# Advisor-hedge fund connections, information flows and deal outcomes in mergers and acquisitions

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#### Abstract

This paper examines the impact of investment banks' prime brokerage connections to hedge funds on the choice of an advisor and the deal outcome in M&As. Acquirers are more likely to choose advisors connected to hedge funds that hold equity in the target before the deal announcement. Such connections increase the likelihood of deal completion and decrease premiums and target abnormal returns, especially when target firms are characterised by a high degree of information asymmetry. This suggests an 'indirect toehold' mechanism of information transmission.

*Keywords:* Choice of advisor; hedge fund holdings; indirect toehold; information advantage; mergers and acquisitions.

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# 1 Introduction

As a pre-cursor to economic resource re-allocation, and a catalyst for wealth creation and redistribution between relevant stakeholders, mergers and acquisitions (M&As) rank among the most significant corporate events. The Institute for Mergers, Acquisitions, and Alliances (IMAA)<sup>1</sup> estimates that at the peak of the 2018 merger wave, the transaction value of US M&As totalled \$2,431 billion. A common characteristic of these M&A transactions is the involvement of financial advisors, normally investment banks, with over 84% (by transaction value) of deals we investigate facilitated by an advisory firm. The input of advisors is especially important when executing complex deals characterised by high levels of information asymmetry (Servaes and Zenner, 1996). At the same time, advisors may exploit information gained through the advisory process for their own benefit (Bodnaruk et al., 2009), as well as share valuable firm-specific information with their other clients, such as hedge funds (Kumar et al., 2020).

Our paper examines the information flows between different parties within this network of connections involved in M&As, analysing the potential effects of any information transmission on deal outcomes. Several key players merit attention. (1) A bidder: a firm that intends to acquire a target and may already own an initial equity stake in the target. (2) An advisor: an investment bank chosen by the bidder to facilitate the deal. This bank may also serve as a prime broker to one or more hedge funds. (3) A target: the firm that is to be acquired through a completed deal. (4) Hedge funds: that may own equity in either the target and/or the bidding firm, and may be connected to the advisor through a prime-brokerage relationship. Information flows within such a network are complex and multi-directional, and are discussed in detail in Section 2.

This study examines two potential channels of information transmission. In the first,

<sup>&</sup>lt;sup>1</sup>The data is available at https://imaa-institute.org/mergers-and-acquisitions-statistics/united-states-ma-statistics/

advisors may use the equity holdings of connected hedge funds in the target firm as an 'indirect toehold'. This toehold may enable advisors to obtain additional information about the target and use it to help the bidder to reduce information asymmetry (henceforth, IA) and secure improved terms on the deal. The second channel involves connected hedge funds securing an 'information advantage' from their connected advisor concerning the deal's prospects, and initiating appropriate adjustments in their strategy when trading bidder or target's equity prior to any M&A announcement.

Using a sample of 931 US mergers of public companies with hedge fund holdings in the target firm between 2000 to 2019, we find that acquirers are more likely to select an investment bank as their deal advisor if the bank's connected hedge funds own equity in the target firm. Two channels can contribute to this result. Having chosen a particular target, the acquirer may be searching for a connected advisor to facilitate the deal. The estimated probability for the average investment bank in our sample to be chosen as a deal's advisor increases from 10% if it does not have connected hedge funds to 15% if it does. Alternatively, the acquirer may first hire an advisor, who then recommends a firm in which a connected hedge fund holds equity as a target. In our sample the probability that an average firm is chosen as a target increases from 18% to 37% if the firm's equity is held by a hedge fund connected to the advisor.<sup>2</sup>

Our analysis reveals no evidence that advisors share their private information concerning impending M&A deals with their connected funds upon which hedge funds act. Connected hedge funds undertake no significant changes in their equity holdings of either target or acquirer firms before the deal announcement when compared to unconnected funds.

At the same time, deals where connected funds own equity in target firms exhibit a higher likelihood of deal completion, and are associated with significantly lower premiums

 $<sup>^{2}</sup>$ There are also cases where the deals are initiated by target firms. In these deals, target firms hire their advisors and approach potential synergistic bidders. In this scenario, bidders face the same situation of choosing an advisor and may search for a connected advisor to facilitate the deal.

and lower target abnormal returns on the announcement date, especially for target firms that are characterized by a higher degree of IA. Several factors further amplify these effects. First, the effects are stronger if a high IA target is of minor importance in the connected fund's portfolio, that is: it represents a small share of holdings in a hedge fund portfolio, the hedge fund does not specialize in the target's industry, or the fund holds the target for only a short period of time. Second, the magnitude of the effects is higher when the relationship with the prime broker is of greater importance for hedge funds. This occurs when the prime broker is either the only prime broker the hedge fund company uses, or is a dominant prime broker, as well as when low flows constrain a hedge fund's funding. Third, the effects are amplified when the marginal value of information for a bidder is greater, namely when bidder and target come from different industries, there are multiple bidders in a deal, and the deal happens during a merger wave.

These findings suggest that a bidder may benefit from any value relevant information obtained through the advising investment bank and its connected hedge funds, thereby supporting the 'indirect toehold' hypothesis. These relationships appear to help the bidder to reduce IA and enhance its bargaining power.

In a broader context, our analysis contributes to the growing literature on the relationship between hedge funds and their prime brokers and the information flow channels between these institutions. Hedge funds sharing prime brokers exhibit a strong co-movement in returns attributable to information flowing from the common broker (Chung and Kang, 2016). Similarly, information regarding corporate client loans disseminates from prime brokers to hedge funds (Kumar et al., 2020). Hedge funds earn higher abnormal returns from IPO stocks when their prime brokers serve as IPO underwriters (Qian and Zhong, 2018). Prime brokerage relations also expose hedge funds to significant counterparty risk. The probability of contagion across hedge funds increases following adverse shocks to their prime broker's share price (Boyson et al., 2010). Hedge funds using Lehman Brothers as their prime broker experience a decline in funding liquidity subsequent to its bankruptcy in 2008 (Aragon and Strahan, 2012). A liquidity shock to a prime broker can be transmitted to connected funds and result in a reduction in credit to hedge funds (Kruttli et al.). We contribute to this literature by highlighting the existence of a reverse direction of information flow, namely from hedge funds to their prime brokers.

Our analysis also informs discussions concerning the role of M&A advisors. Studies contend that investment bank advisors may facilitate the successful completion of complex deals characterized by significant informational asymmetries and also reduce transaction costs (Servaes and Zenner, 1996). However, the relevant empirical evidence is mixed. While investment bank involvement may lead to larger shareholder wealth gains (Kale et al., 2003), enhanced M&A returns (Bao and Edmans, 2011; Golubov et al., 2012), and a greater probability of deal completion (Hunter and Jagtiani, 2003), other studies find no association between an advisor's quality and M&A outcomes (Rau, 2000; Hunter and Jagtiani, 2003; Ismail, 2010). At the same time, certain evidence suggests that the type of advisor impacts the terms of the M&A deals. For example, if a target's own bank acts as the advisor, it fulfils 'a certification role' for the target's quality, which leads to enhanced target abnormal returns (Allen et al., 2004). Top-tier advisors can enhance outcomes by identifying more synergistic combination, leading to a larger share of synergies to accrue to bidders (Kale et al., 2003; Golubov et al., 2012). Complex deals are more likely to use boutique advisors, and acquirers hiring such advisors tend to pay reduced premiums (Song et al., 2013). Several other factors are found to influence the choice of advisor. These include the prior performance of the advisor and changes in the advisors' market value. (Sibilkov and McConnell, 2014), prior client relationships, the reputation of the advisor, and deal complexity (Francis et al., 2014), advisor's industry expertise, and a firm's concerns about information leakage to industry rivals (Chang et al., 2016a). Forte et al. (2010) focus on the target's choice of advisor and show that the probability of hiring a bank depends on the intensity of the previous banking relationship, the reputation of the bidder's advisor, and the complexity of the deal. Our findings contribute to this literature, indicating that an advisor's connections to hedge funds with holdings in the target is a significant determinant of the choice of advisor by acquirers.

Our study also contributes to the literature on the impact of IA in acquisitions and the division of any resulting gains between firms. Acquirer returns are significantly higher in stock-swap acquisitions of difficult-to-value targets (Officer et al., 2009). Targets characterised by greater IA tend to receive larger bid premiums from the acquirers, and the acquirers' investors respond more positively to the acquisition of opaque targets (Cheng et al., 2016). Acquirers strategically exploit their superior bargaining power, are more likely to offer cash payments, and earn a larger fraction of total M&A gains if the target is characterized by higher IA (Luypaert and Van Caneghem, 2017). Acquirers' gains increase if they employ financial advisors in private offers, whereas the opposite is true for public deals (Leledakis et al., 2021) and when they employ targets' ex-advisors (Chang et al., 2016b). We show that advisors' connections to hedge funds that own equity in target firms are also a potential source of information for acquirers. Such an indirect toehold seems to help the bidder to collect more information about the target, reduce IA, and enhance their bargaining power. This result complements the findings in Bodnaruk et al. (2009) that investment banks profitably exploit information gained as advisors by taking stakes in target firms before the deal announcement. Their stakes are positively related to bid prospects and to the size of any premium paid for targets. Hence, the authors implicitly document information flowing from the acquirers to the advisors, which the latter use for their benefit. Our findings suggest that information also flows in the reverse direction from the targets to hedge funds (through fund's direct equity holdings in the target), then to the investment banks (through their prime-brokerage relations with hedge funds), and finally (and beneficially) to bidders (through their advisory relationship with these investment banks).

Our paper is also related to the role of toeholds, defined as pre-bid ownership of target

shares, in acquisitions. Even though target firms control both the number of bidders and the flow of information, granting access to confidential information during the due diligence period (Boone and Mulherin, 2009; Eaton et al., 2022), some information remains inaccessible to bidders. Bidders strategically use toeholds to generate an informational advantage over rivals, positively enhancing their profits. Betton and Eckbo (2000) and Bris (2002) find that the probability of being taken over, the takeover premium, and pre-bid increases in the target's stock price are negatively related to toehold size. In contrast, the post-announcement rise in the target's stock price is positively related to toehold size. Povel and Sertsios (2014) provide evidence that potential acquirers of a target use toeholds to improve their information about possible synergies with the target, and this strategy is more beneficial when the target is opaque. Our results indicate that advisor connections to hedge funds that hold targets appear to function as an 'indirect toehold', and similarly help to create an informational advantage for bidders.

Finally, we extend the literature on the role of hedge funds in the M&A process. Activist interventions by hedge funds substantially increase the probability of a takeover offer and enhance shareholder value (Boyson et al., 2017). They also improve a firm's M&A decisions and investors respond favourably to such post-activism acquisitions (Wu and Chung, 2022). In contrast, targets characterized by agency problems and facing threats of investor coordination often engage in hostile resistance, which leads to adverse outcomes unless hedge funds provide resistance (Boyson and Pichler, 2019). As for non-activist hedge funds, Gao et al. (2018) find evidence that pre-transaction hedge-fund holdings in the target firm increase the proportion of cash payment while having no effect on the deal premium. Dai et al. (2017) show that hedge funds use non-public information to take long positions in M&A target stocks and short positions in acquirer stocks before M&A announcements, and their stakes in targets are positively related to takeover premiums. Our paper highlights how hedge funds may potentially gather target-related private information through their holdings, and then transmit it to bidders via their prime brokerage connections to advisors.

## 2 Research Design: Information Flows in M&As

This section presents two scenarios relating to information flow patterns in M&As, and then explores how these patterns may influence the choice of an advisor, choice of a target, changes in hedge fund equity holdings, deal duration, deal completion, target premium, and abnormal returns. Note, these two scenarios are not mutually exclusive. Figure 1 illustrates the relevant directions of information flow between targets, hedge funds, advisors, and bidders in M&As. Initially, we consider potential information flows from targets to hedge funds (through their equity holdings in targets), then to advisors (through their prime-brokerage relations with hedge funds), and finally to acquirers. This transmission pathway constitutes our 'indirect toehold' scenario.

#### [Figure 1 in here]

Hansen (1987) argues that a classic adverse selection problem arises in M&A transactions when targets possess proprietary information about their own value. Bidders can mitigate IA in several ways, including paying a lower purchase price (Makadok and Barney, 2001), paying with stock (Hansen, 1987, Finnerty et al., 2012), and using financial advisors (Officer, 2007, Leledakis et al., 2021). Financial advisors, incentivized by appropriate fees, use their expertise to identify synergies and collect value relevant information concerning potential targets. In addition, small direct equity holdings by the bidder in a target, termed toeholds, provide an information source for the bidders (Povel and Sertsios, 2014). However, a toehold purchase may create rumours of a pending bid that can trigger a pre-bid run-up of the target's market value that only serves to increase the offer price (Ravid and Spiegel, 1999) and/or lead to target's rejecting negotiation talks. (Betton et al., 2009). Therefore, target equity held by funds connected to deal advisors may generate a valuable source of information for acquirers, and such indirect access to information may ultimately be less costly than a direct toehold.<sup>3</sup> The existence of such 'indirect toeholds' can be important for bidders with different initial M&A strategies. The acquirer may already have a target in mind and then choose an advisor best suited for the job, namely one contributing an 'indirect toehold' together with other types of expertise. There may be an alternative path in which the acquirer desires firm growth through M&As, and hires an advisor who helps to select a target. As the advisor may expect to obtain (or already possess) superior information about certain potential targets through its connected hedge funds, it may be more likely to recommend one of these firms as a target. Both alternatives result in a higher likelihood of a connected advisor actually working on the deal.

Under this 'indirect toehold' scenario, we would expect:

(1) an advisor whose connected hedge funds own target's shares is more likely to be hired, either because the acquirer chooses the connected advisor or the advisor recommends a firm with connected fund holdings to be the target;

(2) a reduction in IA between the target and bidder, hence an increased likelihood of a successful acquisition;

(3) the acquirer to gain enhanced bargaining power, leading to a reduction in the premium paid, a lower target abnormal return, and a higher acquirer abnormal return on the announcement date;

(4) no pre-announcement increase in holdings by connected hedge funds in the target, due to the potential reduction in the target's announcement returns.

In the second scenario, information flows from the acquirers to the advisors and finally to their connected hedge funds. It follows these hedge funds obtain privileged information and

 $<sup>^{3}</sup>$ As we discuss later, advisory banks may compensate connected hedge funds through the services they provide. Indeed, Kumar et al. (2020) and Qian and Zhong (2018) show that hedge funds reap benefits from reciprocal information flows between themselves and their prime broker.

may earn superior returns by taking positions in the target firm prior to the announcement. We designate this possibility the 'information advantage' scenario.

Qian and Zhong (2018) examine hedge funds' investment in new publicly listed stocks and find that hedge funds obtain informational advantages from their prime brokers who serve as underwriters for the listing. Bodnaruk et al. (2009) document that financial conglomerates in which affiliated investment banks advise the bidders, increase their positions in targets before M&A announcements. This tactic is associated with a greater probability of deal success and is highly profitable. Applying analogous reasoning to connected hedge funds, if information flows from advisory banks to hedge funds with prime brokerage connections, these funds may exploit this information by taking a position in the target firm in advance, realizing any gains around the M&A announcement.

Under this 'information advantage' scenario, we would expect:

(1) the acquirer to be less likely to choose an advisor whose connected hedge funds hold equity in the target, and a firm's probability of becoming a target to decrease with connected fund holdings;

(2) connected funds to increase their holdings in target firms before the acquisition announcements to generate abnormal returns;

(3) connected hedge funds to be motivated to facilitate the deal<sup>4</sup>, hence the likelihood of deal completion to increase;

(4) connected fund holdings to be positively related to both the target premium and abnormal returns, and negatively related to acquirer abnormal returns on the announcement date.

Table 1 summarizes all the expected effects under the two scenarios. Both scenarios generate the same prediction for deal completion probability, but opposing predictions for all the other variables. Hence, our main analysis focuses on those outcomes with differential

<sup>&</sup>lt;sup>4</sup>Connected hedge funds may try to directly affect the merger outcome, e.g., by lobbying and voting appropriately in shareholder meetings, to realize capital gains from their positions.

predictions under the two channels of information flow, and we report the analysis of the completion probability in the Supplementary Appendix.

[Table 1 in here]

### 2.1 Choice of advisor/target

To evaluate the predictions from our two information flow scenarios relating to the choice of advisor, we estimate the following probit regression:

$$Pr(Advisor\_Chosen^{i,j}) = \phi(\alpha + \beta Connection\_measure^{i,j} + \delta Controls^{i,j})$$
(1)

where  $Advisor\_Chosen^{i,j}$  equals one if an advisor *i* is hired for a particular deal *j*, and zero otherwise, and  $\phi$  is the standard normal pdf. For an advisor to enter the estimation, they must have been the advisor in at least one acquisition during the year immediately prior to the current acquisition announcement.

To measure connections, we use two different variables. The first is a dummy variable,  $Connected^{i,j}$ , that equals one if an advisor i is the prime broker of a hedge fund with holdings in the target firm in acquisition j in the quarter prior to the deal announcement, and zero otherwise. The second variable,  $Holding\_connected^{i,j}$ , is the percentage holdings of advisor i's connected hedge funds in the target firm in acquisition j in the quarter prior to the deal announcement.

We identify 20 advisors in our sample that are connected in at least one deal. They include: the Bank of America Corporation, JP Morgan Chase & Co., Citigroup Inc., Goldman Sachs Group, Morgan Stanley, Merrill Lynch, Lehman Brothers, Bear Stearns, UBS Group AG, Deutsche Bank AG, Credit Suisse Group AG, Royal Bank of Canada, Barclays plc, The Bank of Montreal, BNP Paribas SA, HSBC Holdings plc, Jefferies Financial Group Inc, KPMG International Limited, Société Générale S.A, and Wells Fargo & Company. The number of unique advisors is 132.<sup>5</sup>

In choosing the remaining control variables, we follow Sibilkov and McConnell (2014): Acquisition times is the number of times an advisor serves as an acquirer's advisor one year before the acquisition announcements; Acquisition value is the logarithm of the total value of all acquisitions in which an advisor serves as an acquirer's advisor one year before the acquisition announcements; Prior advisor equals one if the advisor serves as an M&A advisor for the acquirer one year before the acquisition announcement, and zero otherwise; Expertise equals one if the advisor serves as an acquirer's advisor in an acquisition that involves a target from the same two-digit SIC industry as the target of the current acquisition, and 0 otherwise.

We account for the possible influence of shareholder activism by using a dummy variable in our regressions, *Activism*, which equals one if any type of shareholder activism is reported via form 13D within 5 years before a deal announcement, and zero otherwise. Here, shareholder activism occurs when an individual or group of shareholders acquires beneficial ownership of more than 5% of a voting class of a company's securities, as reported via form 13D. Our sample contains 18 deals associated with such shareholder activism.

In a similar vein, for bidders who participate in multiple deals in our sample, we test (via a probit model) if the probability of adding a new advisor to the previous deal's team of advisors increases with the connected hedge fund holdings of the new advisor.

$$Pr(New\_Advisor^{i,j}) = \phi(\alpha + \beta Connection\_measure^{i,j} + \delta Controls^{i,j})$$
(2)

<sup>&</sup>lt;sup>5</sup>The 20 advisors that are connected in at least one deal include the largest investment banks, and collectively, they advise on 58% of our sample of deals. In these deals, every advisor may still be unconnected. While we base our main results on all deals in our sample, we repeat the complete analysis on a sub-sample of deals which use these 20 advisors only. The results are qualitatively the same as those of the main analysis, and are reported in full in online Appendix A.

where  $New_Advisor^{i,j}$  takes a value of one if an advisor *i* that is hired for deal *j* is new compared to those used by deal *j*'s bidder in its previous deal.

We examine the alternative pathway, that the advisor recommends the target, using the following probit regression:

$$Pr(Target\_Chosen^{k,j}) = \phi(\alpha + \beta Connection\_measure^{k,j} + \delta Controls^{k,j})$$
(3)

where  $Target\_Chosen^{k,j}$  equals one if a firm k is chosen to be the target for a particular deal j, and zero otherwise. We use propensity score matching to find potential targets for each deal. Following Palepu (1986), the determinants include: firm size (log of total assets), book-to-market ratio, return on equity, leverage (equity-to-asset ratio), liquidity (current assets/current liabilities), tangibility (tangible assets/total assets), sales growth, and the price-earning ratio. We obtain each firm's propensity score as the probability that a firm with given characteristics will be a merger target. For each actual target, we select five firms in the same industry with the closest score and active in the same year, to define a set of potential targets.

To measure connection, we use either a dummy variable  $Connected^{k,j}$  that equals one if, in the quarter before the announcement, a firm k is held by hedge funds whose prime broker is the advisor in acquisition j, and zero otherwise, or  $Holding\_connected^{k,j}$ , that is, the percentage holdings of such connected hedge funds in firm k in acquisition j.

On this basis, we begin to empirically discriminate between the two information scenarios. The 'indirect toehold' scenario predicts a positive relation between connected fund holdings and both the probability of an advisor being hired and of a firm becoming a target. This implies positive  $\beta$ s in Equations 1 to 3. The relationships underlying the 'information advantage' scenario dictate these coefficients will carry the reverse signs.

We also control for the potential selection bias. In our analysis, we deliberately include

only those deals with non-zero hedge fund holdings. This setting allows us to isolate the effects of connections instead of contaminating the analysis with any additional effects of why hedge funds in general choose to hold target firms. Nevertheless, we also include the Inverse Mills Ratio in all equations to account for a possible selection bias on the part of hedge funds. The first-stage probit analysis employs all target firms and estimates the probability of hedge funds owning equity in these target firms. Following Dai et al. (2017), we use: the deals' percentage of cash payment, indicators for a hostile deal and tender offer, holdings by mutual funds in acquirers, the premium paid to the target, the target's return on assets, leverage, size, and book-to-market ratio as predictors of positive hedge fund stakes in targets. We then include the resulting Inverse Mills Ratio ( $IMR_holding$ ) in all regressions.

Another important selection issue arises in this setting, namely that connections may be related to the advisor's importance and reputation in financial markets, and bidders may deliberately choose a prestigious (hence connected) advisor. To address this aspect of the selection decision, we estimate a probit model for the probability that the acquirer chooses a large investment bank as an advisor. We also include the corresponding Inverse Mills Ratio  $(IMR\_bigbank)$  in all regressions. Following Song et al. (2013), the acquirer's choice of a large, reputable bank as the advisor is a function of deal size, percentage of cash payment, an indicator of a hostile deal, holdings by mutual funds in acquirers, whether the targets and acquirers are in different industries, the number of bidders, the fraction of target shares held by the acquirer before deal announcement, both target and acquirer's book-to-market ratio, and the target's return on equity. While our main regression is conducted on the full sample, we also use a subsample of deals involving connected advisors at least once. Our main results remain quantitatively unchanged.

