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Advisor- hedge fund connections and their role in M&A

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Abstract

This paper examines the impact of investment banks' connection with hedge funds on acquirer firms' choice of advisor and deal outcome in M&A. We find that acquirers are more likely to choose advisors whose connected hedge funds have holdings in the target one quarter before the deal announcement. Those holdings increase the likelihood of deal completion and are negatively related to the premium paid to the target and target abnormal returns when targets have higher degrees of information asymmetry. These results support our 'indirect toehold' hypothesis.

Keywords: Choice of advisor; relationship banking; hedge fund holdings; indirect toehold; information advantage; merger and acquisitions.

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1 Introduction

Mergers and acquisitions (M&A) are among the most important corporate events bringing substantial resource re-allocations within the economy. According to IMAA analysis, in 2015 alone, when the most recent merger wave peaked, the total transaction value of US M&A reached \$2545 billion. A common characteristic of these transactions is that they usually involve financial advisors. For instance, on average, over 84% (by transaction value) of deals between 1990 and 2020 have been facilitated by an advisory firm (see Figure 1). Activist hedge funds now also play a significant role in M&A. According to data from Activist Insight, 839 companies were targeted by at least one activist hedge fund in 2019, including 21% with a market capitalization exceeding US\$10 billion.¹

[Figure 1 in here]

Our paper examines the connections between advisors and hedge funds and how these connections influence the choice of an advisor in M&A and deal outcome. We say that a hedge fund is connected to the investment bank (that serves as the advisor in M&A deal) if the hedge fund uses this bank as a prime broker. We develop two hypotheses concerning the direction of information flow between advisors and connected hedge funds. The ‘indirect toehold’ hypothesis posits that advisors use connected hedge funds’ holdings in the target firm as an ‘indirect toehold’ to obtain additional information about the target and help the bidder. The ‘information advantage’ hypothesis posits that connected hedge funds gain privileged information from the advisor and increase stakes in target firms before the M&A announcement. Using a sample of 1,199 US mergers

¹Mark DesJardine and Rodolphe Durand. Does hedge fund activism impact the long-term sustainability of companies? Principles for Responsible Investment. June 22, 2020.

of public companies with hedge fund holdings in the target firm between 2000 to 2019, we find that acquirers are more likely to choose the investment bank whose connected hedge funds have holdings in the target firm. The conditional probability of a bank is selected given that it has a hedge fund connection is 0.975, while the number given it doesn't have such a relationship is 0.013. We find that connected hedge funds do not show any significant changes in their position in target or acquirer firms before the deal announcement compared to unconnected funds. Hence, there is no evidence that advisors share their private information about the deal with their connected funds. However, connected funds' holdings in the target firm increase the likelihood of deal completion and are associated with significantly lower target premium and smaller target abnormal returns on the announcement date, especially for target firms with higher degrees of information asymmetry. This finding suggests that the investment bank that advises the bidder may benefit from information supplied by connected hedge funds, supporting our 'indirect toehold' hypothesis. This may help the bidder gather relevant information about the target, reduce information asymmetry, and enhance its bargaining power. At the same time, affiliated funds holdings do not affect deal duration, the period between the announcement and deal effective dates.

As such, we contribute to the literature on the role of advisors in M&A. The role of merger advisors and their impact on merger outcomes has received much attention in the literature, but the findings are mixed. Theoretically, investment banks help to execute complex deals that are characterized by significant asymmetric information and reduce transaction costs (Servaes and Zenner, 1996). Empirically, they lead to higher shareholder wealth gains (Kale et al., 2003), M&A returns (Bao and Edmans, 2011; Golubov et al., 2012), and probability of completion (Hunter and Jagtiani, 2003). However, other studies find no association between an advisor's quality and M&A outcomes (Rau, 2000; Hunter and Jagtiani, 2003; Ismail, 2010).

Allen et al. (2004) find evidence that commercial banks have a comparative advantage relative to investment banks in serving as M&A advisors, i.e. ‘a certification role’, and this effect hold for the target firms only. Song et al. (2013) show that boutique advisors are more likely to be used in complex deals, and acquirers hiring boutique advisors tend to pay lower premiums.

