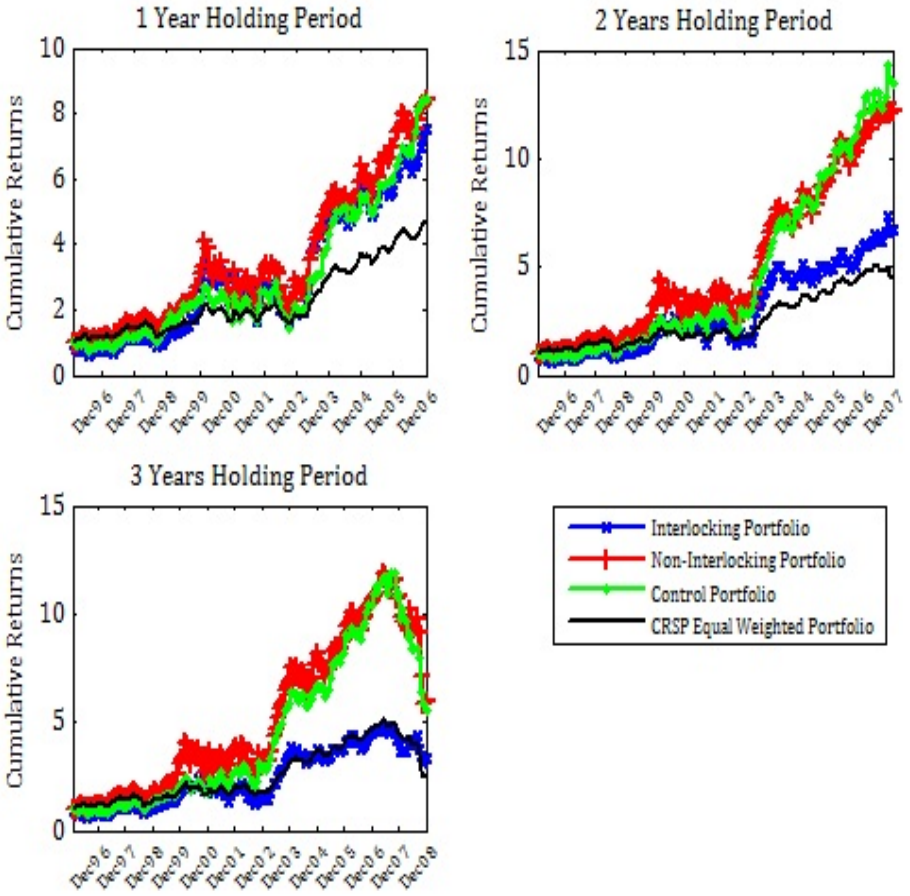
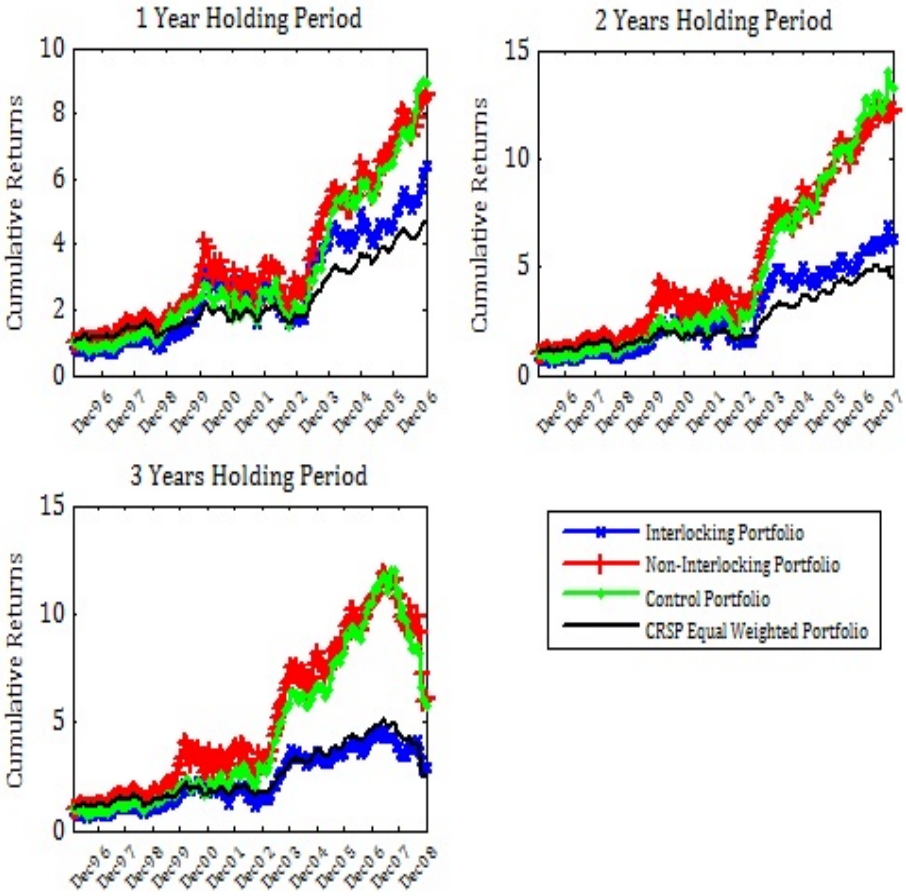
	2-Digit SIC Code 30% Size Band		3-Digit SIC Code 30% Size Band		2-Digit SIC Code 10% BM Band		2-Digit SIC Code 10% DE Band	
				Panel B: Controlling for Governance Index				
Interlocking Dummy	0.588***	0.629***	0.582**	0.717**	0.899***	0.932***	0.557***	0.787***
	(3.60)	(2.82)	(2.34)	(1.98)	(6.20)	(4.85)	(3.32)	(3.10)
Governance Index	0.019**	0.021*	0.025**	0.017	0.022**	0.030**	0.030*	0.022
	(1.97)	(1.69)	(1.99)	(0.94)	(2.21)	(2.36)	(1.96)	(1.27)
Pseudo R-sqr.	0.116	0.171	0.126	0.214	0.155	0.202	0.167	0.267
				Panel C: Controlling for Entrenchment Index				
Interlocking Dummy	0.593***	0.628***	0.584**	0.713*	0.908***	0.944***	0.556***	0.786***
	(3.63)	(2.80)	(2.33)	(1.96)	(6.34)	(5.00)	(3.42)	(3.13)
Entrenchment Index	0.045*	0.057**	0.043	0.026	0.052**	0.065**	0.068**	0.047
	(1.85)	(2.06)	(1.53)	(0.67)	(2.10)	(2.22)	(2.13)	(1.34)
Pseudo R-sqr.	0.116	0.172	0.126	0.213	0.155	0.202	0.168	0.267
				Panel D: Controlling for Classified Boards				
Interlocking Dummy	0.583***	0.622***	0.580**	0.715**	0.903***	0.941***	0.542***	0.785***
	(3.51)	(2.74)	(2.32)	(1.97)	(6.32)	(4.91)	(3.10)	(3.04)
Classified Board Dummy	0.028	0.077	0.060	0.066	0.054	0.053	–0.006	–0.076
	(0.44)	(1.19)	(0.72)	(0.68)	(0.90)	(0.74)	(–0.10)	(–1.00)
Pseudo R-sqr.	0.115	0.171	0.125	0.214	0.154	0.200	0.165	0.266
Year Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Industry Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Deal Dummy	No	Yes	No	Yes	No	Yes	No	Yes
Num. of obs.	4879	4879	2276	2276	4182	4182	3737	3737