### 2.2 Change in hedge fund holdings

To assess the effect of information flow on hedge fund equity holdings, we estimate the following Equation 4 based on individual hedge fund holdings:

$$\Delta Holding_{t-1}^{f,j} = \alpha + \beta Connected^{f,j} + FE_{deal} + FE_{fund} + \varepsilon^{f,j} \tag{4}$$

where  $\Delta Holding_{t-1}^{f,j}$  are the changes in the holdings of hedge fund company f of the target's stock in acquisition deal j in the quarter before the deal announcement (the difference between the holdings at the end of quarter t-1 and the previous quarter t-2, with quarter t being the announcement quarter). We measure holdings as the number of shares owned by a fund scaled by the total firm shares outstanding. Connected<sup>f,j</sup> is a dummy variable that equals one if the prime broker of hedge fund f is also the advisory bank in deal j, and zero otherwise. To account for other characteristics of the deals and funds that may impact the outcome, we include deal and hedge fund fixed effects in the regression.<sup>6</sup>

Under the 'indirect toehold' scenario,  $\beta$  should be non-positive in Equation (4), indicating that connected funds do not increase their holdings in target firms any more than unconnected funds before the acquisition announcements. The 'information advantage' scenario would imply a positive  $\beta$ , with connected funds exhibiting a higher pre-announcement change in their holdings of target firms.

We further check whether connected and unconnected funds exhibit differences in their ownership of the target firm following the deal's announcement but prior to its completion, and if any changes in their equity holdings indicate alternative possible channels of information transmission. Generally, existing evidence suggests that hedge funds are likely to purchase targets' equity after the deal announcement (Cui et al., 2023; Dai et al., 2017; Mitchell et al., 2004). If connected hedge funds additionally increase their holdings in the

<sup>&</sup>lt;sup>6</sup>For comparison, we analyze the changes in hedge fund holdings in acquirers in a similar fashion.

target subsequent to the deal's announcement but prior to its completion, it may suggest that their advisors share information pointing towards the likelihood of successful deal completion, or information emanating from the fund's relationship with the target indicates the deal is more likely to be completed. Such a pattern may also be indicative of an implicit contract between hedge funds and their prime brokers acting as deal advisors, in which funds purchase additional stakes in the target and then vote to help the bidder secure the deal. If connected funds are not seen to disproportionately increase their holdings, either there may be no information flowing between the advisor and connected hedge funds, or the information flowing from hedge funds to advisors may take the form stipulated by the 'indirect toehold' mechanism. In the latter case, funds may actually expect the bidder to underpay on the deal, so they choose not to increase their holdings in the target.

To address the post-announcement change in holdings, we restrict the sample to deals lasting more than one quarter for which we have another observation of holdings in the target prior to deal completion. In total, we identify 641 such deals. We then re-estimate Equation (4) using the changes in the holdings of each fund from the pre-announcement quarter to the post-announcement quarter ( $\Delta Holding_{t+1}$ ) as the dependent variable.

In a similar vein, we analyze the post-completion changes in the holdings in bidders for the completed deals.<sup>7</sup> We first calculate implied holdings in bidders before deal announcement, and then consider the changes from the pre-announcement implied holdings to the post-completion ones, as reported in the quarter of the deal completion. Implied hedge fund holdings in a bidder at the end of quarter t - 1 equals the sum of the actual hedge fund holdings in the bidder and hedge fund holdings in the target converted to bidder-shares equivalent using the reported exchange ratio. For deals 100% financed by cash the exchange ratio is zero. This specification allows us to capture potential trading in bidder or target shares during the whole period of the deal negotiations.

<sup>&</sup>lt;sup>7</sup>We thank Russell Wermers for this suggestion.

As a robustness check, we evaluate changes in holdings of connected and unconnected hedge funds based on the share of a hedge fund portfolio allocated to the target/acquirer (instead of the fraction of total shares outstanding held in the target/acquirer, as above). We use changes in the fractional value of the target or acquirer in the connected or unconnected hedge fund portfolios ( $\Delta Shares$ ) that capture the importance of the firm in the hedge fund portfolio, and repeat the entire analysis of changes in holdings.

### 2.3 Premium and abnormal returns

To evaluate the effect of information flow on the deal premium, and the cumulative abnormal returns for both target and acquirer, we estimate Equation 5:

$$\left.\begin{array}{c}
Premium^{j} \\
TCAR^{j} \\
ACAR^{j}
\end{array}\right\} = \alpha + \beta Connection\_measure^{j} + \delta Controls^{j} + \epsilon^{j} \tag{5}$$

where Premium is the deal premium computed as the ratio of the offer price per share to the target's closing share price one week<sup>8</sup> before the acquisition announcement; TCAR(ACAR) is the cumulative abnormal returns (CARs) for target (acquirer) firms on the acquisition announcement date, computed using the event study methodology of Brown and Warner (1985). Following Cai and Sevilir (2012) we estimate the Fama-French 3-factor model for each firm over the 200 trading days ending two months before the announcement. We compute the abnormal returns on the announcement day as the difference between the realized and expected returns. In the main specification, CAR represents the announcement date abnormal return. In Section 8, we further calculate cumulative abnormal returns over different windows surrounding the announcement date.

The key variables of interest measuring connections are  $Connected^{j}$ , a dummy variable

 $<sup>^{8}</sup>$ We also use the share price four weeks before the announcement in a robustness check specification.

that equals one if a connected hedge fund holds the target, and  $Holding\_connected^{j}$ , which represents the total holdings of all connected hedge funds in the target firm in deal jin the quarter before the announcement. We control for the total hedge fund holdings in a target firm in that quarter ( $Holding\_total$ ), hedge funds' holdings in the acquirer ( $Holding\_acquirer$ ), and acquirers' holdings in the target (Toehold).

In choosing the other control variables, we follow Bodnaruk et al. (2009) and Gao et al. (2018). All variables are measured in the last fiscal year prior to the acquisition announcement unless otherwise stated. Return on assets (ROA) is the return on a target firm's assets; Leverage is the equity-to-assets ratio of a target firm; B/M is target's book-to-market value of equity; Tangible is target's ratio of total tangible assets to total assets;  $Size_a$  is the logarithm of acquirer's market capitalization;  $B/M_a$  is acquirer's book-to-market value of equity; *RELSIZE* is the ratio of target to bidder total assets; *Valpct* is the ratio of deal value to acquirer market capitalization; *Holding\_MF* is the mutual fund holdings in a target firm one quarter before the acquisition announcement; Pctcash is the percentage of cash payment in the consideration; *Hostile* is a dummy variable taking the value of 1 for a hostile deal, and 0 otherwise; *Tender* is a dummy variable taking the value of 1 for tender offers, and 0 otherwise; Merger of equals is a dummy variable taking the value of 1 when the target and acquirer consider their merger a merger of equals;  $Diff_{-I}Ind$  is a dummy variable taking the value of 1 for a deal where bidder and target are from different 3-digit SIC code industries, and 0 otherwise; Number of bidders is the number of bidders involved in a deal.

The two information flow scenarios generate contrasting predictions for premium and abnormal returns. The 'indirect toehold' mechanism predicts a negative relation between connected hedge fund holdings and both premium and TCAR, hence, a negative  $\beta$  in Equation (5) for these specifications. It predicts a positive relationship with ACAR, so the expectation of a positive  $\beta$ . The 'information advantage' scenario yields precisely the reverse relationships.

We anticipate the effects to be more pronounced for targets with an enhanced degree of IA for which the marginal benefits of IA reduction are greater. Therefore, we further add the interactions between  $Holding\_connected^{j}$  and highIA into Equation (5), where highIA takes the value of one for targets characterized by high information asymmetry. We use stock market and accounting information from CRSP/Compustat and the information on analysts' coverage and earnings forecasts from I/B/E/S to compute the following seven measures for each target firm following Karpoff et al. (2013), Cheng et al. (2016) and Borochin et al. (2019). All variables are measured in the year before the acquisition announcement unless otherwise indicated.

(1) Amihud is the average Amihud illiquidity measure;

(2) SPREAD is the average bid-ask spread;

(3) Size is the natural logarithm of the book value of total assets;

(4) COVER denotes analysts' coverage, computed as the number of analysts following the target;

(5) ERR is the relative forecast error, computed as the ratio of the absolute difference between the forecast and the actual earnings per share to the price per share;

(6) DISP is the average standard deviation of earnings per share over the share price;

(7) *volatility* is average standard deviation of daily stock returns.

We calculate the IA value of a target as follows. For each value of Amihud, SPREAD, ERR, DISP, and volatility, which lies above the median, and for Size and COVER, lying below the median for a specific target firm, we assign one risk point to its IA value. A target is said to have high IA if the sum of its risk points (the final value of IA) is above the median value of all targets.

We include target industry fixed effects and year fixed effects and use robust standard errors clustered by industry in Equations (1)-(3) and (5). We further add advisor fixed effects

to Equations (3) and (5). In Equation (4), as previously mentioned, we include both deal and fund fixed effects. Table 2 lists all the key variables and their definitions.

[Table 2 in here]

## 3 Data

We use three data sets: (1) a hedge fund sample from the TASS and Eurekahedge databases, (2) hedge fund holdings data from the 13f filings to the Security and Exchange Commission (SEC), and (3) a sample of M&A transactions with detailed information from the Eikon database. We compile our hedge fund sample from the TASS and Eurekahedge databases over the January 1994 to September 2019 period, including information on affiliated companies, such as prime brokers. U.S. registered hedge fund investment companies that manage over \$100 million are required by the SEC to file quarterly reports on their holdings. We aggregate all individual hedge funds managed by the same hedge fund companies and obtain their holdings from the CDA database (Thomson Reuters, 13f filings) following Cui et al. (2023)<sup>9</sup>. In total, our sample comprises 5,713,269 data points of holdings (a hedge fund company-quarter-security uniquely defines each data point), with 651 hedge fund companies holding at least one of the target firms one quarter before the deal announcement.<sup>10</sup>

Our sample of acquisitions, announced between January 2000 to September 2019, is from the Eikon database. We apply several filters commonly used in prior M&A literature (see Boyson et al., 2017; Dai et al., 2017; Wu and Chung, 2022), namely: (1) the disclosed deal value must be greater than USD 1 million; (2) the acquirer should own less than 50% of the

<sup>&</sup>lt;sup>9</sup>For each hedge fund company, we check information in Bloomberg to ensure that no company has a side business, such as mutual funds or insurance.

<sup>&</sup>lt;sup>10</sup>Hedge funds may request confidentiality for their holdings (Agarwal et al., 2013). Agarwal et al. (2013) show that confidential holdings of hedge funds outperform their original holdings. Hence, any results which include confidential holdings are likely to be even stronger than those we document.

target's stock before the acquisition and should seek to own 100% of the target's shares upon successful acquisition; (3) spin-offs, repurchases, and self-tenders are excluded; (4) both the bidder and the target must be U.S. public firms listed on NYSE or Nasdaq, as the hedge fund holdings data are only available for U.S. listed firms.<sup>11</sup> The initial sample contains 2,677 deals. We use only deals with non-zero hedge fund holdings in the target firm, and those for which all variables required for our baseline analysis can be computed using the data from CRSP and Compustat.<sup>12</sup> The final sample includes 931 deals. The target primary ticker symbol is used to match the firms in our M&A sample with the companies included in the hedge-fund holdings sample. Overall, there are 132 unique advisors in our sample, of which 20 have a hedge fund connection at least in one deal. An advisor is said to be connected if it acts as a prime broker to at least one hedge fund that holds equity in a target in a deal for which the advisor is employed. On average, connected advisors advise on more deals than those who are unconnected (9.772 versus 4.170) and advise on deals with greater value (95.406 versus 4.223 billion dollars).

In terms of deal characteristics (Table 3), deals with connected and unconnected advisors exhibit statistically significant differences across multiple dimensions. The average holdings of connected funds are 1.8% in deals with connected advisors, while they are by construction zero in deals with unconnected advisors. Holdings of hedge funds in the acquirer are greater for deals with connected advisors (10.1 % versus 8.5%). On average, deals with connected advisors have targets with higher ROA (-0.003 versus -0.017), higher leverage (0.420 versus 0.367), lower book-to-market value (0.499 versus 0.671), and lower tangible assets (0.802 versus 0.891). The acquirers in connected deals are larger (8.872 versus 7.692) and have a lower book-to-market ratio (0.265 versus 0.530). The connected deals are characterised by

<sup>&</sup>lt;sup>11</sup>This filter allows us to calculate the holdings of hedge funds in both the target and acquirer. Hedge funds may hold other companies, but this is not observed in our sample.

<sup>&</sup>lt;sup>12</sup>The largest loss of data of 990 and 448 deals is driven by the absence of information on target ROA and acquirer size, respectively.

a higher ratio of deal value to acquirer market capitalisation (0.580 versus 0.337), higher mutual fund holdings (0.128 versus 0.091), a higher percentage of the payment made in cash (0.619 versus 0.538), a larger overall deal value (6.204 versus 0.813 billion dollars), higher termination fees (0.099 versus 0.012 billion dollars), and a lower level of target information asymmetry (3.261 versus 4.896). The average number of advisors is 1.834 for deals with at least one connected advisor and 0.769 for deals without such advisors. On average, 5.1 connected hedge funds and 21.5 unconnected hedge funds take a stake in the target firm in deals with connected advisors, while 9.9 hedge funds hold the target in deals without such connections. Overall, the descriptive statistics suggest structural differences between the deals involving connected and unconnected advisors.

[Table 3 in here]

# 4 Empirical Results

Table 4 reports the estimates we obtain from Equation (1), capturing the determinants of an acquirer's choice of advisor.<sup>13</sup> Henceforth, statements of a coefficient's (high) significance indicate statistical significance at least at a (1%) 5% level. Results using *Connected<sup>i,j</sup>* and *Holding\_connected<sup>i,j</sup>* as connection measures are reported in Columns (1) and (2), respectively. The significant  $\beta$  coefficient, 0.50, in column (1) implies an advisor with prime brokerage connections to hedge funds holding the target firm is more likely to be chosen by an acquirer, controlling for other factors. For the average advisor in our sample, moving from a position of no connections to having connections increases its estimated probability of being selected from 10% to 15%. Similarly, the coefficient of 1.43 on *Holding\_connected* is also significant, indicating that acquirers are more likely to choose an advisor connected to hedge funds holding greater stakes in a target. These findings support the 'indirect toehold'

 $<sup>^{13}</sup>$ We present the first stage probit regression results used to compute the IMRs in online Appendix B.

channel of information flows, that emanating from connected hedge funds through to advisors and acquirers.<sup>14</sup>

The coefficients of other variables are consistent with the literature. Acquirers are more likely to select advisors with a higher number of acquisitions in the prior year, greater expertise in the target industry, and those possessing a previous connection with the acquirer. The coefficients on the  $IMR_{-holding}$  are statistically insignificant.

#### [Table 4 in here]

Table 5 reports the estimation results from Equation (3), which explains the acquirer's choice of target. The significant positive coefficient  $\beta$  on *Connected* in column (1), suggests that a firm's probability of being a target increases if the advisor is connected to hedge funds holding its equity. Indeed, the estimated probability of the firm being chosen increases from 18% to 37% when moving from a position of no connections to having a connection. The coefficient on *Holding\_connected* is also significant, indicating that acquirers are more likely to choose a target whose connected funds hold more equity. Regarding other control variables, larger firms with a high book-to-market ratio are less likely to be chosen as targets while the probability is enhanced for higher ROE firms. These findings support the notion that advisors are more likely to recommend firms as targets if their connected funds hold equity in these firms.

### [Table 5 in here]

Table 6 reports the results from estimating Equation (4), which captures the changes in the individual hedge fund holdings (and shares) in target and acquirer before and after the

 $<sup>^{14}</sup>$ As for the probability of adding a new advisor, the results reported in Table C1 in the online Appendix point in the same direction: this probability increases if the new advisor has prime brokerage connections to hedge funds holding the target firm. The level of equity holdings is also positive but statistically insignificant in this specification.

deal's announcement, as well as changes in implied holdings in bidders after its completion. The coefficient on *Connected* is statistically insignificant in both Panel A and Panel B. No apparent differences are evident between connected and unconnected funds with respect to changes in their equity holdings either one quarter prior or subsequent to the acquisition announcement. This finding suggests that either no information is exchanged between the advisor and connected hedge funds relating to the upcoming deal, or that connected funds optimally choose not to increase their holdings. The latter maybe interpreted as rational behaviour, as under our 'indirect toehold' mechanism, hedge funds are unlikely to achieve enhanced abnormal returns on their target holdings. In Panel C, the coefficients on *Connected* are significantly negative in columns (1) and (3), suggesting that connected hedge funds reduce holdings in targets over the course of deal negotiation, but not immediately after the deal announcement.

#### [Table 6 in here]

The results relating to the pattern of abnormal returns also support the 'indirect toehold' mechanism (Table 7). Connected hedge fund holdings significantly decrease premium and announcement abnormal returns of targets, with the coefficient values of -0.09 and -0.07 (Columns (1) and (3) of Table 7).<sup>15</sup> The coefficients on *Holding\_connected* carry the expected negative signs in columns (2) and (4) for premium and TCAR and positive in column (6) for ACAR, albeit they are insignificant.

Table 8 presents additional results in which we highlight the effect of target information asymmetry, and report the results for target and acquirer abnormal returns computed over two different event windows, namely a 3-day [-1, +1] and an 11-day [5, +5] window (Hillmer and Yu, 1979; Krivin et al., 2003). The coefficients on *Holding\_connected*  $\times$  *highIA* are negative and significant in columns (1) to (4) for the premium and for all the TCAR windows.

<sup>&</sup>lt;sup>15</sup>We run the same model for the premium estimated based on the target market value four weeks before the announcement and the results, reported in online Appendix Table E1, are qualitatively unchanged.

A one standard deviation increase in connected fund holdings in high information asymmetry targets translates to 6.8 bp and 4.5 bp decrease in premium and target announcement abnormal returns, respectively. Given the average value of TCAR of 0.174%, such a decrease amounts to more than 25% of the average level of TCAR.

In terms of control variables, general hedge fund involvement, as captured by the total holdings of hedge funds in the target, reduces target abnormal returns and increases acquirer abnormal returns. The premium consistently increases with acquirer size and the number of bidders, and decreases with target ROA. The target abnormal returns decrease with the target ROA and increase with acquirer size and target tangible assets. Bidder abnormal returns increase with the percentage of cash payment.

Overall, our baseline results are consistent with the 'indirect toehold' hypothesis that advisors use connected hedge funds with holdings in the target firm to obtain additional target-relevant information, thereby helping the bidder to reduce informational asymmetries. Consequently, advisors are more likely to be chosen if they are connected to hedge funds holding equity in the target and/or such advisors are more likely to recommend such a connected target. This leads to a reduction in the premium and lower target announcement returns, especially for high-IA targets.

[Tables 7 and 8 in here]

# 5 Hedge Funds' Information Sharing Incentives

The empirical evidence we present relating to the 'indirect toehold' mechanism, suggests that hedge funds with equity holdings in an M&A target are a source of certain value-relevant information for the bidder, mediated through the connected advisor. This channel leads to a premium reduction and lower returns to the target's owners. Implicitly, this outcome also harms the connected hedge fund's interests. Now we inquire if such a sacrifice in returns can actually serve to benefit these hedge funds.

One possible explanation maintains that connected hedge funds are willing to forego target abnormal returns in exchange for compensating benefits (possibly informal) conferred by their prime brokers (see, for example, Chung and Kang, 2016; Kumar et al., 2020; Qian and Zhong, 2018). In such a situation, sharing information may be optimal from the funds' perspective when the associated benefits outweigh the costs. This situation is facilitated when the portfolio losses they incur from the lower premium paid for targets are limited. To test this conjecture, we examine hedge funds' incentives and disincentives to share information from three perspectives: (i) the importance of the target in the hedge fund portfolio, (ii) the importance of the prime broker to the hedge funds, and (iii) hedge fund past performance and flows.<sup>16</sup>

#### 5.1 Target importance in the hedge fund portfolio

We use three measures to assess the importance of the target firm in the hedge fund portfolio: (1) direct hedge fund investment: the fraction of the total hedge fund portfolio allocated to the target firm, (2) hedge fund industry specialization: the fraction of the hedge fund portfolio invested in the target's industry, and (3) the hedge fund's holding period in the target.

To implement our first measure, for every firm held by each hedge fund, we compute fractional holdings as the ratio of the dollar value of a fund's holdings in the firm scaled by the total value of the reported holdings of the hedge fund. If the fractional holdings in a target lie below the 30th percentile, it is deemed to represent a low share of the hedge

<sup>&</sup>lt;sup>16</sup>Another interesting question is whether connected hedge funds are more willing to share information when they hold both the target and the acquirer. In such a setting, any losses on the side of the target may be more than compensated by gains from the acquirer. Testing this possibility is not feasible in our sample, as there are only three deals where connected funds have such cross-holdings.

fund portfolio, signalling it is of lesser importance to the hedge fund. In our sample, a 30th percentile holding of a hedge fund is 0.016% per firm. Next, for every target in our sample, we compute the total holdings by hedge funds for which this target is of low importance, *Holding\_connected\_lowshare*, and add this variable to Equation (5). We expect connected funds to be more willing to share information about targets in exchange for beneficial consideration from their prime brokers when their equity stakes in targets account for a smaller share of their whole portfolio.

The second measure is a hedge fund's specialisation in the target industry. For each hedge fund, we compute fractional holdings in the industry as the ratio of the total dollar value allocated to those firms in the same four-digit SIC code as the target, scaled by the total value of the reported holdings of the hedge fund. We say that a hedge fund does not specialise in that industry, hence the target is of lesser importance to the hedge fund, if the fund's fractional holdings in the industry are below the 30th percentile. In our sample, a 30th percentile holding of hedge funds is 0.204% per industry. We include total holdings in the target by connected hedge funds that do not specialize in the target industry *Holding\_connected\_lowsic* in Equation (5). We expect connected funds to be more willing to share information about targets in return for benefits from their prime brokers when they do not specialise in the target industry.