Bodnaruk et al. (2009) study the insider role of the advisory bank and find that investment banks exploit information gained as advisors to take stakes in target firms before the deal announcement, which is highly profitable. Their stakes are positively related to bid prospects and to the size of the premiums paid for targets. Our findings suggest that advisors act as information transmitters from hedge funds to bidders.

Recent literature investigates factors affecting the choice of advisors and their effects on shareholder wealth. Sibilkov and McConnell (2014) show that prior performance is a significant determinant of whether an investment bank will be chosen as the advisor by future acquirers. It is also positively associated with the advisors’ market values changes, which is positively related to acquirers’ announcement returns. Francis et al. (2014) find that prior client relationships, the reputation of the advisor, and deal complexity are the main factors. Chang et al. (2016) find that advisor’s industry expertise and firms’ concern about information leakage to industry rivals are strong determinants of advisor choice for firms in M&A. Forte et al. (2010) focus on target’s choice of advisor and show that the probability of hiring the bank with which a firm has a strong prior relationship is influenced by the intensity of the previous banking relationship, the reputation of the bidder’s advisor, and the complexity of the deal. Our findings show that advisors’ connection with hedge funds that have holdings in the target firm is a significant determinant of acquirer firms’ choice of advisor.

Our study contributes to the literature on the impact of information asymmetry in

acquisitions and the division of gains between firms. During an extensive due diligence process, the bidder can gather superior information about the target and is likely to exploit this information advantage during the M&A negotiation process strategically. Acquirer returns are significantly higher in stock-swap acquisitions of difficult-to-value targets (Officer et al., 2009). A target with more information asymmetry receives a more significant bid premium from the acquirer, and the acquirer’s investors respond more positively to the acquisition of an opaque target (Cheng et al., 2016). Acquirers strategically exploit their superior bargaining power and are more likely to offer cash payments and earn a more significant fraction of total M&A gains if the target is characterized by higher information asymmetry (Luypaert and Van Caneghem, 2017). Acquirers gain higher when they employ financial advisors in private offers, whereas the opposite is true for public deals (Leledakis et al., 2021). We show that advisors’ connected fund holdings in the target firm are also a source of information for acquirers and help the bidder gain more bargaining power.

Our paper is also related to the role of toeholds (prebid ownership of target share) in acquisitions. Bidders usually use toeholds to yield an information advantage over rivals, which positively affects their profits. Betton and Eckbo (2000) and Bris (2002) find that the probability of being taken over, the takeover premium, and pre-bid increase 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 it is more beneficial if a target is opaque. Our results indicate that advisors’ connected fund holdings can work as an ‘indirect toehold’ and create an informational advantage.

Our analysis also contributes to a growing literature investigating the relationship

between hedge funds and their prime brokers and the potential information flow from prime brokers to hedge funds. For instance, [Chung and Kang \(2016\)](#) find that hedge funds sharing prime brokers exhibit a strong co-movement in returns, often attributable to information flows initiated by the common broker. Similarly, [\(Kumar et al., 2020\)](#) document evidence that information regarding corporate client loans disseminates from prime brokers to hedge funds. [Qian and Zhong \(2018\)](#) find that IPO stocks with abnormally high hedge funds holdings yield abnormal returns, and hedge funds earn higher abnormal returns from this when their prime brokers also serve as IPO underwriters. We contribute to the literature by pointing toward the reverse direction of information flow. Our results indicate that there is also information flow from connected hedge funds to their prime brokers, who also advise the bidders in M&A.

Finally, our paper extends the literature on the role and impact of hedge funds in the M&A market. [Boyson et al. \(2017\)](#) find that hedge fund activist interventions substantially increase the probability of a takeover offer and enhance shareholder value. Similarly, [Wu and Chung \(2021\)](#) show that hedge fund activism improves firms' M&A decisions, and investors favourably receive such post-activism acquisitions. On the contrary, targets with agency problems and the threat of investor coordination often engage in hostile resistance, which leads to adverse outcomes unless hedge funds counter resist ([Boyson and Pichler, 2019](#)). Few studies investigate the short-term nature of hedge fund holdings and their impact on M&A. [Gao et al. \(2018\)](#) provide evidence that pre-transaction hedge-fund holdings in the target firm increase the proportion of cash payment while having no effects on the deal premium. [Dai et al. \(2017\)](#) show that hedge funds use nonpublic information to take long positions in M&A target stocks and short positions in acquirer stocks before a M&A announcement, and their stakes in targets are positively related to the target takeover premium. Our paper highlights how hedge funds may potentially gather target-related private information through their 'indirect toehold' and

then transmit it to the bidder via a connected advisory firm.