Figure 1: Cumulative Returns of the Equal Weighted Interlocking and Non-Interlocking Portfolios



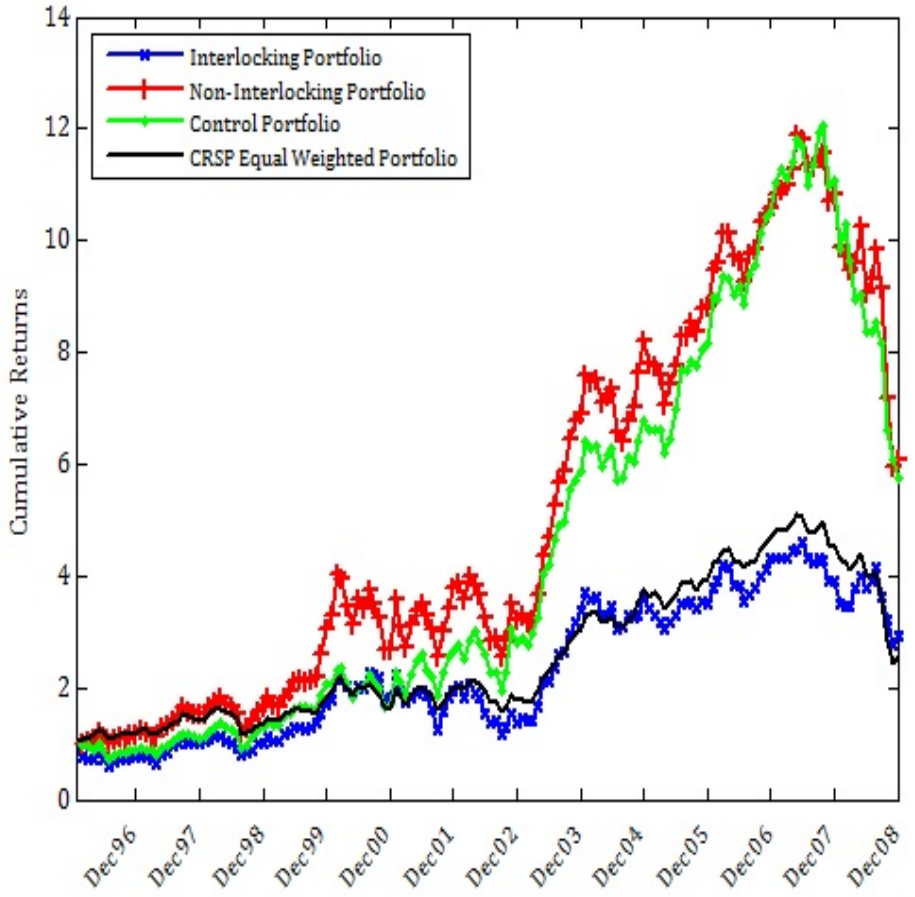
This figure presents the cumulative returns of the interlocking and non-interlocking portfolios. The sample period starts in January 1996 and ends in December 2006, 2007, and 2008 for one, two and three years holding periods, respectively. Portfolio formation is described in the text.

Figure 2: Cumulative Returns of the Equal Weighted Interlocking and Non-Interlocking Portfolios - Starting from the Two Days after the Deal Announcement



This figure presents the cumulative returns of the interlocking and non-interlocking portfolios. The sample period starts in January 1996 and ends in December 2006, 2007, and 2008 for one, two and three years holding periods, respectively. Portfolio formation is described in the text.

Figure 3: Cumulative Returns of the Equal Weighted Portfolios with 3 Years Holding Period - Starting from the Two Days after the Deal Announcement



This figure presents the cumulative returns of the interlocking and non-interlocking portfolios with three years holding period. The sample period is January 1996-December 2008. Portfolio formation is described in the text.