Finally, we consider the period for which the hedge fund holds the target prior to the M&A deal. A lengthier target holding period may indicate the fund is a long-term investor and consequently less inclined to share information with prime brokers if the potential outcome is underpayment in the M&A deal. Hedge funds that have only recently acquired stakes in the target may have less vested interest in the company, and the benefits of strong prime brokerage relations may outweigh the costs of diminished returns. Mirroring the previous specifications, we add *Holding\_connected\_shortperiod* to Equation (5) which measures total holdings by connected hedge funds invested in the target for not longer than one quarter

before the announcement. We expect connected funds to be more willing to sacrifice potential target premiums and announcement returns when they have been holding the target only for a short period.

### 5.2 Importance of prime brokerage relations for the hedge fund

A hedge fund may be more willing to share sensitive information with its prime broker when the latter is of primary importance for fund operations. We use two different measures to assess this importance: (1) the number of prime brokers associated with a hedge fund company, and (2) the total hedge fund company assets serviced by a given prime broker.

Funds with multiple prime brokers exhibit less dependence on each one individually, while a secure relationship is of more importance to hedge funds with only a single prime broker. Our expectation is that hedge funds with a sole prime broker may be more likely to share information, as the benefits of sustaining a cordial brokerage relationship may outweigh the losses resulting from any lower premium paid in an M&A. Analogous to the previous specifications, we include *Holdings\_connected\_singlePB* in Equation (5) capturing holdings by connected hedge funds having only one prime broker. We expect connected funds with only one prime broker to be more willing to share information.

Since the holding information is at a hedge fund company level, the prime brokerage relations are also measured at the company level. If a company operates several hedge funds and each of these hedge funds has its own prime broker, the company is classified as having multiple prime brokers. At the same time, if a company has a large flagship fund and several small satellite funds, it may only be the relationship with the flagship fund's prime broker that is of material importance for the company, as despite the multiple connections, in practice the fund company is more reliant upon sustaining relations with its main broker. To account for this possibility, we use the share of the assets under management linked to a dominant prime broker as a proxy for the importance of hedge fund-prime broker relations. For each hedge fund company reporting prime brokers b, we compute the fraction of assets the prime broker services based on the size of constituent funds:

$$Frac\_Assets_b = \frac{\sum_{i} Fund\_AUM_i^b}{\sum_{j} Fund\_AUM_j},$$
(6)

where  $Fund\_AUM_j$  are assets under management of fund j within a given hedge fund company, and  $Fund\_AUM_i^b$  are the assets under management of fund i that reports prime broker b. We define a prime broker to be dominant if it services at least 70% of the assets of the company. We proceed to compute the total holdings of connected funds in the targets if the deal advisor is the dominant prime broke of the hedge funds  $Holding\_connected\_dominant$ 70, and incorporate this variable in Equation (5). We expect that funds with a dominant prime broker are more willing to share information.

### 5.3 Hedge fund past performance and flow

Recent performance and fund flow are likely to influence a hedge fund's willingness to share information with their prime broker, but ex-ante it is difficult to predict the direction of the effect. Consider poorly performing funds where the marginal benefit of a larger M&A announcement return on their holdings in the target is high. These funds may be reluctant to share information with their prime broker(s) if such sharing potentially harms performance. At the same time, poor performance is often followed by outflows. Hedge funds' liquidity deteriorates and they become more reliant on their prime brokers to provide financing to sustain their operations. This enhances incentives for funds to foster good relationships with their prime brokers and to share information.

To evaluate the effect of hedge fund performance, we calculate monthly returns at the hedge-fund-company level as the asset-weighted monthly returns across individual hedge funds managed by this company. We classify a hedge fund company to be poorly performing if its average return over the quarter preceding the M&A announcement date is below the 30th percentile of all hedge fund companies active in that quarter. In our sample, an average 30th percentile of the returns is -0.07% per month. We include an additional variable into Equation (5) capturing holdings in the target by poorly performing hedge funds, *Holding\_connected\_lowret*.

To address the influence of fund flow, we first compute dollar flows for each fund *i* during month *m* using Equation (7), where  $Fund\_AUM_m^i$  denotes the assets under management of fund *i* at the end of month *m*, and  $Ret_m^i$  is the reported return for fund *i* during month *m*. We aggregate the monthly dollar flows for all individual hedge funds managed by the same hedge fund company *j* during quarter *q* to estimate quarterly flows. Following Agarwal et al. (2004), we scale company-level quarterly dollar flows by beginning-of-quarter company-level assets under management.

$$Fund\_DollarFlow_{m}^{i} = Fund\_AUM_{m}^{i} - Fund\_AUM_{m-1}^{i}(1 + Ret_{m}^{i})$$

$$QuarterDollarFlow_{q}^{j} = \sum_{i} \sum_{m} Fund\_DollarFlow_{m}^{i},$$

$$(7)$$

for months m in quarter q, and funds i in company j.

$$AUM_{q-1}^{j} = \sum_{i} Fund_{-}AUM_{q-1}^{i}$$

$$Flow_{q}^{j} = \frac{QuarterDollarFlow_{q}^{j}}{AUM_{q-1}^{j}}$$
(8)

We say that a hedge fund company has a low flow if its flow over the quarter prior to the M&A announcement lies below the 30th percentile of all hedge fund companies in that quarter. In our sample, an average 30th percentile of quarterly flows is -1.08% per quarter. Similar to the previous specifications, we incorporate a separate variable in Equation (5) capturing holdings in the target by connected hedge fund companies with low flows, *Holding\_connected\_lowflow*.

#### 5.4 Information sharing incentives: Results

Tables 9 to 11 present our findings. We report estimates only for the key variables of interest, the effects of the other control variables being similar to those reported in previous tables and we omit their discussion for the sake of brevity. Overall, our findings are consistent in corroborating the view that hedge funds for which the target is of less importance in their portfolio are more willing to share information with their prime broker. The effects of prime brokerage importance and fund flows are additionally pronounced for acquirer abnormal returns, further supporting the 'indirect toehold' mechanism of information transmission.

Specifically, if a high IA target is deemed to be of low importance in the hedge fund's portfolio, connected hedge fund holdings lead to significantly lower target abnormal returns (Panels B and C in Table 9). The coefficients of -8.29 and -29.96 on *Holding\_connected\_lowsic* × *highIA*, and *Holding\_connected\_shortperiod* × *highIA*, respectively, are both highly significant. These effects are economically meaningful. A one standard deviation increase in connected fund holdings with a low target industry specialization and/or a short holding period leads to a TCAR reduction of 4.4 and 14.28 basis points, respectively.<sup>17</sup> Furthermore, holdings by connected funds with a short investment period in the target lead to significantly lower premiums (Panel C of Table 9). The significant estimated coefficient of -32.57 implies that a one standard deviation increase in connected fund holdings leads to a reduction of 15.53 bp in the premium for targets with higher IA. Additionally, the effect of *Holding\_connected\_shortperiod* × *highIA* is positive and significant for ACAR, further supporting the 'indirect toehold' mechanism, and stronger

 $<sup>^{17}</sup>$ We observe no significant impact of connected fund holdings for funds with a low target share in the reported specification. However, holdings by hedge funds with low shares in the target significantly reduce premiums and target abnormal returns for all targets when we exclude the interaction with highIA.

information sharing in cases where the target is of low importance for connected hedge funds.

Importantly, this fund holding's effect is pronounced only for connected hedge funds and not for total holdings of funds with a low target share, low industry specialization, or a short holding period. This finding highlights the importance of the prime brokerage connection in the operation of the information transmission channel.

Regarding the importance of prime broker relations for hedge funds, we find that holdings by connected hedge funds with a single or dominant prime broker significantly decrease premiums and increase acquirer abnormal returns (Table 10). For example, the negative coefficient of -4.19 in column one indicates that one standard deviation increase in connected fund holdings with a single prime broker leads to a premium reduction of 3.5 bps basis points. As for ACAR, a one standard deviation increase in connected fund holdings leads to an increase in ACAR on the announcement date by 1.06 bp. Given the mean value of ACAR is -0.014%, this increase in ACAR nearly offsets its negative mean value.

Holdings by poor performing connected funds increase premiums and reduce acquirer abnormal returns, suggesting that those funds prioritize returns and are reluctant to share information with their prime brokers. In contrast, holdings by funds with low flow reduce premiums and increase acquirer abnormal returns, suggesting that funding liquidity constraints seem to motivate funds to prioritise their relations with prime brokers and share information (Table 11). For example, a one standard deviation increase in holdings by connected hedge funds with low flow decreases premium by 4.03 bp and increases acquirer abnormal returns on the announcement date by 1.53 bp. Again, it is important to note that these effects are driven only by connected hedge fund holdings. No such relationship is manifest for the total holdings of all hedge funds.

[Tables 9 to 11 in here]

# 6 Importance of Information Sharing for the Bidder

The observable effects of information sharing depend on the bidder's initial information set and the marginal benefit of each piece of information they obtain through the 'indirect toehold' channel. Information sharing is likely to be more important for the bidder when: (1) the target and bidder are from different industries, (2) the deal involves multiple bidders, (3) a higher fraction of the payment is made in shares, (4) the deal occurs during a merger wave, (5) a bidder chooses to pay higher fees to its advisors.

A bidder who lacks on-going expertise in the target industry will obtain greater benefits from becoming informed than a rival bidder with more industry experience (Povel and Sertsios, 2014). Hence, the benefits to a bidder of incremental information obtained through connected advisors may be more substantial in situations when the bidder and target are from different industries. To test this proposition, we include the interaction term  $Holding\_connected \times Diff\_Ind \times highIA$  in Equation (5). We expect information to have a greater impact when the target and bidder are from different industries.

Another factor affecting the benefits of information sharing is the number of bidders. Auction theory suggests that toehold bidders may secure a competitive advantage over rivals (Betton et al., 2009). Thus, the 'indirect toehold' generated by connected hedge funds may benefit bidders more in the presence of multiple bidders for the target. Following the previous specification, we include *Holding\_connected* × *Number of bidders* × *highIA* in Equation (5), where *Number of bidders* is the number of bidders involved in the deal. Information sharing is expected to be more important to a bidder in the presence of competing bidders.

Bidders tend to resort to stock payment if they have concerns about adverse selection on the target side (Hansen, 1987). Hence, the benefits of information sharing may increase when bidders offer stock payment, as the target is more likely to be relatively opaque. We include  $Holding\_connected \times Pctstock \times highIA$  in Equation (5), where Pctstock is the percentage of stock payment in the deal consideration. We expect the effects of information sharing to be greater when the bidder offers a higher fraction of payment with stock.

Information sharing may be more beneficial during merger waves, periods characterized by noisy information and enhanced uncertainty (Duchin and Schmidt, 2013). Following Ahern and Harford (2014), we calculate the dollar value of mergers for each industry-pair of acquirer and target industries in each year. We define a merger wave in an industry pair to exist when the dollar value of all deals in such a pairing in a year is above the 70th percentile. We then incorporate the interaction term  $Holding\_connected \times Merger\_wave \times highIA$  into Equation (5). Information sharing is likely to be more important to the bidder during merger waves.

Finally, information sharing may be more important for bidders who pay higher fees to their advisors. To test this proposition, we include the interaction term  $Holding\_connected \times Abnormal\_fees \times highIA$  into Equation (5). Advisors may also be more willing to use their hedge fund connections to help the bidder in the presence of financial incentives to do so, namely when they receive enhanced advisory fees. We calculate the fees paid by the acquirer as a percentage of deal value, and define abnormal fees (*Abnormal\_fees*) as the difference between the realized percentage fees and the average percentage fees for the two deals in the same industry with the closest deal size over the preceding two years.

The results for premium and target abnormal returns (Table 12) support our conjectures regarding the scenarios in which bidders place greater importance on information sharing. The negative effect of connected hedge fund holdings is amplified if targets and bidders come from different industries, a higher number of bidders is involved, and in those industries experiencing merger waves. For example, the coefficients of -6.92, -3.01, and -6.17 for premium are negative and significant in Panels A, B, and D. Once again, these effects are associated exclusively with connected hedge fund holdings, while the interactions with total hedge fund holdings are insignificant. Furthermore, connected funds' holdings negatively

impact target abnormal returns and positively affect acquirer abnormal returns in the presence of abnormally high advisor fees (Panel E in Table 12), with the estimated coefficients of -1.69 and 0.36 both (at least marginally) significant.

[Table 12 in here]

# 7 Extensions

### 7.1 Insider trading

Whenever information is shared, especially informally, between market participants around the time of information-sensitive corporate events, an important consideration relates to the use of this information. In particular, does it increase the likelihood of insider trading by any of the counterparties involved? This motivates an examination of the possibility of insider trading activity involving our sample of M&As. We examine the litigation releases from the U.S. Securities and Exchange Commission (SEC) relating to insider trading around M&A events, and match the litigation releases with the targets in our sample. We identify 65 instances of insider trading, accounting for 6.98% of deals. Following analysis of the corresponding SEC releases and complaints, we compile the following categories of the source of information leakage: senior management, including the board of directors of the target (acquirer), personal connections of senior management of target (acquirer), other employees in target (acquirer), employees in affiliated non-investment bank companies (such as audit firms or legal advisors), employees in affiliated investment banks, personal connections of employees in affiliated investment banks, hedge funds, unknown parties, and others. Table 13 reports the resulting classification. The majority of cases involve employees in affiliated companies, with 17 stemming from non-investment bank firms and 15 from investment banks and their connected individuals, together accounting for almost 50% of the
insider trading cases. A total of 16 (14) cases are related to senior management, connected individuals, or other employees in the target (acquirer) firm, accounting for 24.6% (21.5%) of all cases. Notably, only one case involves insider trading by a hedge fund (with the source of information being target top management), indicating that such activity is uncommon (or more difficult to detect) in M&A transactions. No other cases relating to these insider trading investigations mention hedge funds.

Given this detailed analysis of the actual insider trading cases, we do not expect that connected hedge fund involvement influences the probability of insider trading. Nevertheless, we formally evaluate the effects of connected fund holdings on this probability by estimating a probit model for the probability of insider trading on connected funds' holdings and the other control variables used in Equation (5). We find neither a significant effect of connected fund ownership on the probability of insider trading, nor a significant effect of any other deal characteristics, apart from some advisor fixed effects.<sup>18</sup> Overall, connected funds do not appear to either use or share private information about M&As for the purpose of (detectable) insider trading.<sup>19</sup>

#### [Table 13 in here]

## 7.2 Short-selling in acquirers

Short-selling the acquirer's stock is another way traders generate profits around M&A announcements, and hedge funds are known for actively adopting short-selling strategies (Appel et al., 2020). If connected hedge funds receive information about an upcoming deal, they may short-sell the bidder's equity in advance of the public announcement and/or increase their level of short selling. In contrast, if connected hedge funds envision

 $<sup>^{18}\</sup>mathrm{We}$  report the results in online Appendix F1.

<sup>&</sup>lt;sup>19</sup>Our results differ from those in Dai et al. (2017). These authors focus on insider trading by hedge funds with a short-term investment horizon as a group, while we are interested in whether connections via prime broker/advisor lead to information leakage to/from hedge funds.

information sharing with the bidder, they may refrain from such (strong) short-selling activity in the bidder's stock. These possibilities motivate the examination of the pattern(s) of short-selling in the bidder's shares around the M&A announcement, and relate any such patterns to the holdings of connected hedge funds. Following Dai et al. (2017), we compute the monthly short interest ratio (SIR) for each acquirer as described in Equation (9), where  $SHORTINT\_ADJ_t$  is the adjusted short-selling in an acquirer in month t and  $SH\_OUT\_ADJ_{t-1}$  is the adjusted number of shares outstanding in month t - 1.

$$SIR_{t} = \frac{SHORTINT\_ADJ_{t}}{SH\_OUT\_ADJ_{t-1}}$$

$$\tag{9}$$

Then we calculate the average short interest ratio for each bidder over a six month period, leaving a three-month gap prior to the announcement, as shown in Equation (10), where t is the month of the deal announcement. Finally, we compute the abnormal SIR (ASIR) for each bidder in months t-1, t, and t+1 using Equation (11).

$$AV\_SIR\_PAST = \frac{1}{6}\sum_{k=4}^{9}SIR(t-k)$$
 (10)

$$ASIR_t = \frac{SIR_t}{AV\_SIR\_PAST} \tag{11}$$

We report the descriptive statistics of SIR,  $ASIR_{t-1}$ ,  $ASIR_t$ , and  $ASIR_{t+1}$  in Table 3, together with those of the other variables. Deals with connected and unconnected fund holdings exhibit no significant differences in either their short-interest ratio and/or abnormal short-selling ratio around the month of the acquisition announcement.

To evaluate the potential effects of connected fund holdings on abnormal short selling of acquirers' stock, we regress  $ASIR_{t-1}$ ,  $ASIR_t$ , and  $ASIR_{t+1}$  on the connected dummy (holdings of connected funds) and other controls as in Equation (5). Our connection measure and connected fund ownership exhibit a negative relation with all the measures of ASIR (Table 14), however, the statistical support for the relation is weak, with only the effect of connected hedge fund holdings in the target on the abnormal short selling interest of the acquirer during the month of the announcement being marginally significant. Still, this result suggests that deals with an 'indirect toehold' of an acquirer in a target via connected hedge funds are seen by the market participants as more beneficial for the acquirer, thereby mitigating incentives to short-sell its shares.

[Table 14 in here]

## 7.3 Post-merger performance

We now consider certain longer term implications for the bidder, focusing on the post-merger performance of the merged firm. Bodnaruk et al. (2009) document a lower post-merger profitability for mergers in which the bidder's advisor has a stake in the target. Could connected fund holdings in the target similarly lead to poor performance of the merged firm? To answer this question, we use three measures to assess the post-merger performance of the firm: (1) the return on assets (ROA), (2) the return on equity (ROE), and (3) the net profit margin, measured by the ratio of net income to net sales (NPM). We regress these profitability measures, computed at the end of the first fiscal year following the acquisition announcement, on connected funds' holdings and other controls, as in Equation (5), for completed deals only. Table 15 reveals no significant impact of connected hedge funds' holdings on the merged firm's future profitability, results which contrast with Bodnaruk et al. (2009)'s findings for equity held directly by a deal's advisors.

[Table 15 in here]

# 8 Robustness

## 8.1 Propensity score matching

In this section, we use a propensity score matching technique to control for other possible (unobserved) differences between deals with and without connected fund holdings. We examine completion, premium, and abnormal returns for deals with connected fund holdings compared with a matched control sample of deals where such holdings are absent.

The first-stage probit regression relates the probability of having connected fund holdings to a set of explanatory variables, including: the book-to-market value of both the target and acquirer, acquirer size, the asset size ratio of the target to the acquirer, the ratio of deal value to acquirer market capitalisation, mutual fund holdings, percentage of the payment made in cash, a dummy indicating if the target and the acquirer are from different industries, and the total hedge fund holdings. Deals with connected fund holdings and other deals are matched using one-to-one matching without replacement based on the estimated propensity score. We retain only those matches for which the differences in the scores are smaller than 0.005, resulting in a total of 24 matched pairs.

The results in Panel A of Table 16 show that the resulting treated and control groups are indistinguishable in terms of virtually all characteristics used as the basis for matching. In Panel B of Table 16 we compare the differences across the two groups of deals in terms of the likelihood of deal completion, premium paid, as well as the abnormal returns of both target and acquirer on the announcement day, and their cumulative abnormal returns over another three windows [-1,1], [-3,3], and [-5,5]. Deals with connected fund holdings have significantly lower premiums and smaller target abnormal returns in all windows. There is no evidence of significant differences in acquirer abnormal returns between these two deal groups. The effect on the completion probability cannot be assessed, since our strict matching approach leads to having only completed deals in the paired sample. Overall, the matching results support our central conclusion: the pattern of information flow emanates from hedge funds that hold the target, and is transmitted through their prime brokers acting as deal advisors, leading to improved deal outcomes for the bidder.

## [Table 16 in here]

# 8.2 Pseudo hedge fund-prime broker connections

One potential concern in our analysis could be the endogeneity of hedge fund-prime broker connections. To address this issue, in the spirit of instrumental variable estimation, we construct estimated connections between hedge funds and prime brokers. Then we define a pseudo-relationship between hedge fund companies and prime brokers and proceed to repeat the analysis using such instrumented connections instead of the actual ones.

For each connected advisor in our sample, we estimate a probit regression for the probability that a hedge fund has this advisor as its prime broker. The dependent variable is a dummy indicating the use of this advisor as a prime broker at the hedge fund level. We use hedge fund size, domicile, and strategy as explanatory variables. In total, we have 2,309 hedge funds in our sample. In the next step, we predict the hedge fund connection to each advisor. We say a hedge fund is estimated to be connected with a given advisor if the probability of such connection is above the 70th percentile for that advisor. Hence, each hedge fund may have multiple estimated connected advisors. We then aggregate such individual fund level pseudo-connections at a company level to use together with the holdings information. This yields 518 deals with pseudo-connected fund holdings (as compared to 421 truly connected deals in the main sample), and the average holdings of such pseudo connected funds in the targets are 2.6% (comparable to the 1.8% holdings by hedge funds truly connected with heir actual prime brokers). We then use this pseudo-relationship to measure connected hedge fund holdings in the target firm.

The complete set of results is reported in the online Appendix, Tables G1 to G4. We find that the advisor's pseudo-connection to hedge funds significantly increases the likelihood of the advisor being selected. A firm is also more likely to be chosen as a target if it has pseudo-connected hedge fund holdings. Pseudo-connected funds significantly decrease their holdings in targets before and after the deal's announcement, and in bidders after completion. The pseudo-connected hedge fund holdings significantly reduce the target premium, reduce target abnormal returns, and increase bidder abnormal returns for targets with higher IA. All these results are consistent with the information flow patterns under the 'indirect toehold' scenario.

# 9 Conclusion

This paper analyses the potential channels of information flow between bidders, advisors, and their connected hedge funds and its impact on the choice of the deal advisor, target, and the final deal outcome in M&As. We define connected hedge funds as those that hold equity in the target firm before an M&A announcement while having a prime broker who serves as the bidder's advisor on the M&A deal. Using a sample of 931 US public M&A transactions between 2000 to 2019, we find that advisors with connected hedge fund holdings in a target are more likely to be employed to facilitate the M&A deal. Two pathways lead to this relation. On the one hand, having a particular target on its radar, a bidder is more likely to select a connected advisor. On the other hand, once selected, an advisor is also more likely to recommend a connected target. The connected hedge fund holdings in a target are positively associated with the likelihood of deal completion, but they lead to a lower premium and lower target abnormal returns around the announcement, especially for targets characterised by high levels of information asymmetry.