2 Research Design

This section develops testable hypotheses relating to the choice of merger advisors and their effects on deal outcomes. To provide context, we introduce two competing hypotheses concerning the direction of information flow in M&A, then discuss how this affects the choice of advisors, changes in hedge fund holdings, deal duration, deal completion, target premium, and cumulative abnormal returns.

Figure 2 illustrates the direction of information flow between advisors and hedge funds in M&A. First, the ‘indirect toehold hypothesis’ posits that merger advisors that also provide prime brokerage service to hedge funds use connected hedge funds’ holdings in the target firm as an ‘indirect toehold’ to obtain additional information about the target and help the bidder. Therefore, the information flows from targets to hedge funds then advisors and finally acquirers. Hansen (1987) argues that a lemons problem arises in M&A transactions when targets possess proprietary information about their own value. Bidders can mitigate information asymmetry in several ways, including pay a lower purchase price (Makadok and Barney, 2001), pay with stock (Hansen, 1987, Finnerty et al., 2012), and use financial advisors (Officer, 2007, Leledakis et al., 2021). In particular, financial advisors use their expertise to collect superior information for the potential targets and identify any synergetic benefits. The advisors also have the incentive to help the bidder and charge advisory fees. In addition, toehold is also a source of information for bidders that helps them improve their information about possible synergies with the target (Povel and Sertsios, 2014). However, a toehold purchase may also create rumors of a pending bid that can result in a pre-bid run-up that increases the offer price (Ravid and Spiegel, 1999)

and a target rejection of negotiation (Betton et al., 2009). Therefore, advisors' connected fund holdings in the target can be a valuable source of information for acquirers, and such indirect access to information may have lower costs than a direct toehold.

In this case, we expect acquirers to be more likely to choose advisors whose connected hedge funds have holdings in the target. The reduced information asymmetry between target and bidder also reduces deal duration, increases the likelihood of acquisition completion, and gives acquirers more bargaining power. As a result, the premium paid can be reduced, leading to lower target abnormal returns on the acquisition announcements. The effect can be expected more pronounced for targets with higher degrees of information asymmetry, for which the margin benefit of information asymmetry reduction is higher.² However, connected funds will get a smaller gain from the holdings in target firms and are not likely to increase their holdings. Thus, we expect that relative to unconnected funds, connected funds do not change or decrease their holdings in target firms before the acquisition announcements.

Alternatively, the 'information advantage' hypothesis posits that connected hedge funds may gain privileged information from the advisory bank and earn superior returns by taking a position in the target firm and expecting its share price to increase around the time of M&A announcement. Therefore, the information flows from acquirer to advisors and finally connected hedge funds. Qian and Zhong (2018) examine hedge funds' investment in new public stocks and find that connected hedge funds obtain information advantages from their prime brokers. The latter also serve as underwriters and earn significantly higher returns. Bodnaruk et al. (2009) document that financial conglomerates in which affiliated investment banks advise the bidders to increase the

²Advisory banks may compensate connected hedge funds through the services they provide. As shown in Kumar et al. (2020) and Qian and Zhong (2018), hedge funds may benefit from mutual information flow between them and their prime broker.

positions in targets before M&A announcements which enhances the probability of deal success and is highly profitable. Applying the same reasoning to connected hedge funds, if information flows from advisory banks to hedge funds with prime brokerage connections, those funds will exploit this information by taking a position in the target firm before the announcement and realizing the gain around the M&A announcement.

In this case, acquirers are not likely to choose advisors whose connected hedge funds have holdings in the target. Relative to unconnected funds, connected funds should increase their holdings in target firms before the acquisition announcements to gain abnormal returns. Those funds also have the motivation to facilitate the deal, reduce the deal duration, and increase the likelihood of deal completion. Connected hedge funds may try to directly affect the merger outcome, e.g., voting on the shareholder meetings, to realize capital gains from their positions. Connected fund holdings should predict higher target premiums and higher cumulative abnormal returns if this is the case. The above analysis leads to the following two sets of hypotheses:

'indirect toehold' hypothesis:

H1(a) Acquirers are more likely to choose advisors whose connected hedge funds have holdings in target firms.