These findings are consistent with an 'indirect toehold' information flow mechanism.

Acquirers appear to choose advisors connected to hedge funds that hold the target to obtain an 'indirect toehold' in target firms. To justify their fees and increase the likelihood of fostering a profitable future relationship, advisors possess incentives to help the bidder. They are also motivated to exploit any private information obtained from their affiliated funds with holdings in the target firm, thereby helping bidders to reduce information asymmetry to enhance their bargaining power during negotiations. This leads to a lower premium, as well as lower target abnormal returns upon public announcement of the deal.

Our evidence indicates that an affiliated hedge fund is more likely to share information with its prime broker when the target is of diminished importance in its overall fund portfolio, thereby limiting any potential losses to these hedge funds arising from lower announcement returns. Hedge funds are also more likely to share information if maintaining strong prime-brokerage relations with a specific advisor is more important to the fund. This situation arises when the advisor is the single or dominant prime broker for a hedge fund company, or when hedge funds experience outflows and become more reliant on prime brokerage support to finance their activities. The effects of the 'indirect toehold' are more pronounced when the acquisition of the relevant information is of greater importance for the bidder. This happens when multiple bidders compete for the deal, when the bidder and target come from different industries, and in an economic environment characterised by a merger wave in the target-acquirer industry pair.

Our findings contribute to research on information sharing between prime brokers and their clients (Chung and Kang, 2016; Kumar et al., 2020; Qian and Zhong, 2018), as well as to the literature showing that financial advisors reduce information asymmetry between targets and acquirers (Officer, 2007; Leledakis et al., 2021). We highlight one particular channel through which such a reduction can be achieved, namely utilising an 'indirect toehold' through connected hedge funds. Overall, our analysis provides novel insights into the role of advisors and their connections to other financial institutions in M&A outcomes.

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The figure depicts the possible directions of information flows between target firms, hedge funds, investment banks, and acquiring firms in M&A deals.

Figure 1: The information flows in M&A deals.

# Tables

# Table 1: Predicted directions of the effects of the information flows

The table summarises the predicted directions of the effects of the information flows between acquirers, advisors, connected hedge funds, and targets on different characteristics of M&A deals under the two scenarios of indirect toehold and information advantage.

	Indirect Toehold	Information Advantage
Probability to choose a connected advisor	7	$\searrow$
Probability to choose a target with connected fund holdings	7	$\searrow$
Deal completion probability	~	$\nearrow$
Premium	$\searrow$	$\nearrow$
Target announcement abnormal return	$\searrow$	$\nearrow$
Acquirer announcement abnormal return	7	$\searrow$
Pre-announcement hedge fund holdings	$\searrow$ or =	$\nearrow$

# Table 2: Variable definitions

# This table defines and/or describes the variables used in this paper in alphabetical order.

Variables	Description
Abnormal_fees	The difference between the percentage fees and the average percentage fees for the two deals with the closest deal size in the same
	industry over the past two years.
ACAR	Acquirer cumulative abnormal returns over event windows of [0], [-1,1], [-3,3], [-5,5], expressed in decimals.
Acquisition times	The number of times an advisor serves as an acquirer's advisor one year before the acquisition announcement.
Acquisition value	The logarithm of the total value of all acquisitions in which an advisor serves as an acquirer's advisor one year before the acquisition announcement.
Activism	A dummy variable equal to 1 if any type of shareholder activism is reported via form 13D within 5 years before the deal announcement.
Amihud	The average Amihud illiquidity measure in the year prior to the acquisition announcement.
ASIR	The abnormal short interest for acquirers in the previous, current, and month following in the acquisition announcement.
B/M	The book-to-market value of equity of a target or acquirer measured at the end of the last fiscal year before the acquisition announcement.
Chosen	A dummy variable equal to 1 if an advisor is hired or a target is chosen for a particular deal and 0 otherwise.
Completion	A dummy variable equal to 1 if the deal is completed and 0 otherwise.
Connected	A dummy variable equal to 1 if an advisor is the prime broker of a hedge fund with holdings in the target firm and 0 otherwise.
	I ne variable can be computed at the fund level, advisor level, or a deal level. At the deal level, it takes a value of one
COVER	In any of the advisors are connected to the target via heage fund holdings.
Dool value	The number of analysis following the target in the year before the acquisition announcement.
Diff Ind	A dummy variable equal to 1 for a deal where bidder and terrate are from different 3-digit SIC code industries and 0 otherwise
DISP	The analyst forecast dispersion for the target in the year prior to the bid
EBB	The analysis forecast error for the target in the year before the accuisition announcement
Expertise	A dummy variable could to 1 if the advisor served as an acquirer's advisor in an acquisition that involved a target from the same two-digit
P	SIC industry as the target of the current acquisition and 0 otherwise.
Holding_acquirer	Hedge funds' holdings in the acquirer one quarter before the acquisition announcement.
Holding_connected	Holdings of connected hedge funds in a target firm one quarter before the acquisition announcement.
Holding_total	Holdings of all hedge funds in a target firm one quarter before the acquisition announcement.
Holding_MF	Mutual fund holdings in a target or acquirer firm one quarter before the acquisition announcement.
$\Delta$ Holding	Changes in holdings of each hedge fund in target or acquirer firms one quarter before or after the acquisition announcement.
IA	The target firm's information asymmetry measure based on five variables (Amihud, SPREAD, Size, COVER, ERR).
IMR	The Inverse Mills Ratio.
Insider trading	A dummy variable equal to 1 if there is insider trading in a deal and 0 otherwise.
Leverage	The equity-to-assets ratio of a target firm at the end of the last fiscal year before the acquisition announcement.
Hostile	A dummy variable equal to 1 for a hostile deal and 0 otherwise.
Merger of equals	A dummy variable equals to 1 when the target and acquirer consider their merger a merger of equals and 0 otherwise.
Merger_wave	A dummy variable equal to 1 if the dollar value of mergers in each target and acquirer industry pair in a year is above the 30th percentile.
NPM	The net profit margin of the new hrm at the end of the first fiscal year following the acquisition announcement.
Number of bidders	The number of bidders involved in a deal.
Peteteole	The fraction of the cash payment in the consideration.
P/F	The rate operation of the stock payment in the consideration.
Promium	The proce-carnings ratio in the year provide one acquisition announcement. Premium of offer prize to target closing prize one weak (four weaks) before the acquisition announcement
Prior advisor	A dummy variable equal to 1 if the advisor serves as a M&A advisor for the acquisition amountement.
1 1101 advisor	and 0 otherwise
RELSIZE	The ratio of the target's asset size to the acquirer's asset size at the end of the last fiscal year before the acquisition announcement.
ROA	The return on assets of the target at the end of the last fiscal year before the acquisition announcement.
ROE	The return on equity of the target at the end of the last fiscal year before the acquisition announcement.
Sales	The sales growth rate in the year prior to the acquisition announcement.
$\Delta$ Shares	Changes in shares of a hedge fund portfolio allocated to target or acquirer firms one quarter before or after the acquisition announcement.
SIR	The short interest ratio for an acquirer measured as the short selling in a month divided by the numbers of shares outstanding in the previous month.
Size	The logarithm of the book value of total assets in the year prior to the acquisition announcement.
SPREAD	The average bid-ask spread over the year prior to the acquisition announcement.
Tangible	The ratio of total tangible assets to total assets at the end of the last fiscal year before announcement.
TCAR	Target cumulative abnormal returns over event windows of [0], [-1,1], [-3,3], [-5,5], expressed in decimals.
Tender	A dummy variable equal to 1 for tender offers and 0 otherwise.
Termination fee	The amount of the termination fee paid by the acquirer in billions of US dollars.
Toehold	The percentage of target shares held by the acquirer 6 months before the acquisition announcement.
valpet Valatilita	The ratio of deal value to acquirer market capitalization at the end of the last fiscal year before the acquisition announcement.
volatility	The return volume of the target over the year prior to the acquisition announcement.

#### Table 3: Descriptive statistics of deal characteristics

This table reports the descriptive statistics of deal characteristics according to whether the deal involves connected hedge fund holdings in the target firm. We define a fund to be a connected fund if the advisory bank in the deal is the prime broker of a hedge fund holding equity in the target. *Holding\_connected* (*Holding\_unconnected*) represents the holdings of connected (unconnected) hedge funds in a target firm one quarter prior to the acquisition announcement. *Premium* is the premium paid one week (four weeks) before the acquisition announcement. *TCAR* and *ACAR* are the cumulative abnormal returns on target and acquirer stocks on the event date and over a window of [-1,1], [-3,3], and [-5,5], respectively. Other variables are summarized in Table 2. We conduct a t-test for differences in means between deals with and without connected fund holdings. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

Deals with connected fund holdings						Deals without connected fund holdings							
	Mean	Median	SD	Min.	Max.	Ν	Mean	Median	SD	Min.	Max.	N	t-test
Holdings_connected	0.018	0.010	0.022	0.000	0.106	421	0.000	0.000	0.000	0.000	0.000	510	18.720***
Holdings_unconnected	0.119	0.100	0.082	0.000	0.566	421	0.113	0.090	0.094	0.000	0.621	510	1.035
Holdings_acquirer	0.101	0.088	0.068	0.000	0.357	421	0.085	0.077	0.062	0.000	0.357	510	$3.609^{***}$
Completion	0.867	1.000	0.340	0.000	1.000	421	0.878	1.000	0.327	0.000	1.000	510	-0.522
Premium (one week)	0.370	0.301	0.367	-0.847	2.605	421	0.392	0.320	0.413	-0.507	3.231	510	-0.827
Premium (four weeks)	0.387	0.317	0.352	-0.864	2.313	421	0.435	0.314	0.497	-0.573	4.286	510	-1.652*
TCAR	0.174	0.107	0.227	-0.197	1.609	421	0.199	0.114	0.278	-0.197	1.609	510	-1.458
TCAR[-1,1]	0.246	0.203	0.245	-0.215	1.766	421	0.285	0.222	0.306	-0.254	1.766	510	-2.112**
TCAR[-3,3]	0.254	0.217	0.249	-0.260	1.707	421	0.288	0.223	0.308	-0.296	1.707	510	-1.796*
TCAR[-5,5]	0.262	0.223	0.254	-0.285	1.795	421	0.301	0.242	0.323	-0.285	1.795	510	-2.001**
ACAR	-0.014	-0.006	0.060	-0.199	0.186	421	-0.005	-0.003	0.042	-0.199	0.186	510	-2.879***
ACAR[-1,1]	-0.012	-0.008	0.075	-0.226	0.257	421	-0.009	-0.009	0.060	-0.226	0.257	510	-0.730
ACAR[-3,3]	-0.015	-0.008	0.084	-0.261	0.277	421	-0.009	-0.009	0.065	-0.261	0.277	510	-1.266
ACAR[-5,5]	-0.016	-0.009	0.089	-0.299	0.272	421	-0.008	-0.008	0.076	-0.299	0.272	510	-1.485
Toehold	0.389	0.000	3.835	0.000	47.060	421	0.305	0.000	2.649	0.000	41.000	510	0.391
ROA_t	-0.003	0.007	0.047	-0.407	0.083	421	-0.017	0.002	0.059	-0.407	0.083	510	4.013***
Leverage_t	0.420	0.420	0.283	-0.616	0.962	421	0.367	0.310	0.308	-0.616	0.962	510	$2.711^{***}$
B/M_t	0.499	0.426	0.436	-1.042	2.807	421	0.671	0.637	0.487	-1.042	2.807	510	-5.650***
Tangible_t	0.802	0.876	0.212	0.127	1.000	421	0.891	0.975	0.166	0.249	1.000	510	-7.171***
Size_a	8.872	8.721	1.710	3.082	12.434	421	7.692	7.367	2.055	3.082	12.434	510	9.401***
B/M_a	0.265	0.357	3.090	-62.585	1.707	421	0.530	0.486	0.335	-0.236	2.593	510	-1.928*
RELSIZE	0.533	0.264	1.059	0.000	9.338	421	0.373	0.150	0.831	0.000	9.338	510	2.581**
Valpct	0.580	0.319	0.889	0.001	8.126	421	0.337	0.152	0.608	0.001	8.126	510	$4.939^{***}$
Holding_MF	0.128	0.000	0.168	0.000	0.551	421	0.091	0.024	0.128	0.000	0.551	510	$3.827^{***}$
Pctcash	0.619	0.732	0.402	0.000	1.000	421	0.538	0.514	0.439	0.000	1.000	510	$2.933^{***}$
Hostile	0.021	0.000	0.145	0.000	1.000	421	0.012	0.000	0.108	0.000	1.000	510	1.159
Diff_Ind	0.285	0.000	0.452	0.000	1.000	421	0.290	0.000	0.454	0.000	1.000	510	-0.173
Merger of equals	0.029	0.000	0.167	0.000	1.000	421	0.012	0.000	0.108	0.000	1.000	510	$1.848^{*}$
Tender	0.188	0.000	0.391	0.000	1.000	421	0.169	0.000	0.375	0.000	1.000	510	0.756
Deal value (\$B)	6.204	1.981	12.215	0.012	69.770	421	0.813	0.247	2.288	0.010	35.274	510	9.763***
Termination fee (\$B)	0.099	0.000	0.299	0.000	2.100	421	0.012	0.000	0.101	0.000	2.100	510	6.174***
IA	3.261	3.000	2.217	0.000	7.000	421	4.896	5.000	1.872	0.000	7.000	510	$-12.197^{***}$
Activism	0.017	0.000	0.128	0.000	1.000	421	0.022	0.000	0.145	0.000	1.000	510	-0.545
Number of bidders	1.095	1.000	0.317	1.000	3.000	421	1.082	1.000	0.339	1.000	4.000	510	0.584
Number of advisors	1.834	1.000	1.317	1.000	11.000	421	0.769	1.000	0.582	0.000	3.000	510	16.424***
Number of connected HFs	5.095	3.000	5.264	1.000	37.000	421	0.000	0.000	0.000	0.000	0.000	510	21.859***
Number of unconnected HFs	21.525	18.000	14.064	0.000	88.000	421	9.939	7.000	9.128	1.000	70.000	510	$15.139^{***}$
$SIR_t$	0.051	0.030	0.073	0.000	0.975	421	0.059	0.028	0.210	0.000	3.739	510	-0.690
$ASIR_{t-1}$	1.188	1.047	0.765	0.000	8.662	421	1.208	1.065	1.359	0.000	22.288	510	-0.255
$ASIR_t$	1.040	0.986	0.608	0.000	9.317	421	1.054	0.969	0.915	0.000	12.579	510	-0.263
$ASIR_{t+1}$	1.522	1.124	1.927	0.000	33.777	421	1.654	1.119	4.235	0.000	84.267	510	-0.578

## Table 4: Choice of the advisor

This table reports the results from Equation (1), examining the acquirer's choice of advisors in M&As. The dependent variable is a dummy variable that equals one if an advisor is hired by the acquirer for the deal and zero otherwise. *Connected* is a dummy variable that equals one if an advisor is the prime broker of a hedge fund with holdings in the target firm, and zero otherwise. *Holding\_connected* is the percentage holdings of an advisor's connected hedge funds in the target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	0.50***	
	(28.94)	
Holding_connected		$1.43^{**}$
		(2.54)
Acquisition times	0.03***	0.06***
	(5.02)	(6.28)
Acquisition value	-0.00	-0.00
	(-0.78)	(-0.60)
Prior advisor	1.07***	1.12***
	(4.41)	(4.60)
Expertise	0.22**	0.21**
	(2.22)	(2.43)
IMR_holding	0.00	-0.00
	(0.01)	(-0.23)
Activism	-0.03	-0.03
	(-0.15)	(-0.15)
Constant	-2.85***	-3.04***
	(-14.27)	(-9.90)
Pseudo R-sq	0.12	0.10
Number of deals	897	897
Observations	44776	44776
Industry, Year FE	Yes	Yes

#### Table 5: Choice of the target

This table reports the results from Equation (3), examining the acquirer's choice of targets in M&As. The dependent variable is a dummy variable that equals one if a firm is chosen to be the target and zero otherwise. *Connected* is a dummy variable that equals one if a firm is held by hedge funds whose prime broker is the advisor for the deal, and zero otherwise. *Holding\_connected* is the percentage holdings of an advisor's connected hedge funds in the firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	$0.96^{***}$	
	(8.05)	
Holding_connected		12.78***
		(7.94)
Size	-0.07***	0.02***
	(-5.63)	(4.95)
B/M	-0.00***	-0.00***
	(-4.61)	(-3.42)
ROE	0.01***	0.01***
	(5.34)	(3.97)
Leverage	0.10	0.09
	(1.50)	(1.29)
Tangible	-0.07	-0.05
	(-1.16)	(-0.79)
Liquidity	-0.01**	-0.01*
	(-2.05)	(-1.72)
Sales	0.00	0.00
	(0.28)	(0.27)
P/E	-0.00	-0.00
	(-0.64)	(-0.19)
IMR_holding	$0.00^{***}$	0.00
	(4.05)	(1.55)
IMR_bigbank	-0.00***	-0.00
	(-7.48)	(-1.15)
Activism	-0.02	-0.03
	(-0.25)	(-1.13)
Constant	-0.58*	-0.84***
	(-1.90)	(-6.69)
Pseudo R-sq	0.06	0.03
Number of deals	658	658
Observations	3592	3592
Industry, Year, Advisor FE	Yes	Yes

#### Table 6: Changes in hedge fund holdings

This table reports the results from Equation (4) for the changes in the hedge fund holdings in a target or acquirer and the changes in shares of the target or acquirer in the hedge fund portfolio. Panel A reports the results for the changes in target holdings/shares one quarter before (t-1) and one quarter after (t+1) the deal announcement. Panel B reports similar results for holdings/shares in bidders. Panel C reports the changes in implied holdings/shares in bidder from one quarter before the deal announcement to deal completion (denoted by q), and during the first quarter after the completion (denoted by q + 1). Connected is a dummy variable that equals one if a hedge fund's prime broker is also the advisory bank in a deal, and zero otherwise. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Changes in holdings/shares in target around announcement										
	(1)	(2)	(3)	(4)						
	$\Delta Holding_{t-1}$	$\Delta Holding_{t+1}$	$\Delta Shares_{t-1}$	$\Delta Shares_{t+1}$						
Connected	0.00	0.01	0.04	0.02						
	(0.13)	(0.48)	(1.22)	(0.46)						
Constant	-0.05	-0.55	-0.07	-0.02						
	(-0.48)	(-1.64)	(-1.40)	(-0.16)						
Adjusted R-sq	0.05	0.20	0.27	0.33						
Number of deals	931	641	931	641						
Observations	32327	24037	32327	24037						
Deal and Fund FE	Yes	Yes	Yes	Yes						

Panel B: Changes in holdings/shares in bidder around announcement

	$\Delta Holding_{t-1}$	$\Delta Holding_{t+1}$	$\Delta Shares_{t-1}$	$\Delta Shares_{t+1}$
Connected	-0.01	0.01	0.01	-0.01
	(-1.48)	(1.14)	(0.57)	(-0.16)
Constant	0.05	-0.05	-0.00	0.00
	(0.88)	(-0.60)	(-0.15)	(0.06)
Adjusted R-sq	0.03	0.04	0.15	0.10
Number of deals	895	615	895	615
Observations	53578	32164	53578	32164
Deal and Fund FE	Yes	Yes	Yes	Yes

Panel C: Changes in holdings/shares in bidder after completion

	$\Delta Holding_q$	$\Delta Holding_{q+1}$	$\Delta Shares_q$	$\Delta Shares_{q+1}$
Connected	-0.016***	-0.002	-0.067**	0.004
	(-2.966)	(-0.584)	(-2.149)	(0.225)
Constant	-0.034	$0.026^{**}$	-0.065**	$0.031^{**}$
	(-1.397)	(2.399)	(-2.189)	(2.192)
Adjusted R-sq	0.05	0.03	0.07	0.05
Number of deals	812	812	812	812
Observations	88745	88745	85378	88745
Deal and Fund FE	Yes	Yes	Yes	Yes