H2(a) Relative to unconnected funds, hedge funds, connected to the advisory bank, do not increase their holdings in target firms before M&A announcements.

H3(a) Connected funds' holdings in targets before the acquisition announcement lead to:

(1) a shorter deal duration;

(2) a lower takeover premium;

(3) lower target announcement returns.

H4 The above effects are stronger when target firms have higher degrees of information asymmetry.

'information advantage' hypothesis:

H1(b) Acquirers are not likely to choose advisors whose connected hedge funds have holdings in target firms.

H2(b) Relative to unconnected funds, hedge funds, connected to the advisory bank, increase their holdings in target firms before M&A announcements.

H3(b) Connected funds' holdings in targets before the acquisition announcement lead to:

(1) a shorter deal duration;

(2) a higher takeover premium;

(3) higher target announcement returns.

[Figure 2 in here]

To tests these hypotheses, we estimate the following regression models:

$$p_{i,j} = \alpha + \beta_1 \text{Connected}_{i,j} + \beta_2 \text{Holding}_{i,j} + \beta_3 \text{Connected}_{i,j} \cdot IA + \beta_4 \text{Holding}_{i,j} \cdot IA + \delta \text{Controls}_{i,j} + \eta_{i,j} \quad (1)$$

$$\Delta \text{Holding_connected}_{t-1}^i = \alpha + \beta \Delta \text{Holding_unconnected}_{t-1}^i + \delta \text{Controls}_{t-1}^i + \epsilon_t^i \quad (2)$$

$$\text{Duration/Premium/TCAR/ACAR}^i = \alpha + \beta \text{Holding_connected}_{t-1}^i + \delta \text{Controls}_{t-1}^i + \epsilon^i \quad (3)$$

$$\text{Completion}^i = \begin{cases} 1, & \text{if } \text{Completion}_{L^*}^i > 0, \text{ the deal is completed;} \\ 0, & \text{otherwise.} \end{cases} \quad (4)$$

$$\text{Completion}_{L^*}^i = \alpha + \beta \text{Holding_connected}_{t-1}^i + \delta \text{Controls}_{t-1}^i + \epsilon^i \quad (5)$$

We use a logit regression to test the choice of advisor hypothesis. $p_{i,j}$ is the probability that an advisor i is hired for a particular deal j . For an advisor to enter the estimation, the advisor must have been the advisor in at least one acquisition during the past year before

the announcement of the current acquisition. $Connected_{i,j}$ is a dummy variable that equals one if an advisor i is the prime broker of a hedge fund with holdings in the target firm in acquisition j and zero otherwise. $Holding_{i,j}$ is the percentage holdings of advisor i 's connected hedge funds in the target firm in acquisition j . In our sample, we identify 13 connected advisors, including 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, and Barclays plc while the number of unconnected advisors is 155.

IA represents the information asymmetry measure using five variables based on [Karpoff et al. \(2013\)](#), [Cheng et al. \(2016\)](#) and [Borochin et al. \(2019\)](#): $Amihud$ is the average Amihud illiquidity measure over the year prior to the acquisition announcement; $Size$ is the natural logarithm of the book value of total assets in the year prior to the acquisition announcement; Age is the number of years between the firm's IPO year and the year prior to the acquisition announcement; COV is the number of analysts for the target in the year before the acquisition announcement; ERR is the ratio of the absolute difference between the forecast earnings and the actual earnings per share to the price per share in the year before the acquisition announcement. Analysts' earnings forecasts come from I/B/E/S. We assign a target an additional risk point for each measure of $Amihud$ and ERR which lies above the median, and of $Size$, Age and COV which is below the median. A target is designated to be of high information asymmetry if the sum of its risk points is above the median. On this basis, we classify 515 targets in our sample as high information asymmetry targets.

In choosing the other control variables, we follow [Sibilkov and McConnell \(2014\)](#): $Acquisition\ times$ is the number of times an advisor served as an acquirer's advisor one year before the acquisition announcements; $Acquisition\ value$ is the logarithm of the

total value of all acquisitions that an advisor served as an acquirer’s advisor one year before the acquisition announcements; *Prior advisor* equals one if the advisor served as a M&A advisor for the acquirer one year before the acquisition announcements and zero otherwise; *Expertise* equals one if the advisor served as an acquirer’s advisor in an acquisition that involved a target from the same two-digit SIC industry as the target of the current acquisition and 0 otherwise. We also include the Inverse Mills Ratio (*IMR*) in all equations to account for a possible selection bias. The probit analysis employs all target firm observations and the dependent variable equals one if hedge funds have holdings in a target firm.

In Equation 2, $\Delta Holding_connected_{t-1}^i$ ($\Delta Holding_unconnected_{t-1}^i$) is the change in connected (unconnected) fund holdings per fund of stock i in quarter $t-1$ (the difference between quarter $t-1$ and $t-2$), where the holdings of stock is measured as the total number of shares owned by hedge funds scaled by the total shares outstanding. We define a fund as a connected fund if the advisory bank is the prime broker of a hedge fund.

We also control for the changes of holdings of connected and unconnected funds in quarter $t-2$ ($\Delta Holding_connected_{t-2}^i$ and $\Delta Holding_unconnected_{t-2}^i$) and hedge funds’ holdings in the acquirer ($Holding_acquirer_{t-1}$). In choosing the other control variables, we follow Bodnaruk et al. (2009) and Gao et al. (2018): *Return on asset_t* (ROA_t) is the return on asset of a target firm in the last fiscal year before the acquisition announcement; *Leverage_t* is the equity-to-assets ratio of a target firm in the last fiscal year before the acquisition announcement; B/M_t is target’s book-to-market value of equity measured in the last fiscal year before the acquisition announcement; *Tangible_t* is target’s ratio of total tangible assets to total assets in the last fiscal year before the acquisition announcement; $Size_a$ is the logarithm of acquirer’s market capitalization in the last fiscal year before the acquisition announcement; B/M_a is acquirer’s book-to-market

value of equity min the last fiscal year before the acquisition announcement; *RELSIZE* is the ratio of target total assets to bidder total assets; *Valpct* is the ratio of deal value to acquirer market capitalization in the last fiscal year before the acquisition announcement; *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 are considering their merger a merger of equals; *Dif find* 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.

In Equation 3, *Duration* is calculated as the number of months between the announcement date and deal effective date; *Premium* is the premium existing one week (four weeks) before acquisition announcement measured by the premium of the offer price to target closing stock price; *TCAR (ACAR)* is the cumulative abnormal returns (CARs) for target (acquirer) firms on the acquisition announcement date, computed using the event study method developed by [Brown and Warner \(1985\)](#). We use the CRSP value-weighted return as the market return and estimate the market model parameters over the 200 trading days ending two months before the merger announcement following [Cai and Sevilir \(2012\)](#). We use a logit regression for deal completion. $Completion^i$ equals 1 if deal i is completed. $Completion_{L*}^i$ is a latent variable that depends on a set of explanatory variables. The error term η^i follows a logistical distribution. The key variable of interest is $Holding_connected_{t-1}^i$, which represents the total holdings of all connected hedge funds in target firm i in quarter $t-1$. We also control for the total holdings of hedge funds in a target firm in quarter $t-1$ ($Holding_total_{t-1}$) and hedge funds' holdings in the acquirer ($Holding_acquirer_{t-1}$).

For the duration and completion, we further control for the following variables, following [Dikova et al. \(2010\)](#): *Deal Value* is the total value of the consideration paid by the acquirer in a million dollars; *Termination fee* is the amount of the termination fee paid by the acquirer in a million dollars. The other control variables are defined in Equation (2). In Equations (2), (3), and (5), we also include target industry fixed effects, advisor fixed effects and use robust standard errors. Table 1 summarizes all the variable definitions we use in this paper. To capture the effect of information asymmetry on changes in hedge fund holdings and deal outcome, we first estimate Equations (2), (3), and (5) using all deals and then separate deals into sub-samples with higher and lower target information asymmetry.

[Table 1 in here]

Under the ‘indirect toehold’ hypothesis, we expect β_1 , β_2 , β_3 and β_4 to be positive in Equation (1), indicating that acquirers are more likely to choose the advisor whose connected hedge funds have holdings in the target firms and the effects are stronger for targets with higher degrees of information asymmetry. We expect β lower than 1 in Equation (2), indicating that connected funds do not increase the holdings in target firms compared to unconnected funds before the acquisition announcements. We expect β to be negative in Equation (3) and positive in Equation (5), suggesting that connected hedge funds holdings lead to shorter deal duration, lower target premium, lower target abnormal returns, but higher completion probability. The β coefficients in equations (2), (3), and (5) shall be more significant when using targets with higher degrees of information asymmetry.