#### Table 7: Target premium and abnormal returns

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium and abnormal returns. *Premium* is the premium paid one week before the announcement. TCAR and ACAR are the target and acquirer abnormal returns on the acquisition announcement date. *Connected* is a dummy variable that equals one if a target is held by any hedge funds whose prime broker is also the advisory bank in a deal, and zero otherwise. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	$(\mathbf{n})$	(2)	(4)	(5)	(6)
	(1)	(2)	(3)	(4)	(5)	(0)
	Pren	num	TC	АК	AC	АК
Connected	-0.09***		-0.07**		-0.01	
TT 11 1	(-4.89)	0.50	(-2.89)	0.55	(-1.15)	0.10
Holding_connected		-0.58		-0.57		0.13
		(-0.55)		(-1.58)		(0.88)
Holding_total	-0.31**	-0.31*	-0.20	-0.20	0.03	0.02
	(-2.65)	(-2.10)	(-1.61)	(-1.69)	(1.19)	(0.84)
Holding_acquirer	0.10	0.07	0.12	0.10	-0.02	-0.02
	(0.64)	(0.46)	(1.03)	(0.75)	(-0.33)	(-0.39)
Toehold	-0.00**	-0.00*	-0.00	0.00	0.00	0.00
	(-2.32)	(-1.89)	(-0.04)	(0.05)	(0.78)	(0.69)
ROA_t	-1.23***	-1.29***	-0.50***	-0.55***	0.05	0.04
	(-9.27)	(-10.10)	(-4.65)	(-5.80)	(0.69)	(0.73)
Leverage_t	-0.00	-0.00	-0.00	-0.00	0.01	0.01
	(-0.09)	(-0.02)	(-0.10)	(-0.04)	(1.13)	(1.06)
B/M_t	$0.06^{**}$	$0.06^{**}$	0.03	0.02	-0.01**	-0.01**
	(2.72)	(2.64)	(1.17)	(1.08)	(-2.83)	(-2.97)
Size_a	$0.04^{**}$	$0.03^{**}$	$0.03^{***}$	$0.03^{***}$	-0.00	-0.00
	(2.80)	(2.42)	(6.13)	(7.37)	(-0.55)	(-1.17)
B/M_a	0.00	0.00	-0.00	0.00	-0.00**	-0.00**
	(0.21)	(0.39)	(-0.19)	(0.06)	(-2.59)	(-2.72)
Tangible_t	0.08	0.08	0.07**	0.08**	-0.00	-0.00
	(0.88)	(0.92)	(2.69)	(2.81)	(-0.15)	(-0.10)
RELSIZE	-0.02	-0.02	-0.01	-0.01	-0.00	-0.00
	(-0.95)	(-1.05)	(-1.43)	(-1.57)	(-1.01)	(-1.07)
Valpct	0.03	0.02	0.02	0.01	0.00	0.00
-	(1.30)	(1.06)	(1.44)	(1.21)	(0.23)	(0.06)
MFhold	-0.18**	-0.18**	-0.08	-0.08	-0.02	-0.02
	(-2.39)	(-2.46)	(-0.81)	(-0.84)	(-0.60)	(-0.61)
Pctcash	-0.06	-0.06	-0.00	0.00	0.02***	0.02***
	(-1.06)	(-1.03)	(-0.08)	(0.00)	(4.13)	(4.19)
Hostile	0.08	0.08	0.03	0.03	0.01	0.01
	(0.78)	(0.79)	(0.70)	(0.75)	(0.55)	(0.58)
Diff_Ind	0.00	0.01	0.01	0.02	0.00	0.00
	(0.24)	(0.47)	(0.60)	(0.76)	(0.01)	(0.21)
Merger of equals	-0.12	-0.13*	-0.07	-0.08	-0.01	-0.01
0 1	(-1.85)	(-1.98)	(-1.62)	(-1.78)	(-0.50)	(-0.57)
Tender	0.03	0.03	-0.01	-0.01	0.00	0.00
	(0.55)	(0.62)	(-0.35)	(-0.26)	(0.50)	(0.66)
Number of bidders	0.13**	0.13**	-0.01	-0.01	0.00	0.00
	(2.64)	(2.77)	(-0.34)	(-0.33)	(0.62)	(0.58)
IMR holding	-0.01	-0.01	-0.00	-0.00	0.00***	0.00***
g	(-1, 74)	(-1.75)	(-0.88)	(-0.83)	(3.42)	(3.53)
IMB bigbank	0.00**	0.00	0.00	0.00	0.00	-0.00
10110-01804111	(2.46)	(1.76)	(1.37)	(0.84)	(0.21)	(-1.59)
Activism	0.16	0.17	-0.01	-0.00	-0.02	-0.02
	(1.41)	(1.45)	(-0.15)	(-0.03)	(-0.70)	(-0.69)
Constant	_0.01	_0.01	_0.05	_0.06	_0.04	-0.03
Constant	(-0.01)	-0.01 (-0.06)	-0.00	-0.00 (_1.04)	(_1 43)	(_1 31)
Adjusted B-sc	0.15	0.14	0.12	0.12	0.09	0.07
Number of deals	807	807	806	806	803	803
Industry Vear Advisor FE	Ves	Ves	Ves	Ves	Ves	Ves
maasay, roa, navisor rin	100	100	100	100	100	100

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#### Table 8: Target premium and abnormal returns: information asymmetry

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium and abnormal returns moderated by the information asymmetry of targets. *Premium* is the premium paid one week before the announcement. *TCAR* and *ACAR* are the cumulative abnormal returns on target and acquirer over an event window of [0], [-1,1], and [-5,5], respectively. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. *highIA* equals to one for high information asymmetry targets, and zero otherwise. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	-
	Premium	TCÁR	TCAR[-1,1]	TCAR[-5,5]	ACÁR	ACAR[-1,1]	ACAR[-5,5]	
Holding_connected $\times$ highIA	-3.10***	-2.04***	-2.15***	-2.58***	0.35	0.44	0.56	-
0 0	(-5.95)	(-4.79)	(-5.68)	(-5.32)	(0.86)	(1.00)	(0.94)	
Holding_connected	-0.02	-0.10	0.27	0.16	0.04	0.09	0.18	
	(-0.02)	(-0.37)	(0.33)	(0.18)	(0.30)	(0.55)	(1.30)	
highIA	0.16***	0.07**	0.12***	0.11***	0.02	0.01	0.02	
0	(6.08)	(2.40)	(4.40)	(3.56)	(1.71)	(0.95)	(1.32)	
Holding total × highIA	-0.45**	-0.04	-0.12	-0.12	-0.06	-0.07	-0.12	
monani <u>g-</u> tottal // mgmin	(-3.10)	(-0.31)	(-0.65)	(-0.61)	(-1.19)	(-0.94)	(-1.50)	
Holding total	-0.13	-0.17	-0 19***	-0.21***	0.04*	0.05	0.06**	
fiolding_total	(-1.09)	(-1.56)	(-3.79)	(-3.96)	(2.00)	(1.69)	(2.32)	
Holding acquirer	0.04	0.08	0.04	0.04	-0.02	0.05	0.04	
Holding_acquirer	(0.28)	(0.86)	(0.30)	(0.20)	(0.47)	(0.71)	(0.47)	
Tophold	0.20)	0.00	(0.55)	0.00	0.00	0.00	0.00	
Toenoid	-0.00	(0.10)	-0.00	(0.74)	(1.00)	-0.00	-0.00	
DOA +	(-1.00)	(0.12)	(-1.21)	(-0.74) 0.65***	(1.09)	(-0.04)	(-0.57)	
nOA_t	-1.14	-0.47	-0.02	-0.03	(0.07)	(0.01	(1.12)	
T	(-9.58)	(-0.30)	(-0.04)	(-8.03)	(0.97)	(0.20)	(1.13)	
Leverage_t	0.02	0.01	0.01	-0.00	0.01	-0.00	-0.02	
D/M	(0.43)	(0.14)	(0.35)	(-0.06)	(1.12)	(-0.29)	(-1.14)	
B/M_t	0.05*	0.02	-0.00	-0.00	-0.01**	-0.01	-0.01	
	(2.23)	(0.84)	(-0.24)	(-0.13)	(-2.59)	(-1.03)	(-1.29)	
Size_a	0.04**	$0.03^{***}$	0.04***	$0.04^{***}$	-0.00	0.00	0.00	
	(2.79)	(6.51)	(8.34)	(6.26)	(-0.59)	(0.84)	(0.07)	
B/M_a	0.00	0.00	$0.00^{**}$	$0.00^{**}$	-0.00**	0.00	0.00	
	(0.57)	(0.11)	(2.40)	(2.56)	(-2.72)	(0.42)	(0.27)	
Tangible_t	0.08	$0.07^{**}$	$0.08^{**}$	$0.07^{***}$	-0.00	-0.02	-0.01	
	(0.96)	(2.62)	(2.95)	(3.36)	(-0.16)	(-0.65)	(-0.22)	
RELSIZE	-0.02	-0.01	-0.00	-0.01	-0.00	-0.01	-0.01	
	(-1.11)	(-1.52)	(-0.45)	(-1.00)	(-1.07)	(-1.00)	(-1.23)	
Valpct	0.03*	0.02*	0.01	0.02	0.00	0.01	0.00	
*	(2.10)	(2.28)	(1.02)	(1.01)	(0.41)	(1.32)	(0.44)	
MFhold	-0.16*	-0.07	-0.09	-0.12*	-0.02	-0.01	-0.00	
	(-2.16)	(-0.72)	(-1.01)	(-2.10)	(-0.49)	(-0.47)	(-0.14)	
Peteash	-0.07	-0.00	0.03	0.03	0.02***	0.02**	0.02*	
receasi	(-1.16)	(-0.09)	(0.93)	(1.02)	(3.84)	(3.01)	(2.03)	
Hostile	0.09	0.03	0.09	0.07	0.01	0.01	0.01	
Hostile	(0.88)	(0.74)	(1.38)	(1.34)	(0.70)	(0.55)	(0.44)	
Diff Ind	(0.88)	0.02	(1.55)	(1.54)	0.00	(0.00)	0.01	
Diii_iiid	(0.40)	(0.02)	(0.26)	-0.00	-0.00	(0.46)	-0.01	
Monmon of occupie	(0.40)	(0.73)	(-0.30)	(-0.32)	(-0.20)	(-0.40)	(-1.70)	
merger or equals	-0.12	-0.07 (1 EE)	-0.00	-0.10 (1.75)	-0.01	0.00	-0.02	
<b>T</b> 1	(-1.08)	(-1.55)	(-0.67)	(-1.75)	(-0.38)	(0.03)	(-1.19)	
render	0.03	-0.01	0.01	0.01	(0.77)	0.00	0.00	
	(0.65)	(-0.30)	(0.23)	(0.27)	(0.77)	(0.07)	(0.39)	
Number of bidders	0.12**	-0.01	-0.05*	-0.00	0.00	0.01	0.01	
	(2.73)	(-0.49)	(-2.03)	(-0.12)	(0.59)	(0.70)	(0.94)	
IMR_holding	-0.01	-0.00	-0.00	-0.00	0.00**	0.00	0.00	
	(-1.80)	(-0.93)	(-1.40)	(-1.45)	(3.26)	(1.12)	(1.33)	
IMR_bigbank	0.00	0.00	$0.00^{*}$	0.00**	-0.00*	-0.00	-0.00	
	(1.67)	(0.87)	(2.28)	(2.59)	(-1.90)	(-0.32)	(-0.49)	
Activism	0.19	0.01	-0.01	-0.02	-0.02	-0.03*	-0.01	
	(1.68)	(0.16)	(-0.18)	(-0.22)	(-0.81)	(-2.04)	(-0.63)	
Constant	-0.11	-0.10	-0.03	-0.08	-0.05	-0.05	-0.07	
	(-0.45)	(-1.58)	(-0.41)	(-0.76)	(-1.62)	(-1.08)	(-1.13)	
Adjusted R-sq	0.15	0.13	0.23	0.22	0.08	0.11	0.07	$^{-}58$
Number of deals	897	896	896	896	893	893	893	00
Industry, Year, Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Table 9: Premium and abnormal returns: target importance for hedge funds

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium (*Premium*) and abnormal returns of target (*TCAR*) and bidder (*ACAR*), controlling for target importance for hedge funds. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. *highIA* equals to one for high information asymmetry targets, and zero otherwise. *Holding\_connected\_lowshare* is holdings of hedge funds for which holdings in targets are below the 30th percentile. *Holding\_connected\_lowsic* is holdings of hedge funds for which holdings in the target industry are below the 30th percentile. *Holding\_connected\_shortperiod* is holdings of hedge funds that hold targets for only one quarter. We use all the other controls as in Table 7, which are not reported for the sake of space. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

								_
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
	Premium	TCAR	TCAR[-1,1]	TCAR[-5,5]	ACAR	ACAR[-1,1]	ACAR[-5,5]	-
E	and A. Low	tongot chon	o in hodge fun	d nortfolio				
Holding connected lowshare × highIA	-3.52	_1 05	-0.17	-2.17	1.55	1.35	1.30	-
fiolding_connected_lowshare × ingin/r	(-0.27)	(-0.28)	(-0.03)	(-0.31)	(1.94)	(1.11)	(0.34)	
Holding connected lowshare	-7.45	-1.12	-4.20	-5.69	-1.49	-1.62	-2.08	
	(-0.75)	(-0.22)	(-0.92)	(-1.11)	(-1.06)	(-0.81)	(-0.44)	
Holding_connected	-0.22	-0.53	0.01	-0.08	0.14	0.24	0.37	
0	(-0.20)	(-1.37)	(0.02)	(-0.09)	(0.88)	(1.12)	(1.73)	
highIA	0.05	0.05	0.09**	0.07*	0.02**	0.01	0.01*	
-	(1.30)	(1.36)	(2.95)	(2.25)	(3.25)	(1.65)	(2.00)	
Holding_total_lowshare $\times$ highIA	1.60	0.49	0.52	0.58	-0.18	-0.31*	-0.34	
	(0.93)	(0.46)	(0.44)	(0.48)	(-1.48)	(-1.99)	(-1.52)	
Holdings_total_lowshare	0.39	-0.58	0.64	0.93	0.10	0.18	0.13	
	(0.68)	(-1.26)	(0.96)	(1.42)	(0.69)	(1.18)	(0.61)	
Holding_total	-0.36**	-0.16	-0.28**	-0.32**	0.02	0.02	0.01	
	(-2.37)	(-1.37)	(-2.33)	(-3.00)	(1.12)	(0.59)	(0.36)	
Constant	-0.06	-0.07	-0.03	-0.09	-0.05*	-0.05	-0.06	
	(-0.28)	(-0.96)	(-0.48)	(-0.98)	(-1.87)	(-1.31)	(-1.14)	_
Adjusted R-sq	0.15	0.13	0.23	0.23	0.08	0.11	0.07	_
_								
Pa	nel B: Low t	arget indust	try in hedge fu	nd portfolio				_
Holding_connected_lowsic $\times$ highlA	-6.65	-8.29***	-6.61*	-7.72**	-1.23	-0.53	-2.24*	
	(-1.58)	(-5.61)	(-2.29)	(-3.04)	(-1.53)	(-0.55)	(-2.11)	
Holding_connected_lowsic	3.77	7.69***	5.16**	5.49**	0.67	1.08	2.50***	
TT 11	(1.27)	(5.31)	(2.48)	(3.22)	(1.07)	(1.38)	(3.41)	
Holding_connected	-0.49	-0.80	-0.27	-0.44	0.15	0.14	0.23	
L:_LTA	(-0.45)	(-1.84)	(-0.29)	(-0.46)	(1.02)	(0.78)	(1.11)	
nigniA	(2.51)	(2.06)	(5.04)	(4.84)	(0.01	(1.92)	0.00	
Holding total lowgia × highIA	(3.51)	(2.06)	(5.94)	(4.84)	(2.39)	(1.23)	(0.48)	
Holding_total_lowsic × liightA	(0.24	-0.04	(0.57)	(0.68)	-0.00	-0.10	(1.12)	
Holding total lownin	(0.25)	(-0.00)	0.05	(0.08)	(-0.04)	(-0.85)	(1.12)	
Holding_total_lowsic	(0.41)	-0.10	-0.05	(0.12)	(0.04)	(0.55)	-0.02	
Holding total	-0.32*	-0.18	-0.24*	-0.27**	0.02	0.02	0.01	
fiolding_total	-0.32 (_2.27)	-0.18	-0.24 (-2.07)	-0.27	(0.02)	(0.61)	(0.15)	
Constant	-0.09	-0.12	-0.04	-0.10	-0.05*	-0.05	-0.06	
Constant	(-0.46)	(-1.50)	(-0.65)	(-1.12)	(-2.05)	(-1.26)	(-1.15)	
Adjusted B-sa	0.14	0.14	0.22	0.22	0.08	0.11	0.07	-
Trajabioa Te ba	0.11	0.11	0.22	0.22	0.00	0.11	0.01	-
Pan	el C: Short h	olding peri	od of target by	hedge funds				
Holding_connected_shortperiod × highIA	-32.57**	-29.96***	-27.30***	-20,19*	-0,46	1.86*	5.54*	-
	(-2.63)	(-3.86)	(-4.07)	(-2.07)	(-0.47)	(1.96)	(2.18)	
Holding_connected_shortperiod	3.75*	1.91	1.08	1.66	0.19	-0.04	-0.71**	
	(2.12)	(1.76)	(1.20)	(1.28)	(1.12)	(-0.08)	(-2.33)	
Holding_connected	-0.63	-0.44	0.04	-0.22	0.11	0.18	0.33	
-	(-0.55)	(-1.25)	(0.04)	(-0.23)	(0.73)	(0.82)	(1.33)	
highIA	0.10***	0.06*	0.10***	0.09***	$0.01^{*}$	0.01**	0.01*	
-	(4.25)	(2.07)	(9.60)	(6.60)	(2.08)	(2.74)	(2.08)	
Holding_total_shortperiod $\times$ highIA	-0.28	0.61	0.46	0.18	-0.11	-0.58	-0.95**	
· –	(-0.17)	(0.82)	(0.69)	(0.21)	(-0.58)	(-1.37)	(-2.58)	
Holding_total_shortperiod	-1.57	-1.60**	-1.88**	-2.05**	0.05	0.15	0.31	
	(-1.65)	(-2.37)	(-2.34)	(-2.71)	(0.40)	(1.03)	(1.62)	
Holding_total	-0.19	-0.09	-0.11	-0.12	0.02	0.03	0.01	
	(-1.23)	(-0.56)	(-0.81)	(-0.95)	(0.92)	(0.67)	(0.25)	<b>.</b> .
Constant	-0.10	-0.12*	-0.05	-0.10	-0.04	-0.04	-0.06	-59
	(-0.45)	(-1.99)	(-0.86)	(-1.10)	(-1.59)	(-1.09)	(-1.03)	_
Adjusted R-sq	0.15	0.15	0.24	0.23	0.08	0.11	0.07	
Number of deals	897	896	896	896	893	893	893	
Industry, Year, Advisor FE, Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	_

## Table 10: Premium and abnormal returns: importance of prime broker relations for hedge funds

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium (*Premium*) and abnormal returns of target (*TCAR*) and bidder (*ACAR*), controlling for the importance of the prime broker relationship for hedge funds. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. *highIA* equals to one for high information asymmetry targets, and zero otherwise. *Holding\_connected\_singlePB* is the holdings of hedge funds, which have a single prime broker. *Holding\_connected\_dominantPB* is the holdings of hedge funds, which have a prime broker servicing over 70% of the assets of a hedge fund company. We use all the other controls as in Table 7, which are not reported for the sake of space. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(2)	(4)	(5)	(6)	(7)			
	(1) Deceminant	(2)	()) TCAD[1,1]	(4) TCAD[EE]		(0)	(I)			
	1 Tellium	TOAN	10AN[-1,1]	10AR[-5,5]	ACAN	ACAN[-1,1]	ACAR[-5,5]			
Panel A. Hedge funds have a single prime broker										
Holding connected single PB $\times$ high IA	4 10**	1 73	ave a single pi	0.32	1 98***	0.88**	0 08***			
Holding_connected_singler D × hightA	-4.15 ( 2.52)	(0.04)	(0.87)	(0.32)	(5.27)	(2.41)	(8.30)			
Holding connected singlePR	(-2.32)	0.70	(-0.07)	(-0.23)	0.15	(2.41)	0.56			
Holding_connected_snigler D	(1 59)	(0.51)	-0.20	-0.30	(0.52)	(0.23	-0.50			
Holding connected	(1.58)	0.51)	(-0.24)	(-0.38)	(0.52)	(0.71)	(-1.23)			
Holding_connected	-0.77	-0.09	-0.04	-0.27	-0.02	0.07	(1.55)			
1. 1.7.4	(-0.81)	(-1.02)	(-0.03)	(-0.22)	(-0.17)	(0.34)	(1.55)			
nign1A	0.10	$(0.05^{\circ})$	(15.07)	0.09	(0.01	0.01	0.01			
	(5.96)	(2.08)	(15.97)	(9.94)	(2.31)	(1.77)	(0.98)			
Holding_total_singlePB $\times$ highIA	-0.46	0.10	-0.60**	-0.45**	-0.07	-0.04	-0.09			
	(-1.84)	(0.26)	(-2.43)	(-2.99)	(-1.07)	(-0.51)	(-0.55)			
Holding_total_singlePB	-0.16	0.23	0.40	0.29	0.06	0.01	0.11			
	(-0.44)	(0.59)	(1.38)	(1.39)	(1.48)	(0.15)	(1.18)			
Holding_total	$-0.24^{**}$	-0.23*	-0.26**	-0.27***	0.02	0.03	0.00			
	(-2.51)	(-2.25)	(-2.89)	(-3.39)	(0.75)	(0.65)	(0.12)			
Constant	-0.08	-0.08	-0.02	-0.07	-0.05	-0.05	-0.06			
	(-0.30)	(-1.30)	(-0.27)	(-0.63)	(-1.77)	(-1.20)	(-1.11)			
Adjusted R-sq	0.15	0.13	0.22	0.21	0.09	0.11	0.07			
Pane	el B: Hedge i	funds hav	e a dominant	prime broker						
Holding_connected_dominantPB $\times$ highIA	-3.19**	-1.78	-1.20	-0.70	1.04***	0.73**	2.03***			
	(-2.37)	(-1.22)	(-1.01)	(-0.71)	(3.98)	(2.47)	(4.54)			
Holding_connected_dominantPB	1.24	1.01	-0.22	-0.08	0.15	0.11	-0.69			
0	(0.63)	(0.97)	(-0.15)	(-0.04)	(0.47)	(0.34)	(-1.65)			
Holding_connected	-0.64	-0.71*	-0.01	-0.30	-0.02	0.11	0.37			
	(-0.62)	(-2.24)	(-0.01)	(-0.21)	(-0.11)	(0.54)	(1.74)			
highIA	0.10***	0.05	0.11***	0.09***	0.01*	0.01	0.00			
0	(6 74)	(1.76)	(12.85)	(7.20)	(2.02)	(1.52)	(0.75)			
Holding total dominantPB × highIA	-0.53*	0.14	-0.36	-0.28	-0.08	-0.00	-0.04			
	(-1.86)	(0.33)	(-1.76)	(-1.22)	(-1.08)	(-0.04)	(-0.31)			
Holding total dominantPB	0.07	0.10	0.22	0.12	0.07	0.01	0.10			
Holding_total_dominanti D	(0.15)	(0.15)	(1.22)	(0.02)	(1.77)	(0.15)	(1.00)			
Holding total	0.24**	0.00/	(1.25)	0.35**	0.02	0.02	(1.00)			
Holding_total	-0.24	-0.23	-0.24	-0.20	(0.72)	(0.62)	-0.00			
C	(-2.38)	(-2.75)	(-2.50)	(-2.81)	(0.72)	(0.63)	(-0.04)			
Constant	-0.08	-0.09	-0.02	-0.08	-0.05	-0.00	-0.00			
	(-0.30)	(-1.28)	(-0.29)	(-0.65)	(-1.70)	(-1.17)	(-1.08)			
Adjusted R-sq	0.15	0.13	0.22	0.21	0.09	0.11	0.07			
Number of deals	897	896	896	896	893	893	893			
Industry, Year, Advisor FE, Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes			