Under the ‘information advantage’ hypothesis, we expect β_1 and β_2 to be negative in Equation (1), indicating that acquirers are less likely to choose the advisor whose

connected hedge funds have holdings in the target firms. We expect β to be positive and larger than 1 in Equation (2), indicating that connected funds increase the holdings in target firms compared to unconnected funds before the acquisition announcements. In Equations (3) and (5), we expect β to be negative for the duration and positive for completion, premium, and abnormal returns, indicating that connected funds' holdings in the target firm reduce the deal duration, increase the likelihood of deal completion, and are positively related to the target premium and abnormal returns.

3 Data

We use three sets of data: (1) a sample of hedge funds 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.

Our hedge fund sample is from the TASS and EurekaHedge databases from January 1994 to September 2019, which include information on affiliated companies. Hedge fund investment companies registered in the U.S. 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 and Kolokolova \(2021\)](#). In total, we have 5,713,269 data points of holdings (a hedge fund company-quarter-security uniquely defines each data point), and 691 hedge fund companies held at least one of the target firms one quarter before the deal announcement in our sample.

Our sample of acquisition is from the Eikon database. These acquisitions were

announced between January 2000 to September 2019. We apply the following filters commonly used in the prior M&A literature (see [Boyson et al., 2017](#); [Dai et al., 2017](#); [Wu and Chung, 2021](#)). (1) disclosed deal value greater than USD 1 million; (2) the acquirer owns less than 50% of the target stock before the acquisition and seeks to own 100% of a target’s shares; (3) exclude spin-offs, repurchases, and self-tenders; (4) both the bidder and the target are U.S. public firms listed on NYSE or Nasdaq, as the data on hedge fund holdings are available only for U.S. listed firms.³ The initial sample contains 2681 deals. We use only those deals for which all the necessary variables for our baseline analysis can be computed using the data from CRSP and Compustat⁴ and deals with hedge fund holdings in the target firm. The final sample includes 1,199 deals. We use the target primary ticker symbol to match the firms in our M&A sample to the companies included in hedge-fund holdings.

Table 2 reports the descriptive statistics of characteristics for advisors. Panel A reports the statistics for connected and unconnected advisors, respectively. Overall, there are 155 unique advisors in our sample, of which 13 have a hedge fund connection. On average, connected advisors advise more deals than unconnected advisors (57.538 versus 4.807) and larger deal value (519.880 versus 20.698 billion dollars). In Panel B, we look at all potential combinations: for each deal, we include the chosen advisors and other potential advisors that are not chosen but active in the advisory market. Hence, there are 58,761 advisors in total, and many are not-chosen advisors. The conditional probability of a bank is selected given that it has a hedge fund connection is 0.975, while the number given it doesn’t have such a relationship is 0.013. On average, connected advisors also have higher numbers and values of prior acquisitions (12.469 and 99.634 billion dollars

³This filter gives us a clear sample as we calculate the holdings of hedge funds both in the target and acquirer. Hedge funds may have holdings for other companies, but it is not observed.

⁴The largest loss of data 993 and 212 deals is driven by the absence of information on target ROA and tangible assets, respectively.

versus 3.483 and 23.832 billion dollars). They are more likely to be the previous advisor of the acquirer in the past year (0.056 versus 0.003) and advise a target in the same industry as the target of the current acquisition (0.322 versus 0.129). Panel C reports the advisor statistics for deals with and without connected fund holdings, respectively. The average number of advisors is 1.844 for deals with connected fund holdings and 0.788 for deals without. On average, 5.350 connected funds and 20.727 unconnected funds take a stake in the target firm in deals with connected fund holdings, while 9.604 unconnected funds hold the target in deals without connected fund holdings.