#### Table 11: Premium and abnormal returns: hedge fund performance and flows

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium (*Premium*) and abnormal returns of target (*TCAR*) and bidder (*ACAR*), controlling for hedge funds' performance and flows. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. *highIA* equals to one for high information asymmetry targets, and zero otherwise. *Holding\_connected\_low\_ret* is the holdings of hedge funds with returns below 30th percentile over the previous quarter. *Holding\_connected\_low\_flow* is the holdings of hedge funds with flows below the 30th percentile during the previous quarter. We use all the other controls as in Table 7, which are not reported for the sake of space. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Promium	TCAR	TCAR[-1,1]	(4) TCAR[-5.5]	ACAR	ACAR[-1, 1]	ACAR[-5.5]
	1 Telinum	10/110	10/110[-1,1]	10/11[-0,0]	nomi	10/11[-1,1]	10/11t[-0,0]
Panel A: Hedge funds have low returns							
Holding_connected_low_ret $\times$ highIA	4.61*	-2.39*	-0.36	-0.57	-0.82***	-0.47*	-0.87**
	(2.07)	(-2.20)	(-0.30)	(-0.25)	(-5.56)	(-1.91)	(-2.32)
Holding_connected_low_ret	0.66	0.34	-0.62	-0.15	-0.12	-0.13	0.04
	(1.29)	(0.58)	(-1.81)	(-0.32)	(-1.48)	(-1.17)	(0.23)
Holding_connected	-0.87	-0.58	0.00	-0.34	0.20	0.26	0.34
	(-0.83)	(-1.72)	(0.00)	(-0.35)	(1.34)	(1.15)	(1.46)
highIA	$0.08^{***}$	0.06	$0.10^{***}$	$0.08^{***}$	$0.01^{*}$	0.01	$0.01^{**}$
	(5.81)	(1.73)	(14.02)	(6.40)	(2.06)	(1.47)	(2.87)
Holding_total_low_ret $\times$ highIA	-0.17	-0.00	0.06	0.11	-0.04	-0.13	-0.30***
	(-0.34)	(-0.00)	(0.10)	(0.19)	(-0.52)	(-1.06)	(-3.77)
Holding_total_low_ret	0.03	0.13	0.25	0.27	-0.04	0.01	0.07
	(0.06)	(0.30)	(0.59)	(0.67)	(-1.24)	(0.18)	(1.01)
Holding_total	-0.28*	-0.20	-0.26**	-0.29**	0.03	0.03	0.02
-	(-2.13)	(-1.50)	(-2.34)	(-3.21)	(1.51)	(1.05)	(0.56)
Constant	-0.07	-0.09	-0.02	-0.08	-0.04	-0.04	-0.06
	(-0.31)	(-1.37)	(-0.34)	(-0.70)	(-1.54)	(-1.11)	(-1.12)
Adjusted R-sq	0.14	0.13	0.22	0.21	0.08	0.11	0.07
	Panel	B: Hedge	funds have lo	w flows			
Holding_connected_low_flow $\times$ high IA	-3.53*	-0.17	-1.75	-1.65	$1.34^{**}$	$0.88^{*}$	$1.36^{*}$
	(-2.17)	(-0.24)	(-1.46)	(-1.31)	(2.31)	(1.95)	(2.00)
Holding_connected_low_flow	$1.78^{*}$	0.17	0.76	0.88	-0.25	-0.16	0.02
	(2.13)	(0.65)	(1.14)	(1.26)	(-1.55)	(-1.17)	(0.14)
Holding_connected	-0.69	-0.61	-0.22	-0.48	0.06	0.16	0.17
	(-0.70)	(-1.44)	(-0.19)	(-0.40)	(0.53)	(0.74)	(0.85)
highIA	$0.09^{***}$	$0.07^{**}$	$0.11^{***}$	$0.09^{***}$	$0.01^{*}$	0.01	0.01
	(4.89)	(2.66)	(11.47)	(8.05)	(2.30)	(1.33)	(1.16)
Holding_total_low_flow $\times$ highIA	-0.31	-0.92***	-0.45	-0.61	-0.07	-0.17	-0.16
	(-0.36)	(-4.36)	(-0.94)	(-1.42)	(-1.09)	(-1.39)	(-1.53)
Holding_total_low_flow	0.11	$0.58^{**}$	0.28	0.38	0.07	0.14	0.09
	(0.16)	(2.57)	(0.76)	(1.07)	(0.86)	(1.48)	(0.77)
Holding_total	-0.30*	-0.20	-0.24**	-0.26**	0.02	0.02	0.01
-	(-2.26)	(-1.54)	(-2.40)	(-3.12)	(1.13)	(0.56)	(0.39)
Constant	-0.06	-0.09	-0.02	-0.07	-0.04	-0.04	-0.05
	(-0.26)	(-1.43)	(-0.24)	(-0.62)	(-1.42)	(-1.07)	(-0.98)
Adjusted R-sq	0.15	0.13	0.22	0.22	0.09	0.11	0.07
Number of deals	897	896	896	896	893	893	893
Industry, Year, Advisor FE, Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 12: Premium and abnormal returns: importance of information sharing for the bidder

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium (*Premium*) and abnormal returns of target (*TCAR*) and bidder (*ACAR*), accounting for the importance of information sharing for the bidder. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement.  $Diff_Ind$  is a dummy variable that equals one if the bidder and target are from different 3-digit SIC code industries, and 0 otherwise. *Number of bidders* is the number of bidder involved. *Pctstock* is the percentage of stock payment. *Merger\_wave* is a dummy variable that equals one when there is a merger wave in the target-acquirer industry. *Abnormal\_fees* is the abnormal fees paid by the acquirer. *highIA* equals one for high information asymmetry targets, and zero otherwise. We use all the other controls as in Table 7, which are not reported for the sake of space. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1) Premium	(2) TCAB	(3) TCAB[-1,1]	(4) TCAB[-5.5]	(5) ACAB	(6) ACAR[-1,1]	(7) ACAB[-5.5]	:
Panel A.	Target and 1	bidder are	from different	industry			1101111[ 0,0]	-
Holding connected × Diff Ind × highIA	-6.92***	-1.99**	-1.89**	-3.03***	0.96	0.95	1.15	-
	(-7.97)	(-2.53)	(-2.94)	(-3.79)	(1.29)	(1.35)	(1.34)	
Holding_connected × Diff_Ind	5.14**	1.36	0.59	1.31	-0.39	-0.47	-0.27	
	(3.11)	(1.73)	(0.57)	(1.26)	(-0.85)	(-1.03)	(-0.58)	
Holding_connected	-1.17	-0.68	-0.06	-0.31	0.11	0.22	0.25	
0	(-0.84)	(-1.48)	(-0.06)	(-0.30)	(0.64)	(1.02)	(1.12)	
highIA	0.11***	0.06	0.11***	0.10***	0.01	0.00	0.01	
	(10.34)	(1.82)	(11.37)	(7.81)	(1.68)	(0.66)	(1.15)	
Holding total × Diff Ind × highIA	-0.37	-0.06	-0.19	-0.20	-0.05	-0.02	-0.13**	
fiording_total / Dinging / ingini	(-1.78)	(-0.18)	(-0.85)	(-0.88)	(-1.43)	(-0.27)	(-2.48)	
Holding total × Diff Ind	-0.47*	-0.13	-0.07	-0.03	0.03	0.08*	0.09	
fiolding-total × Din-Ind	(-2.20)	(-0.41)	(-0.22)	(-0.10)	(0.84)	(2.11)	(1.33)	
Holding total	0.12	0.14	0.19	0.22	0.02	0.01	0.01	
fiolding_total	-0.12	-0.14	-0.19	-0.22	(0.76)	(0.18)	(0.21)	
Constant	(-0.31)	(-0.80)	(-1.13)	(-1.46)	0.04	0.04	0.06	
Constant	-0.10	-0.10	-0.03	-0.09	-0.04	-0.04	-0.00	
All of a D and	(-0.41)	(-1.00)	(-0.45)	(-0.73)	(-1.48)	(-0.90)	(-1.00)	-
Adjusted R-sq	0.16	0.13	0.22	0.22	0.09	0.11	0.07	-
Par	nel B: More	than one b	idder is involv	red				_
Holding_connected $\times$ Number of bidders $\times$ highIA	-3.01***	-1.71***	-1.73***	$-2.16^{***}$	0.24	0.34	0.41	-
	(-6.38)	(-4.54)	(-4.32)	(-5.11)	(0.76)	(0.88)	(0.89)	
Holding_connected $\times$ Number of bidders	0.27	$1.34^{**}$	0.44	0.57	-0.23	-0.25	0.12	
	(0.23)	(3.10)	(0.43)	(0.59)	(-1.14)	(-0.93)	(0.51)	
Holding_connected	-0.27	-1.61**	-0.35	-0.60	0.37	0.43	0.10	
0	(-0.14)	(-2.40)	(-0.17)	(-0.31)	(1.15)	(1.03)	(0.27)	
highIA	0.16***	0.06	0.12***	0.12***	0.01	0.01	0.01	
0	(5.22)	(1.76)	(4.06)	(3.93)	(1.38)	(0.68)	(0.99)	
Holding_total $\times$ Number of bidders $\times$ highIA	-0.42*	0.04	-0.11	-0.15	-0.02	-0.03	-0.05	
	(-2.30)	(0.20)	(-0.60)	(-0.79)	(-0.47)	(-0.46)	(-0.94)	
Holding total × Number of bidders	-0.75*	-0.62**	-0.06	-0.19	-0.09**	-0.06	-0.14**	
fiording_total of framoer of bradero	(-1.95)	(-2.75)	(-0.20)	(-0.59)	(-2.48)	(-1.06)	(-3.06)	
Holding total	0.70	0.47	-0.11	0.02	0.12**	0.10	0.19***	
fiolding_total	(1.52)	(1.60)	(0.30)	(0.04)	(2.50)	(1.27)	(4.15)	
Constant	0.24	0.17***	(-0.50)	0.12	0.06*	0.06	(4.15)	
Constant	-0.24	-0.17	-0.04	-0.12	-0.00	-0.00	-0.08	
Adjusted D an	(-1.17)	(-3.43)	(-0.01)	(-1.32)	(-1.93)	(-1.55)	(-1.36)	-
Adjusted R-sq	0.15	0.14	0.22	0.22	0.08	0.11	0.07	-
	Panel	C: Stock p	ayment					
Holding_connected $\times$ Pctstock $\times$ highIA	-0.29	0.12	-0.59	-0.62	1.66	1.06	2.41	•
	(-0.13)	(0.10)	(-0.35)	(-0.27)	(1.79)	(1.15)	(1.60)	
Holding_connected $\times$ Pctstock	-3.81	-0.06	-1.14	-2.43	-0.39	-0.55*	-1.47***	
	(-1.55)	(-0.06)	(-0.58)	(-1.39)	(-1.69)	(-1.92)	(-4.82)	
Holding_connected	0.62	-0.55*	0.23	0.40	0.09	0.27*	0.54***	
0	(0.54)	(-2.19)	(0.19)	(0.33)	(0.99)	(2.28)	(3.90)	
highIA	0.09***	0.05	0.10***	0.08***	0.01	0.00	0.00	
	(5.32)	(1.54)	(8.31)	(5.74)	(1.82)	(0.60)	(0.18)	
Holding total × Petstock × highIA	0.01	0.11	0.09	0.05	0.08	0.04	0.05	
fiolding-total × r ctstock × inginit	(0.02)	(0.34)	(0.33)	(0.19)	(0.87)	(0.40)	(0.95)	
Holding total × Petstock	-0.18	-0.61*	-0 42**	-0.37*	-0.10**	-0.12**	-0.03	
Totaling_south A Totalook	(-0.21)	(_2 10)	(_9.48)	(_2 18)	(_2 42)	(_2 44)	(-0.43)	
Holding total	(-0.31)	(-2.10)	(-2.40)	(-2.10)	(-2.42) 0.04**	(-2.44 <i>)</i> 0.05*	(-0.43)	
nording_rorat	-0.24	-0.01	-0.11	-0.14	(9.76)	(0.00)	(0.20)	
Constant	(-1.59)	(-0.09)	(-1.33)	(-1.52)	(2.70)	(2.03)	(0.29)	
Constant	-0.04	-0.06	0.01	-0.04	-0.03	-0.03	-0.04	
	(-0.15)	(-0.67)	(0.15)	(-0.36)	(-1.14)	(-0.83)	(-0.81)	- 6
Adjusted R-sq	0.15	0.14	0.23	0.22	0.10	0.12	0.08	0.
Number of deals	897	896	896	896	893	893	893	
Industry, Year, Advisor FE, Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Table 12: Premium and abnormal returns: the importance of information sharing for the<br/>bidder (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Premium	TCAR	TCAR[-1,1]	TCAR[-5,5]	ACAR	ACAR[-1,1]	ACAR[-5,5]
	Panel D	: During	merger waves				
Holding_connected $\times$ Merger_wave $\times$ highIA	$-6.17^{***}$	-3.38*	-4.91**	-6.05**	0.10	-0.37	-0.79
	(-4.53)	(-2.11)	(-2.31)	(-3.19)	(0.27)	(-0.82)	(-1.50)
Holding_connected $\times$ Merger_wave	1.51	0.71	1.63	1.73	-0.20	-0.25	0.00
	(0.80)	(0.90)	(0.70)	(0.74)	(-1.35)	(-1.31)	(0.01)
Holding_connected	-0.80	-0.56	-0.49	-0.65	0.22	0.35	0.38
	(-0.72)	(-1.40)	(-0.67)	(-0.97)	(1.27)	(1.35)	(1.08)
highIA	$0.09^{**}$	0.04	$0.09^{**}$	$0.08^{**}$	$0.01^{*}$	0.01	$0.01^{**}$
	(2.63)	(1.40)	(3.14)	(2.67)	(2.01)	(1.39)	(2.84)
Holding_total $\times$ Merger_wave $\times$ highIA	0.12	0.54	0.46	0.50	-0.01	0.01	-0.10*
	(0.18)	(0.80)	(0.61)	(0.64)	(-0.21)	(0.30)	(-2.21)
Holding_total $\times$ Merger_wave	0.16	0.09	0.02	-0.03	-0.02	-0.02	$-0.04^{*}$
	(1.10)	(0.56)	(0.12)	(-0.13)	(-0.60)	(-0.54)	(-2.26)
Holding_total	-0.36**	-0.28*	-0.28**	$-0.29^{**}$	0.03	0.03	0.04
	(-2.40)	(-2.17)	(-2.78)	(-2.83)	(1.07)	(0.64)	(1.12)
Constant	-0.06	-0.07	-0.01	-0.06	-0.04	-0.05	-0.06
	(-0.24)	(-1.15)	(-0.09)	(-0.46)	(-1.78)	(-1.19)	(-1.20)
Adjusted R-sq	0.15	0.14	0.23	0.22	0.08	0.11	0.07
	Panel E: E	Bidder pay	's abnormal fe	es			
Holding_connected $\times$ Abnormal_fees $\times$ high IA	0.32	$-1.69^{*}$	-0.18	0.30	0.21	$0.36^{**}$	0.57
	(0.19)	(-2.03)	(-0.12)	(0.23)	(0.91)	(2.47)	(1.65)
Holding_connected ×Abnormal_fees	-0.04	$1.33^{***}$	-0.37	-0.34	-0.18	-0.15	-0.09
	(-0.03)	(3.49)	(-0.19)	(-0.18)	(-1.03)	(-0.87)	(-0.59)
Holding_connected	-0.44	-0.46	-0.08	-0.30	0.14	0.21	0.33
	(-0.41)	(-1.21)	(-0.09)	(-0.30)	(0.93)	(0.95)	(1.59)
Abnormal_fees	$0.02^{*}$	0.01	0.01	$0.01^{*}$	-0.00**	-0.00**	-0.00
	(2.16)	(1.82)	(1.85)	(1.96)	(-2.87)	(-3.17)	(-0.43)
highIA	$0.08^{***}$	$0.05^{*}$	$0.10^{***}$	$0.08^{***}$	$0.01^{*}$	0.01	0.00
	(5.53)	(1.87)	(14.37)	(8.76)	(2.22)	(1.14)	(1.07)
$Holding\_total \times Abnormal\_fees \times highIA$	-0.05	$-0.11^{*}$	-0.01	-0.03	-0.01	-0.01	-0.01*
	(-1.28)	(-2.04)	(-0.23)	(-0.50)	(-1.11)	(-1.37)	(-2.23)
Holding_total $\times$ Abnormal_fees	$-0.15^*$	-0.01	-0.09**	-0.08**	$0.01^{**}$	$0.02^{***}$	0.00
	(-2.16)	(-0.20)	(-2.67)	(-2.51)	(2.39)	(3.64)	(0.28)
Holding_total	$-0.32^{*}$	-0.19	$-0.24^{*}$	-0.27**	0.02	0.03	0.01
	(-1.98)	(-1.72)	(-2.02)	(-2.39)	(1.13)	(0.70)	(0.35)
Constant	-0.04	-0.10	-0.00	-0.05	-0.04	-0.05	-0.06
	(-0.17)	(-1.21)	(-0.01)	(-0.49)	(-1.49)	(-1.09)	(-0.98)
Adjusted R-sq	0.15	0.14	0.22	0.22	0.08	0.11	0.06
Number of deals	897	896	896	896	893	893	893
Industry, Year, Advisor FE, Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

# Table 13: Classification of insider trading

This table reports the classification of insider trading and the number of insider trading instances in each class. The fraction of the total deals is the number of insider trading in each class divided by the total number of deals in our sample, and the fraction of the total insider trading cases is the number of insider trading cases in each class divided by the total number of insider trading instances with targets.

	Senior management, Target	Personal connection of Senior management, Target	Other employee, Target
Number of insider trading with target	8	4	4
Fraction of the total deals	0.86%	0.43%	0.43%
Fraction of the total insider trading cases	12.31%	6.15%	6.15%
	Senior management, Bidder	Personal connection of senior management, Bidder	Other employee, Bidder
Number of insider trading with target	6	2	6
Fraction of the total deals	0.64%	0.21%	0.64%
Fraction of the total insider trading cases	9.23%	3.08%	9.23%
	Affiliated company employees (non investment banks)	Affiliated investment bank employee	Personal connection of investment bank employee
Number of insider trading with target	17	14	1
Fraction of the total deals	1.83%	1.50%	0.11%
Fraction of the total insider trading cases	26.15%	21.54%	1.54%
	Hedge Funds	Unknown	Other
Number of insider trading with target	1	1	1
Fraction of the total deals	0.11%	0.11%	0.11%
Fraction of the total insider trading cases	1.54%	1.54%	1.54%

#### Table 14: Short-selling in the acquirers

This table reports the results from Equation (5) for the impact of connected fund holdings on abnormal short-selling in the acquirers.  $ASIR_{t-1}$ ,  $ASIR_t$ , and  $ASIR_{t+1}$  are the abnormal short interest ratio for acquirers in the previous, current, and next month of the deal announcement. *Connected* is a dummy variable that equals one if the target in a deal is held by hedge funds whose prime broker is also the advisory bank in a deal, and zero otherwise. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
2	ASII	K_t-1	AS	lK_t	ASIF	κ_t+1
Connected	-0.00		-0.09		-0.14	
TT 11	(-0.03)	0 51	(-0.45)	0.05×	(-0.33)	0 50
Holding_connected		-0.71		-6.05*		-9.56
II. 1.1. and a dark of	0.15	(-0.23)	0.10	(-2.00)	0.00	(-1.46)
Holding_total	-0.15	-0.12	(0.19)	0.44	0.89	1.28
II.1.1.	(-0.38)	(-0.41)	(0.36)	(0.88)	(0.91)	(1.24)
Holding_acquirer	$1.01^{-1}$	1.01"	(1.06)	(0.02)	-0.19	-0.21
Techold	(1.94)	(1.98)	(1.06)	(0.93)	(-0.19)	(-0.19)
Toenold	-0.01	-0.00	-0.01	-0.01	-0.01	-0.01
DOA +	(-0.00)	(-0.52)	(-0.77)	(-0.37)	(-0.79)	(-0.55)
ROA_t	(0.02)	(0.01)	(0.02)	(1.15)	0.00	(0.49)
T arrange ma d	(0.04)	(0.05)	(0.92)	(1.15)	(0.91)	(0.74)
Leverage_t	(1.72)	(1.02)	(2.02)	(2.24)	(2.54)	(2.61)
B/M +	(1.73)	(1.95)	(2.02)	(2.23)	(2.94)	(2.01)
D/ 1VI_0	-0.11	-0.11	-0.10	-0.12	(0.03)	0.00
Size	0.00	0.00	-0.02	(-1.04) _0.02	-0.01	-0.02
DIZC_A	(0.14)	(0.11)	-0.02	-0.02	-0.01	-0.02
B/M a	0.00	0.00	0.01	0.01	0.01	0.00
D/ m_d	(0.00)	(0.78)	(1.74)	(1.72)	(0.01)	(1.07)
Tangible t	-0.41	-0.41	-0.46	-0.46	-0.76	-0.77
10112101C-0	(_1 44)	(-1.45)	-0.40 (_1.00)	(_1 13)	(_1 37)	(_1.43)
BELSIZE	-0.03	-0.03	0.02	0.01	0.00	0.00
	-0.05 (_0.06)	(_0.03	(0.52)	(0.44)	(1.93)	(1.15)
Valpet	-0.02	-0.02	0.06**	0.06	0.14	0.14
(aper	(-1.08)	(-0.98)	(2.45)	(1.53)	(1.15)	(1.32)
MFhold	-0.10	-0.10	-0.19	-0.21	-0.21	-0.24
ini noru	(-0.37)	(-0.37)	(-0.47)	(-0.48)	(-0.37)	(-0.38)
Pctcash	0.29***	0.30***	0.16	0.18	-0.22	-0.19
	(4.61)	(4.05)	(1.63)	(1.49)	(-0.99)	(-0.74)
Hostile	1.13	1.13	1.07	1.06	0.01	-0.00
	(1.04)	(1.04)	(0.94)	(0.93)	(0.01)	(-0.00)
Diff_Ind	0.13	0.13	0.16	0.16	0.22	0.23
	(1.06)	(1.05)	(0.71)	(0.74)	(0.71)	(0.76)
Merger of equals	-0.12	-0.12	-0.21	-0.20	-0.73*	-0.72*
- ·	(-1.00)	(-0.97)	(-1.30)	(-1.27)	(-1.96)	(-1.95)
Tender	-0.13	-0.13	-0.19	-0.20	-0.36**	-0.38**
	(-1.28)	(-1.27)	(-1.72)	(-1.84)	(-2.45)	(-2.73)
Number of bidders	0.13	0.13	0.25	0.26	0.75	0.76
	(1.00)	(1.00)	(1.06)	(1.12)	(0.93)	(0.95)
IMR_holding	$0.01^{**}$	$0.01^{**}$	0.01	0.01	-0.00	-0.00
	(3.06)	(3.02)	(1.44)	(1.30)	(-0.18)	(-0.05)
IMR_bigbank	0.00	0.00	0.00	0.00	0.00	0.00
	(1.27)	(1.66)	(0.86)	(1.60)	(0.57)	(0.98)
Activism	0.61	0.61	0.14	0.17	-0.07	-0.02
	(1.42)	(1.46)	(0.41)	(0.52)	(-0.17)	(-0.04)
Constant	$0.73^{**}$	$0.72^{**}$	$0.86^{*}$	0.80	0.88	0.79
	(2.82)	(3.02)	(2.07)	(1.84)	(0.56)	(0.49)
Adjusted R-sq	-0.01	-0.01	-0.07	-0.07	0.67	0.67
Number of deals	870	870	870	870	870	870
Industry, Year, Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

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#### Table 15: Post-merger performance

This table reports the results from Equation (5) for the impact of connected fund holdings on post-merger performance. ROA, ROE, and NPM are the return on assets, return on equity, and net profit margin of the merged firm one year after the acquisition. Connected is a dummy variable that equals one if the target in a deal is held by hedge funds whose prime broker is also the advisory bank in a deal, and zero otherwise. Holding\_connected (Holding\_total) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(2)	(4)	(5)	(6)
	(1) D(	(4)	(0) D/	)F	(J) NI	PM (0)
Corrected	0.00	JA	0.02	<u>JE</u>	0.01	111
Connected	-0.00		-0.03		-0.01	
Holding connected	(-0.65)	0.00	(-1.70)	0.09	(-0.19)	0.96
notang_connected		-0.00		(0.10)		(0.20)
Helding total	0.02*	(-0.00)	0.05*	(0.10)	0.94***	(0.39) 0.99***
monding_total	$(0.02^{\circ})$	(1.97)	-0.05 <sup>**</sup>	$(0.00^{-0.0})$	(5.42)	(5.78)
Holding acquirer	(2.12)	(1.07)	(-2.07)	(-2.70)	(0.45)	(0.70)
fiolding_acquirer	(0.02)	(0.02)	-0.00	(1.20)	-0.04	-0.04
Techold	(0.00)	(0.00)	0.00	(-1.39)	(-0.10)	(-0.10)
Toenoid	(0.00)	(0.00)	(0.00)	-0.00	(1.16)	(1.18)
POA +	0.00***	0.00***	(-0.97)	(-0.94)	(1.10)	(1.10)
ROA_U	(2.64)	(2,52)	(1.02)	(0.05)	(1.59)	(1.50)
T arrange ma t	(3.04)	(3.52)	(1.02)	(0.95)	(1.52)	(1.50)
Leverage_t	-0.00	-0.00	-0.01	-0.01	(0.01)	(0.20)
D/M+	(-0.00)	(-0.01)	(-0.42)	(-0.48)	(0.40)	(0.59)
D/ M_t	(2, 10)	(9.17)	-0.00	-0.01	(1.07)	(1.00)
Sizo o	(2.10)	(2.17)	(-0.74) 0.09***	(-0.93) 0.01***	(1.97)	(1.90)
Size_a	(9.75)	(2.00)	(4.9.4)	(C 14)	(2.00)	(2.04)
D/M	(3.75)	(3.92)	(4.84)	(0.14)	(3.29)	(3.04)
B/M_a	-0.00	-0.00	(10.00)	(12.07)	-0.00	-0.00
The south has t	(-1.24)	(-1.25)	(12.68)	(13.95)	(-1.11)	(-1.07)
langible_t	-0.00	-0.00	(1.10)	(1.00)	-0.11	-0.11
DDLCIZE	(-0.62)	(-0.58)	(1.12)	(1.09)	(-1.39)	(-1.36)
RELSIZE	-0.00	-0.00	$0.01^{***}$	0.01***	-0.01	-0.01
37.1	(-0.68)	(-0.70)	(4.72)	(4.01)	(-0.42)	(-0.42)
Valpet	-0.00	-0.00	0.01	(0.00)	-0.01	-0.01
	(-1.67)	(-1.81)	(0.42)	(0.27)	(-0.51)	(-0.50)
MFhold	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-1.62)	(-1.76)	(-0.72)	(-0.91)	(-0.20)	(-0.22)
Petcash	0.01*	0.01*	0.02	0.02	0.06**	0.06**
	(2.29)	(2.30)	(1.50)	(1.51)	(2.56)	(2.48)
Hostile	-0.02	-0.02	0.01	0.00	-0.14	-0.14
	(-1.31)	(-1.43)	(0.33)	(0.11)	(-1.14)	(-1.22)
Diff_Ind	0.00	0.00	0.01	0.01	0.02	0.02
	(0.91)	(0.94)	(1.37)	(1.41)	(1.01)	(1.00)
Merger of equals	-0.01	-0.01	-0.07	-0.07	-0.07	-0.07
	(-0.50)	(-0.51)	(-1.78)	(-1.83)	(-0.23)	(-0.23)
Tender	0.00	0.00	-0.01	-0.01	-0.02	-0.01
	(1.06)	(1.12)	(-0.82)	(-0.64)	(-0.91)	(-0.92)
Number of bidders	-0.00	-0.00	-0.02*	-0.02*	-0.10	-0.10
	(-0.50)	(-0.51)	(-2.07)	(-2.02)	(-1.09)	(-1.08)
IMR_holding	0.00	0.00	0.00	0.00	0.00	0.00
	(1.76)	(1.81)	(1.06)	(1.20)	(1.44)	(1.34)
IMR_bigbank	0.00	-0.00	$0.00^{***}$	$0.00^{**}$	0.00	0.00
	(0.67)	(-0.05)	(4.24)	(3.32)	(1.05)	(0.55)
Activism	0.00	0.00	-0.03	-0.03	$0.17^{***}$	$0.16^{***}$
	(0.16)	(0.20)	(-0.60)	(-0.61)	(5.08)	(4.41)
Constant	-0.06***	-0.06***	-0.16***	-0.16***	-0.64***	-0.64***
	(-7.13)	(-6.77)	(-4.56)	(-4.71)	(-5.86)	(-5.81)
Adjusted R-sq	0.28	0.28	0.03	0.03	0.11	0.11
Number of deals	772	772	772	772	771	771
Industry, Year, Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

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# Table 16: Propensity score matching results

Panel A reports the balancing test results from the propensity score matching procedure. The treated group includes deals with connected fund holdings, and the control group includes other deals. Panel B reports the propensity score matching results for deals announced between January 2000 and September 2019. All variables are defined in Table 2. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Mat				
	Treated (with	Control (without	%bias	t-stat	
	connected holdings)	connected holdings)			
B/M_t	0.463	0.410	10.700	0.370	
Size_a	8.990	9.184	-11.300	-0.390	
B/M_a	0.350	0.355	-2.900	-0.100	
RELSIZE	0.285	0.204	21.100	0.730	
Valpct	0.322	0.229	24.800	0.860	
MFhold_t	0.100	0.119	-12.700	-0.440	
Pctcash	0.613	0.730	-28.200	-0.980	
Diff_Ind	0.333	0.292	8.800	0.310	
$Holding\_total$	0.150	0.130	26.000	0.900	
Panel B: Matching results					
	Treated (with	Control (without	Difference	t-stat	
	connected holdings)	connected holdings)			
Complete	1.000	1.000	0.000		
Premium (one week)	0.278	0.446	-0.167	-1.990**	
Premium (four weeks)	0.340	0.532	-0.192	$-1.960^{**}$	
TCAR	0.173	0.313	-0.140	$-1.960^{**}$	
TCAR[-1,1]	0.202	0.371	-0.169	-2.380**	
TCAR[-3,3]	0.221	0.372	-0.151	-2.090**	
TCAR[-5,5]	0.215	0.381	-0.166	-2.270**	
ACAR	-0.007	-0.003	-0.004	-0.280	
ACAR[-1,1]	0.005	-0.002	0.007	0.430	
ACAR[-3,3]	0.004	0.000	0.003	0.210	
ACAR[-5,5]	0.005	0.000	0.005	0.270	

# Advisor-hedge fund connections, information flows, and deal outcomes in mergers and acquisitions Supplementary results

# Appendix A Deals involving connected advisors

To ensure that our results are not driven by some systematic, possibly unobserved differences between connected and unconnected advisors, we repeat the analysis using the sub-sample of deals involving advisors that are connected in at least one deal in our sample. Hence, we drop all deals involving advisors that are never connected. The remaining advisors are connected in some of the deals in this sub-sample, while they are unconnected in others. In total, we identify 538 deals with these "at-least-once-connected" advisors, accounting for 58% of the sample. The results in tables A1 to A4 indicate that our main conclusions remain qualitatively unchanged when using this connected sub-sample of deals. The 'indirect toehold' information channel appears to be robust. It requires a direct link between hedge funds and their prime broker to be manifest in the M&A outcomes.

This table reports the results from Equation (1), examining the acquirer's choice of advisors in M&As using deals that involve connected advisors. The dependent variable is a dummy variable that equals one if an advisor is hired by the acquirer for the deal, and zero otherwise. *Connected* is a dummy variable that equals one if an advisor is the prime broker of a hedge fund with holdings in the target firm, and zero otherwise. *Holding\_connected* is the percentage holdings of an advisor's connected hedge funds in the target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected_advisor	0.55***	
	(21.00)	
Holding_connected		$2.02^{***}$
		(2.60)
Acquisition times	$0.06^{***}$	0.08***
	(14.76)	(20.39)
Acquisition value	-0.00	-0.00
	(-0.99)	(-0.80)
Prior advisor	1.12***	1.19***
	(4.96)	(5.43)
Expertise	0.10***	0.11***
-	(5.21)	(9.42)
IMR_holding	-0.00	-0.00
-	(-0.91)	(-0.92)
Activism	0.05	0.04
	(0.31)	(0.22)
Constant	-3.14***	-3.43***
	(-38.94)	(-29.77)
Pseudo R-sq	0.19	0.17
Number of deals	520	520
Observations	25868	25868
Industry, Year FE	Yes	Yes

Table A2: Ch	noice of the	e target:	deals	involving	connected	advisors
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This table reports the results from Equation (3), examining the acquirer's choice of targets in M&As using deals that involve connected advisors. The dependent variable is a dummy variable that equals one if a firm is chosen to be the target, and zero otherwise. *Connected* is a dummy variable that equals one if a firm is held by hedge funds whose prime broker is the advisor and zero otherwise. *Holding\_connected* is the percentage holdings of an advisor's connected hedge funds in the firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(0)
	(1)	(2)
Connected	$1.06^{***}$	
	(8.04)	
Holding_connected		$13.23^{***}$
		(7.98)
Size	-0.03	$0.05^{***}$
	(-1.32)	(2.87)
B/M	-0.00**	-0.00**
	(-1.98)	(-2.46)
ROE	$0.01^{***}$	$0.01^{***}$
	(4.18)	(4.03)
Leverage	-0.07	-0.06
<u> </u>	(-1.42)	(-0.99)
Tangible	-0.28***	-0.23**
	(-3.38)	(-2.13)
Liquidity	0.00	0.00
1 0	(0.16)	(0.17)
Sales	-0.09***	-0.10***
	(-5.63)	(-3.74)
P/E	-0.00	-0.00
,	(-1.08)	(-0.67)
IMR_holding	0.00***	-0.00
C	(2.74)	(-0.19)
IMR_bigbank	$0.00^{*}$	0.00
C	(1.77)	(1.50)
Activism	0.12	$0.03^{-1}$
	(1.29)	(0.76)
Constant	-0.47	-0.69***
	(-1.36)	(-4.38)
Pseudo R-sq	0.10	0.04
Number of deals	441	441
Observations	2415	2415
Industry, Year, Advisor FE	Yes	Yes

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#### Table A3: Changes in hedge fund holdings: deals involving connected advisors

This table reports the results from Equation (4) for the changes in the hedge fund holdings in a target or acquirer and the changes in shares of the target or acquirer in the hedge fund portfolio using deals that involve connected advisors. Panel A reports the results for the changes in target holdings/shares one quarter before (t - 1) and one quarter after (t + 1) the deal announcement. Panel B reports similar results for holdings/shares in bidders. Panel C reports the changes in implied holdings/shares in bidder from one quarter before the deal announcement to deal completion (denoted by q), and during the first quarter after the completion (denoted by q + 1). Connected is a dummy variable that equals one if a hedge fund's prime broker is also the advisory bank in a deal, and zero otherwise. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Changes in holdings/shares in target around announcement						
	(1)	(2)	(3)	(4)		
	$\Delta Holding_{t-1}$	$\Delta Holding_{t+1}$	$\Delta Shares_{t-1}$	$\Delta Shares_{t+1}$		
Connected	0.01	0.02	0.05	-0.01		
	(0.81)	(1.11)	(1.47)	(-0.19)		
Constant	-0.00	-0.21	-0.07	0.04		
	(-0.03)	(-0.58)	(-1.05)	(0.28)		
Adjusted R-sq	0.04	0.19	0.33	0.35		
Number of deals	538	364	538	364		
Observations	24824	18780	24824	18780		
Deal and Fund FE	Yes	Yes	Yes	Yes		

Panel B: Changes i	n holdings/s	shares in	bidder arou	nd announcement
i and b. Changes i	I IIOIGIIIGO/ k	OTION OD III	oración anou	ind announcement

	$\Delta Holding_{t-1}$	$\Delta Holding_{t+1}$	$\Delta Shares_{t-1}$	$\Delta Shares_{t+1}$
Connected	-0.01**	0.00	0.00	0.03
	(-2.11)	(0.62)	(0.11)	(0.69)
Constant	0.07	-0.14	0.02	-0.05
	(0.89)	(-1.03)	(0.56)	(-1.01)
Adjusted R-sq	0.04	0.05	0.21	0.25
Number of deals	516	347	516	347
Observations	35667	22128	35667	22128
Deal and Fund FE	Yes	Yes	Yes	Yes

Panel C: Changes in holdings/shares in bidder after completion

	<u>AHoldina</u>	$\Delta Holding_{-+1}$	AShares_	$\Delta Shares_{-+1}$
<u> </u>	<u></u>	<u> </u>	<u> </u>	
Connected	$-0.018^{***}$	0.000	-0.043	-0.002
	(-3.153)	(0.135)	(-1.483)	(-0.101)
Constant	-0.051*	$0.012^{**}$	-0.072**	$0.025^{*}$
	(-1.864)	(2.152)	(-2.057)	(1.670)
Adjusted R-sq	0.05	0.03	0.11	0.08
Number of deals	471	471	471	471
Observations	59488	59488	56774	59488
Deal and Fund FE	Yes	Yes	Yes	Yes

#### Table A4: Premium and abnormal returns: deals involving connected advisors

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium and abnormal returns moderated by the information asymmetry of targets using deals that involve connected advisors. *Premium* is the premium paid one week before the announcement. TCAR and ACAR are the cumulative abnormal returns on target and acquirer over an event window of [0], [-1,1], and [-5,5], respectively. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. *highIA* equals to one for high information asymmetry targets, and zero otherwise. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Premium	TCAR	TCAR[-1,1]	TCAR[-5,5]	ACAR	ACAR[-1,1]	ACAR[-5,5]
Holding_connected $\times$ highIA	-1.62	-1.43	-2.32**	-2.60**	0.29	0.26	0.55
0	(-1.05)	(-1.29)	(-2.82)	(-2.64)	(0.52)	(0.29)	(0.53)
Holding_connected	-0.33	-0.62**	0.11	0.11	0.08	0.18	0.25
0	(-0.38)	(-2.32)	(0.18)	(0.17)	(0.62)	(1.65)	(1.45)
highIA	0.10**	0.05	0.11**	0.06*	0.01	0.00	-0.01
5	(2.34)	(1.10)	(2.87)	(1.98)	(0.94)	(0.04)	(-0.40)
Holding_total $\times$ highIA	-0.66*	-0.23	-0.37	-0.27	-0.05	0.04	-0.00
	(-2.04)	(-0.84)	(-1.31)	(-1.28)	(-0.77)	(0.46)	(-0.02)
Holding total	0.10	0.01	-0.03	-0.11	0.04	0.05	0.00
	(0.80)	(0, 09)	(-0.33)	(-1.45)	(1.10)	$(1 \ 11)$	(0.08)
Holding acquirer	-0.03	-0.02	0.03	0.08	-0.01	0.07	0.06
fiorang_acquirer	(-0.11)	(-0.12)	(0.11)	(0.25)	(-0.33)	(1.04)	(0.92)
Toehold	0.00	0.01***	0.00	0.00	-0.00	-0.00**	-0.00**
Toenoid	(0.56)	(4.12)	(0.47)	(0.64)	-0.00	(-2.58)	(-3.31)
BOA t	-1 00***	-0 24**	-0.29***	-0.27	0.14	0.06	0.11
10011_0	(-18.41)	(-2.36)	(-3.80)	(-1.36)	(0.01)	(0.38)	(1.08)
Lovorago t	0.06	0.00	0.02	0.01	0.01	0.00	0.02
Levelage_t	(1.55)	(0.00)	(0.46)	(0.26)	(0.80)	-0.00	(1.34)
B/M +	(1.55)	0.03)	(0.40)	(0.20)	0.09)	(-0.27)	(-1.34)
D/ 141_0	(1.08)	(0.38)	(0.40)	(0.55)	-0.01	-0.00	-0.00
Sizo	0.05***	0.02	0.05***	0.06***	(-0.00)	(-0.30)	(-0.04)
Size_a	(5.22)	(1.70)	(1.05)	(5 69)	(0.96)	-0.00	(0.42)
D/M a	(0.02)	(1.70)	(4.60)	(3.08)	(0.20)	(-0.00)	(0.42)
D/M_a	(0.25)	(0.68)	(1.04)	(0.25)	-0.00 · · ·	-0.00	-0.00
Ton wible 4	(0.55)	(0.08)	(1.04)	(0.55)	(-0.90)	(-2.62)	(-8.10)
langible_t	(0.07)	0.03	0.03	-0.00	-0.00	-0.02	-0.02
DELCIZE	(2.29)	(0.47)	(0.90)	(-0.05)	(-0.23)	(-0.00)	(-0.55)
RELSIZE	-0.01	-0.01	-0.00	-0.01	-0.00	-0.01	-0.01
V-lo of	(-0.32)	(-2.02)	(-0.01)	(-0.53)	(-1.51)	(-2.22)	(-4.08)
valpct	(0.50)	0.02	(0.04)	(2.02)	-0.00	-0.00	-0.00
	(2.58)	(0.98)	(2.29)	(3.02)	(-0.53)	(-0.04)	(-0.60)
MFhold	0.02	0.03	0.04	0.00	-0.03	-0.03	-0.02
	(0.17)	(0.22)	(0.65)	(0.07)	(-0.86)	(-0.90)	(-0.92)
Petcash	-0.12	0.00	-0.00	-0.02	0.01	0.02	0.02
TT	(-0.95)	(0.05)	(-0.07)	(-0.24)	(1.01)	(1.36)	(1.24)
Hostile	-0.02	0.03	-0.06	-0.05	0.02	0.02	0.01
D:#1 1	(-0.35)	(0.70)	(-1.18)	(-1.02)	(1.03)	(0.86)	(0.36)
Diff_Ind	0.02	0.02	-0.02	-0.01	-0.00	-0.01	-0.01
	(0.68)	(1.57)	(-0.56)	(-0.33)	(-0.87)	(-0.87)	(-1.72)
Merger of equals	-0.10	-0.07	-0.02	-0.10	-0.01	0.01	-0.03
	(-0.98)	(-1.14)	(-0.33)	(-1.65)	(-0.90)	(0.21)	(-1.69)
Tender	0.06	0.02	0.08	0.06	-0.00	-0.02**	-0.02**
	(0.93)	(0.25)	(1.11)	(0.93)	(-0.32)	(-2.54)	(-2.87)
Number of bidders	0.09	0.01	-0.01	0.04	0.01	0.01	0.02*
	(1.79)	(0.28)	(-0.51)	(0.93)	(0.95)	(1.09)	(1.87)
IMR_holding	-0.01*	-0.00	-0.01*	-0.01**	0.00	0.00	0.00
	(-2.26)	(-1.16)	(-2.20)	(-2.95)	(0.91)	(0.29)	(0.51)
IMR_bigbank	0.00**	0.00	0.00***	0.00***	0.00	0.00	0.00
	(2.42)	(0.91)	(4.94)	(4.53)	(1.44)	(0.25)	(0.56)
Activism	-0.04	0.03	-0.01	-0.04	-0.03	-0.05	-0.04
	(-1.36)	(0.28)	(-0.13)	(-0.49)	(-0.93)	(-1.68)	(-1.33)
Constant	-0.24	-0.07	-0.29	-0.35**	-0.07	-0.03	-0.05
	(-1.42)	(-0.64)	(-1.85)	(-2.40)	(-1.64)	(-0.68)	(-0.74)
Adjusted R-sq	0.07	0.06	0.16	0.14	0.09	0.14	0.11
Number of deals	520	519	519	519	517	517	517
Industry, Year, Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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### Appendix B Inverse mills ratio

Tables B1 and B2 report the estimation results for the first-stage probit regressions for hedge funds' holdings in the target and for acquirers' choice of an advisor, respectively, which are used to compute the *IMR\_holding* and *IMR\_bigbank* variable. Consistent with the literature, hedge funds are more likely to hold targets in deals with a higher percentage of cash payment and more mutual fund holdings in the acquirer. The likelihood of an acquirer hiring a large bank as the advisor increases in deal size while it decreases with the target ROE.

Table B1: P	robability o	of hedge funds	to hold a	target
-------------	--------------	----------------	-----------	--------

This table reports the estimation results for the probability of hedge funds to hold an M&A target firm one quarter before the acquisition announcement. Holding > 0 is a dummy variable that equals one if a target has hedge fund holdings.  $Holding_MF_a$  is mutual fund holdings in an acquirer firm one quarter before the acquisition announcement. Other variables are defined in Table 2. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)
	Holding>0
Pctcash	$0.53^{***}$
	(3.83)
Hostile	-0.09
	(-0.20)
Tender	$0.37^{*}$
	(1.71)
Holding_MF_a	1.22**
	(2.43)
Premium	0.10
	(0.59)
ROA_t	-0.92
	(-0.87)
Leverage_t	0.10
	(0.48)
Size_t	0.03
	(0.82)
B/M_t	-0.17
	(-1.28)
Constant	-0.05
	(-0.11)
Pseudo R-sq	0.14
Number of deals	1036
Year FE	Yes

Table B2: Probability of acquirers using a large bank as an advisor

This table reports the estimation results for the probability of acquirers using a large bank as an advisor.  $Big\_bank$  is a dummy variable that equals one if a deal involves a large bank advisor. Other variables are defined in Table 2. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)
	$\operatorname{Big}_{-}\operatorname{bank}$
ln(Deal Value)	0.53***
	(13.79)
Pctcash	0.14
	(1.17)
Hostile	-0.16
	(-0.36)
Holding_MF_a	0.43
	(1.27)
Diff_Ind	-0.06
	(-0.53)
Number of bidders	0.09
	(0.52)
Toehold	-0.01
	(-0.50)
B/M_a	-0.06
	(-0.36)
$\rm B/M_{-}t$	-0.06
	(-0.47)
ROE_t	-0.34**
	(-2.07)
Constant	-4.54***
	(-5.85)
Pseudo R-sq	0.26
Number of deals	931
Year FE	Yes

## Appendix C Probability of adding a new advisor

Table C1 reports the results for the impact of connected fund holdings on the probability of adding a new advisor. It is based only on repeated M&A deals by the same acquirer.

Table C1: Probability of adding a new advisor

This table reports the estimation results of the probit regression in Equation (2), examining the probability of an acquirer adding a new advisor in an M&A deal. The dependent variable is a dummy variable that equals one if an advisor is newly hired by the acquirer for the operation and zero otherwise. *Connected* is a dummy variable that equals one if the potential new advisor is the prime broker of a hedge fund with holdings in the target firm. *Holding\_connected* is the percentage holdings of the potential new advisor's connected hedge funds in the target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	0.46***	
	(9.55)	
Holding_connected		0.15
		(0.09)
Acquisition times	$0.05^{***}$	$0.05^{***}$
	(4.58)	(4.51)
Acquisition value	-0.00	-0.00
	(-0.34)	(-0.46)
Prior advisor	0.36	0.41
	(1.37)	(1.32)
Expertise	$0.31^{***}$	$0.29^{***}$
	(2.69)	(2.76)
IMR_holding	-0.00**	-0.00
	(-2.12)	(-0.88)
Activism	0.08	0.24
	(0.40)	(0.87)
Constant	-3.40***	-3.06***
	(-13.64)	(-9.05)
Pseudo R-sq	0.12	0.10
Number of deals	289	289
Observations	14033	14033
Industry, Year, Advisor FE	Yes	Yes

### Appendix D Deal completion probability

In this appendix we report the results for the impact of connected fund holdings on deal completion probability. To evaluate any potential effects on deal completion probability, we estimate the following probit regression:

$$Pr(Completion^{j}) = \phi(\alpha + \beta Connection\_measure^{j} + \delta Controls^{j})$$
(D1)

where  $Completion^{j}$  equals 1 if deal j is completed.  $Connection\_measure$  is either the dummy variable Connected or the holdings measure  $Holdings\_connected$ . Following Dikova et al. (2010), we control for the total value of the consideration paid by the acquirer in billions of dollars (*Deal Value*) and the amount of the termination fee paid by the acquirer in billions of dollars (*Termination fee*).

Table D1 reports the results. The positive and significant loading on *Holding\_connected* in Column (2) of Table D1 reveal the likelihood of deal completion is increasing in connected funds' holdings. This effect is economically meaningful. A one standard deviation increase in connected hedge fund holdings leads to an increase in the deal's completion probability of 24.33 percentage points, equivalent to about 28% of the average completion probability. Moreover, this effect on completion probability is driven by the holdings of connected funds, as overall hedge fund holdings are not significant.

#### Table D1: Deal completion probability

This table reports the results from Equation (5) for the impact of connected fund holdings on a deal's completion probability. The dependent variable is a dummy variable that equals one if the deal is completed, and zero otherwise. *Connected* is a dummy variable that equals one if a hedge fund's prime broker is also the advisory bank in a deal, and zero otherwise. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	-0.13	
	(-0.90)	
Holding_connected		$11.06^{**}$
		(2.44)
Holding_total	0.32	-0.26
	(0.51)	(-0.40)
Holding_acquirer	-3.64***	-3.73***
	(-3.65)	(-3.77)
Toehold	0.01	0.01
	(0.83)	(0.53)
Deal value	-0.02*	-0.02*
	(-1.86)	(-1.72)
Termination fee	-0.31	-0.27
	(-0.56)	(-0.48)
RELSIZE	-0.09	-0.09
	(-1.07)	(-1.13)
Pctcash	0.03	0.03
	(0.09)	(0.08)
Diff_Ind	0.24	0.24
	(1.45)	(1.44)
Merger of equals	-0.15	-0.23
	(-0.29)	(-0.45)
Tender	$0.36^{***}$	$0.41^{***}$
	(4.07)	(3.91)
Number of bidders	-1.54***	-1.56***
	(-7.09)	(-6.78)
IMR_holding	-0.03**	-0.03**
	(-2.19)	(-2.23)
IMR_bigbank	0.00	-0.00
	(0.05)	(-0.46)
Activism	-1.53***	-1.60***
	(-2.61)	(-2.78)
Constant	$3.68^{***}$	$3.70^{***}$
	(3.80)	(3.88)
Pseudo R-sq	0.31	0.31
Number of deals	672	672
Industry, Year, Advisor FE	Yes	Yes

# Appendix E Premium based on the target market value four weeks before the announcement

Table E1 reports the results for the impact of connected fund holdings on the premium estimated relative to the target market value four weeks before the deal announcement. The interpretation of the results remains qualitatively unchanged from the main paper.

Table E1: Premium based on the target market value 4 weeks before announcement

This table reports the results from Equation (5) for the impact of connected fund holdings on the target premium. The dependent variable is the premium paid estimated relative to the target market value four weeks before the announcement. *Connected* is a dummy variable that equals one if a hedge fund's prime broker is also the advisory bank in a deal, and zero otherwise. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. We use all the other controls as in Table 7, which are not reported for the sake of space. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	-0.12***	
	(-3.81)	
Holding_connected		0.01
		(0.01)
Holding_total	-0.37**	-0.41**
	(-2.84)	(-2.63)
Holding_acquirer	0.02	-0.02
	(0.10)	(-0.09)
Constant	-0.28	-0.27
	(-0.96)	(-0.92)
Adjusted R-sq	0.20	0.19
Number of deals	897	897
Industry, Year, Advisor FE, Controls	Yes	Yes

### Appendix F Probability of insider trading

This appendix reports the estimation results of the probit model for the impact of connected fund holdings on the probability of insider trading. The dependent variable is a dummy that equals one if there is insider trading in a target shares associated with the deal-related information, and zero otherwise. The results indicate no significant relationship between connected (or overall) hedge fund holdings in the target and the probability of insider trading.

#### Table F1: Probability of insider trading

*Connected* is a dummy variable that equals one if the target is held by hedge funds whose prime brokers are also advisory banks in the deal and zero otherwise. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 2 of the main paper. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	0.00	
	(0.00)	
Holding_connected		-0.87
		(-1.38)
Holding_total	0.13	0.17
	(1.16)	(1.38)
Holding_acquirer	-0.13	-0.13
	(-1.64)	(-1.46)
Toehold	-0.00*	-0.00*
	(-1.86)	(-1.98)
ROA_t	0.09	0.08
	(0.32)	(0.34)
Leverage_t	0.02	0.02
	(0.41)	(0.48)
B/M_t	-0.04	-0.04
	(-1.54)	(-1.52)
Size_a	0.01	0.01
	(1.02)	(0.95)
B/M_a	0.00	0.00
	(1.52)	(1.64)
Tangible_t	0.07	0.07
-	(1.26)	(1.30)
RELSIZE	0.04*	0.04*
	(2.14)	(2.13)
Valpet	-0.03***	-0.03***
	(-3.45)	(-4.77)
MFhold	0.06	0.05
	(1.00)	(1.03)
Pctcash	0.05	0.05
	(1.48)	(1.45)
Hostile	0.02	0.01
	(0.25)	(0.25)
Diff_Ind	-0.02	-0.02
	(-1.00)	(-0.99)
Merger of equals	-0.00	0.00
	(-0.04)	(0.05)
Tender	0.09*	0.08*
	(2.18)	(2.30)
Number of bidders	-0.02	-0.02
	(-1.12)	(-1.16)
IMR_holding	0.00	0.00
	(0.76)	(0.73)
IMR_bigbank	0.00	0.00*
	(0.65)	(1.91)
Activism	0.01	0.02
	(0.37)	(0.50)
Constant	0.02	0.01
	(0.21)	(0.11)
Adjusted B-sa	0.09	0.10
Number of deals	897	897
Industry, Year, Advisor FE	Yes	Yes
,	- 00	- 00

# Appendix G Results using pseudo hedge fund-prime broker connections

In this appendix, we repeat the analysis using a pseudo hedge fund-prime broker connection to account for endogeneity. For each hedge fund and each prime broker, we estimate the probability that the fund employs this prime broker, using fund size, domicile, and strategy as explanatory variables. We then assign the pseudo- or estimated connection label to those prime brokers with an estimated probability above the 70th percentile. These fund-level connections are then aggregated to fund-company levels, and we use these estimated connections in all the regressions. Tables G1 to G4 report the results.

Overall, the results using these pseudo-connections are in line with the main results reported in the paper. The advisor's pseudo-connection to hedge funds significantly increases the likelihood of the advisor being selected. A firm is more likely to be chosen as target if it has pseudo-connected hedge fund holdings. Pseudo-connected funds significantly reduce their holdings in targets both before and after the announcement, as well as their implied holdings in the bidder after deal completion. The pseudo-connected hedge fund holdings significantly reduce the premium for targets with higher information asymmetry levels. There is also some evidence that for deals involving targets with high information asymmetry, TCAR decreases and ACAR increases in connected hedge fund holdings. Overall, all these results point towards an information flow pattern consistent with the 'indirect toehold' scenario.

Table G1: Choice of the advisor: pseudo hedge fund-prime broker connections

This table reports the results from Equation (1), examining the acquirer's choice of advisors in M&As using pseudo hedge fund-prime broker connections. The dependent variable is a dummy variable that equals one if an advisor is hired by the acquirer for the deal, and zero otherwise. *Connected* is a dummy variable that equals one if an advisor is the prime broker of a hedge fund with holdings in the target firm, and zero otherwise. *Holding\_connected* is the percentage holdings of an advisor's connected hedge funds in the target firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	0.34***	· · ·
	(4.06)	
Holding_connected	. ,	1.45***
		(4.26)
Acquisition times	$0.04^{***}$	0.05***
	(9.48)	(6.97)
Acquisition value	-0.00	-0.00
	(-0.51)	(-0.56)
Prior advisor	1.11***	1.13***
	(5.17)	(5.29)
Expertise	0.22**	0.22**
	(2.20)	(2.36)
IMR_holding	-0.00	-0.00
	(-0.54)	(-0.89)
$IMR_bigbank$	$0.00^{***}$	0.00***
	(7.70)	(8.37)
Activism	-0.03	-0.03
	(-0.17)	(-0.14)
Constant	-2.92***	-3.01***
	(-19.55)	(-14.12)
Pseudo R-sq	0.12	0.11
Number of deals	897	897
Observations	44776	44776
Industry, Year FE	Yes	Yes

Table G2: Choice of the target: pseudo hedge fund-prime broker connections

This table reports the results from Equation (3), examining the acquirer's choice of targets in M&As using pseudo hedge fund-prime broker connections. The dependent variable is a dummy variable that equals one if a firm is chosen to be the target, and zero otherwise. *Connected* is a dummy variable that equals one if a firm is held by hedge funds whose prime broker is the advisor, and zero otherwise. *Holding\_connected* is the percentage holdings of an advisor's connected hedge funds in the firm one quarter before the acquisition announcement. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Connected	1.49***	
	(22.06)	
Holding_connected		8.55***
		(10.19)
Size	-0.11***	$0.01^{***}$
	(-8.49)	(2.81)
B/M	-0.00***	-0.00***
	(-5.24)	(-3.55)
ROE	$0.01^{***}$	$0.01^{*}$
	(3.36)	(1.96)
Leverage	0.07	0.07
	(1.13)	(1.21)
Tangible	-0.01	-0.05
	(-0.10)	(-0.79)
Liquidity	-0.01**	-0.01
	(-2.04)	(-1.61)
sales	0.00	0.00
	(0.59)	(0.30)
P/E	-0.00	-0.00
	(-1.34)	(-0.62)
IMR_holding	$0.00^{***}$	0.00
	(5.24)	(1.46)
$\mathrm{IMR}_{\mathrm{bigbank}}$	-0.01***	-0.00***
	(-16.77)	(-5.07)
Activism	0.00	-0.03
	(0.05)	(-0.74)
Constant	-0.72***	-0.81***
	(-2.83)	(-4.53)
Pseudo R-sq	0.11	$0.\overline{05}$
Number of deals	658	658
Observations	3592	3592
Industry, Year, Advisor FE	Yes	Yes

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Table G3: Changes in hedge fund holdings: pseudo hedge fund-prime broker connections

This table reports the results from Equation (4) for the changes in the hedge fund holdings in a target or acquirer and the changes in shares of the target or acquirer in the hedge fund portfolio. Panel A reports the results for the changes in target holdings/shares one quarter before (t-1) and one quarter after (t+1) the deal announcement. Panel B reports similar results for holdings/shares in bidders. Panel C reports the changes in implied holdings/shares in bidders from one quarter before the deal announcement to deal completion (denoted by q), and during the first quarter after the completion (denoted by q + 1). Connected is a dummy variable that equals one if a hedge fund's pseudo prime broker is also the advisory bank in a deal, and zero otherwise. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Changes in holdings/shares in target around announcement				
	(1)	(2)	(3)	(4)
	$\Delta Holding_{t-1}$	$\Delta Holding_{t+1}$	$\Delta Shares_{t-1}$	$\Delta Shares_{t+1}$
Connected	-0.02**	-0.02	$0.05^{*}$	-0.11**
	(-2.12)	(-1.44)	(1.91)	(-2.06)
Constant	-0.04	-0.54	-0.09	0.01
	(-0.43)	(-1.62)	(-1.62)	(0.10)
Adjusted R-sq	0.05	0.20	0.27	0.33
Number of deals	931	641	931	641
Observations	32327	24037	32327	24037
Deal and Fund FE	Yes	Yes	Yes	Yes

Panel B: Changes in holdings/shares in bidder around announcement

	$\Delta Holding_{t-1}$	$\Delta Holding_{t+1}$	$\Delta Shares_{t-1}$	$\Delta Shares_{t+1}$
Connected	-0.00	0.00	-0.01	-0.03
	(-0.54)	(0.13)	(-0.29)	(-0.76)
Constant	0.05	-0.05	-0.00	0.01
	(0.90)	(-0.61)	(-0.05)	(0.29)
Adjusted R-sq	0.03	0.04	0.16	0.10
Number of deals	895	615	895	615
Observations	53288	31874	53288	31874
Deal and Fund FE	Yes	Yes	Yes	Yes

Panel C: Changes in holdings/shares in bidder after completion

	0	01	-	
	$\Delta Holding_q$	$\Delta Holding_{q+1}$	$\Delta Shares_q$	$\Delta Shares_{q+1}$
Connected	-0.018***	-0.004	-0.098***	-0.012
	(-4.473)	(-1.587)	(-4.215)	(-1.141)
Constant	-0.032	$0.026^{**}$	-0.060**	$0.032^{**}$
	(-1.299)	(2.409)	(-2.004)	(2.230)
Adjusted R-sq	0.05	0.03	0.08	0.05
Number of deals	812	812	812	812
Observations	88817	88817	85447	88817
Deal and Fund FE	Yes	Yes	Yes	Yes

# Table G4: Target premium, and abnormal returns: pseudo hedge fund-prime broker connections

This table reports the results from Equation (5) for the impact of connected fund holdings on target premium and abnormal returns considering the information asymmetry of targets using pseudo hedge fund-prime broker connections. *Premium* is the premium paid one week before the announcement. *TCAR* and *ACAR* are the cumulative abnormal returns on target and acquirer shares over an event window of [0], [-1,1], and [-5,5], respectively. *Holding\_connected* (*Holding\_total*) are the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. *highIA* equals one for high information asymmetry targets, and zero otherwise. Other variables are defined in Table 2. Robust standard errors are reported in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	-
	Premium	TCAR	TCAR[-1,1]	TCAR[-5,5]	ACAR	ACAR[-1,1]	ACAR[-5,5]	
Holding_connected $\times$ highIA	-1.18**	-0.39	-0.57	-0.69**	0.05	0.11*	-0.05	-
0	(-2.40)	(-1.20)	(-1.63)	(-2.44)	(1.37)	(1.87)	(-0.42)	
Holding_connected	0.12	-0.12	-0.19	-0.19	0.01	0.07	0.06	
0	(0.24)	(-0.51)	(-0.54)	(-0.61)	(0.24)	(1.25)	(1.80)	
highIA	0.14***	0.06*	0.12***	0.10**	0.02*	0.02	0.02*	
0	(4.77)	(1.93)	(3.44)	(2.63)	(1.96)	(1.24)	(1.94)	
$Holding_total \times highIA$	-0.24	0.02	-0.04	-0.03	-0.06	-0.10	-0.11	
00	(-1.29)	(0.10)	(-0.18)	(-0.10)	(-1.32)	(-1.09)	(-1.36)	
Holding total	-0.14	-0.14	-0.11*	-0.14**	0.04	0.04	0.06**	
8	(-1.13)	(-1.50)	(-1.98)	(-2.31)	(1.82)	(1.71)	(2.88)	
Holding acquirer	0.01	0.06	0.02	0.01	-0.02	0.05	0.04	
Trotaing-acquirer	(0.07)	(0.70)	(0.19)	(0.09)	(-0.45)	(0.79)	(0.48)	
Toehold	-0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	
10011014	(-1.62)	(0.09)	(-1.48)	(-0.92)	(1.13)	(0.09)	(-0.46)	
BOA t	-1 11***	-0 45***	-0.59***	-0.61***	0.06	0.01	0.09	
1001110	(-13 55)	(-5.96)	(-5.63)	(-7.09)	(0.90)	(0.08)	(1.00)	
Leverage t	0.01	0.00	0.01	-0.01	0.01	-0.00	-0.02	
Leverage_0	(0.20)	(0.01)	(0.24)	(-0.23)	(1.49)	(-0.21)	(-1.11)	
B/M t	0.05**	0.02	-0.00	0.00	-0.01**	-0.01	-0.01	
D/ Will	(2.52)	(0.02)	(-0.11)	(0.04)	(-2.98)	(-1.25)	(-1.48)	
Sizo	0.04**	0.02***	0.04***	0.04***	0.00	0.00	0.00	
Jize_a	(2.80)	(6.34)	(8.01)	(6.65)	(0.57)	(0.00)	(0.10)	
B/M a	(2.00)	0.00	0.00**	0.00**	0.00**	0.00	0.00	
D/ M_a	(0.55)	(0.12)	(2.46)	(2.58)	(2.76)	(0.45)	(0.28)	
Tangihla t	(0.55)	0.07**	(2.40)	0.06**	(-2.70)	(0.45)	0.01	
Tangible_t	(0.82)	(9,40)	(2,50)	(2.80)	(0.14)	-0.02	-0.01	
DELSIZE	(0.82)	(2.40)	(2.59)	(2.69)	(-0.14)	(-0.02)	(-0.23)	
RELSIZE	(1.12)	(1.97)	-0.00	-0.01	(1.07)	-0.01	-0.01	
Valuet	(-1.13)	0.02*	(-0.47)	(-1.00)	(-1.07)	(-0.99)	(-1.23)	
vaipet	(1.08)	(2.10)	(0.00)	(0.01	(0.42)	(1.25)	(0.46)	
MEhold	(1.96)	(2.19)	(0.99)	(0.95)	(0.45)	(1.55)	(0.40)	
MFIIOID	-0.10	-0.07	-0.09	-0.12	(0.52)	-0.01	-0.00	
Deteash	(-1.63)	(-0.03)	(-0.92)	(-1.62)	0.02***	(-0.33)	(-0.20)	
Fetcasii	-0.07	-0.01	0.05	(0.05	(4.04)	(2.20)	(2.10)	
Heatile	(-1.21)	(-0.13)	(0.85)	(0.87)	(4.04)	(3.32)	(2.10)	
nostile	(0.07)	(0.00)	(1.42)	(1.44)	(0.01)	(0.60)	(0.45)	
Diff Ind	(0.97)	(0.80)	(1.42)	(1.44)	(0.77)	(0.60)	(0.45)	
Din_ma	0.01	(0.02	-0.00	-0.00	-0.00	-0.00	-0.01	
Manuar of a mode	(0.00)	(0.08)	(-0.13)	(-0.25)	(-0.17)	(-0.02)	(-1.42)	
Merger of equals	-0.11	(157)	-0.04	-0.10	-0.01	(0.02)	-0.02	
Tondon	(-1.08)	(-1.57)	(-0.04)	(-1.75)	(-0.40)	(0.05)	(-1.20)	
lender	0.04	-0.00	0.02	(0.20)	(0.68)	-0.00	0.00	
Noushan af hiddaus	(0.75)	(-0.15)	(0.32)	(0.59)	(0.08)	(-0.24)	(0.21)	
Number of bidders	(0.01)	-0.01	-0.04	-0.00	(0.57)	(0.01	(0.01)	
MD hallen	(2.81)	(-0.42)	(-1.89)	(-0.06)	(0.37)	(0.66)	(0.91)	
IMR_nolding	-0.01	-0.00	-0.00	-0.00	(0.00	0.00	0.00	
IMD high cal	(-1.85)	(-0.97)	(-1.40)	(-1.52)	(3.37)	(1.19)	(1.35)	
IMR_Digbank	(1.50)	(0.70)	$(0.00^{\circ})$	$(0.00^{-1})$	-0.00	-0.00	-0.00	
A	(1.50)	(0.78)	(2.17)	(2.46)	(-1.34)	(-0.59)	(-0.31)	
Activism	0.10	-0.01	-0.03	-0.04	-0.02	-0.03	-0.01	
	(1.29)	(-0.23)	(-0.44)	(-0.47)	(-0.69)	(-1.77)	(-0.28)	
Constant	-0.08	-0.09	-0.03	-0.08	-0.05	-0.05	-0.07	20
	(-0.33)	(-1.30)	(-0.38)	(-0.70)	(-1.84)	(-1.14)	(-1.22)	-
Adjusted K-sq	0.15	0.13	0.23	0.22	0.08	0.11	0.07	
Number of deals	897	896	896	896	893	893	893	
Industry, Year, Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	_