Comparing deal characteristics (Table 3), We see that deals with connected hedge fund holdings reveal statistically significant differences in terms of hedge fund holdings, target and acquirer characteristics in comparison to deals without connected fund holdings. The average holdings of connected funds are 1.9%, and the holdings of unconnected funds and holdings in the acquirer are also higher for deals with connected fund holdings (11.3% and 10.0 % versus 10.7% and 8.5%). On average, deals with connected hedge fund holdings have a target with higher ROA (-0.004 versus -0.019), higher leverage (0.401 versus 0.355), less tangible assets (0.802 versus 0.892), an acquirer with a larger size (6.715 versus 5.824), a lower book-to-market ratio (0.317 versus 0.403), a larger ratio of deal value to acquirer market capitalization (0.471 versus 0.267), a higher percentage of cash payment (0.567 versus 0.487), are more likely to be hostile and mergers of equal deals (0.024 and 0.050 versus 0.009 and 0.024), a larger deal value (6.289 versus 0.865 billion dollars), higher termination fees (0.112 versus 0.014 billion dollars), and a lower level of target information asymmetry (1.297 versus 2.616).

[Table 2 to 3 in here]

4 Empirical Results

We report the estimation results for Equation (1), capturing the acquirer’s choice of advisors in Table 4. The coefficient of β_1 is significantly positive at the 1% level, indicating that after controlling for other factors that influence an acquirer’s choice of a financial advisor, advisor’s connection with hedge funds that have holdings in the target firm is a significant determinant of the likelihood that the acquirer chooses a specific advisor. This finding supports our ‘indirect toehold’ hypothesis that the information flows from connected hedge funds to advisors and acquirers; therefore, acquirers are more likely to choose advisors whose connected hedge funds have holdings in the target. The coefficient on *Holding* is not significant, suggesting that only the existence of information flows matters but not levels of holdings. We do not find evidence for a stronger effect for targets with higher information asymmetry as the coefficients β_3 and β_4 on the interaction term *Connected · IA* and *Holding · IA* are insignificant. The coefficients of other variables are consistent with the literature. Acquirers are more likely to select advisors with higher values of acquisitions in the prior year, higher expertise in the target’s industry, and previous connections with the acquirer.

[Table 4 in here]

Table 5 reports the estimation results for Equation (2), capturing the changes in hedge fund holdings before the deal announcement. Columns (1) to (3) present the results of changes of hedge fund holdings in targets, and columns (4) to (6) document those in acquirers. The coefficients of β are insignificant in columns (1) and (4), indicating that connected funds show no changes in their holdings in the target or acquirer firm compared to unconnected funds one quarter before the acquisition announcement. This finding suggests that either there is no information flow between the advisor and connected hedge

funds or connected funds are not willing to increase their holdings under our ‘indirect toehold’ hypothesis. The coefficients on $\Delta Holding_connected_{t-2}$ are also insignificant, indicating no changes in holdings two quarters before the acquisition announcement. After separating into sub-samples based on target information asymmetry, the β coefficients are still insignificant except in column (6). Regarding other control variables, hedge funds decrease their holdings in acquirers for tender offers. Overall, we find no evidence that connected hedge funds change their holdings in the target or acquirer firms before the acquisition announcements, hence, no support for ‘information advantage’ hypothesis.

[Table 5 in here]

Table 6-9 displays the estimation results for Equations (3) and (5) capturing the impact of connected hedge funds holdings on deal duration, completion, target premium, and abnormal returns. In Table 6 and 7, column (1) uses the whole sample and columns (2) and (3) use the sub-sample of deals with target information asymmetry level above and below the median, respectively. As for deal duration, we do not find any evidence of the effect of connected hedge funds. The coefficients of β on connected funds holdings are insignificant in all columns suggesting that connected funds holdings have no significant impact on deal duration. However, connected fund holdings significantly increase the likelihood of deal completion, especially for targets with higher information asymmetry, as revealed by a positive and significant β in column (2). Consistent with the literature, higher deal value, higher termination fees, and hostile deals are associated with higher deal duration. In contrast, the percentage of cash payment, different industries, and a tender offer reduce the deal duration. Hostile deals also decreases the probability of deal completion, while a tender offer increases the probability.

The empirical results support our ‘indirect toehold’ hypothesis regarding premium.

In Table 8, the β coefficient is negative but insignificant in column (1). Looking separately into sub-samples of deals with different levels of information asymmetry, the β coefficients are significantly negative of -2.818 and -2.213 in columns (2) and (5), respectively, for targets with higher information asymmetry. A one standard deviation increase in connected fund holdings leads to a reduction of 6.8 (5.3) bp in premium paid one week (four weeks) before the announcement for targets with a higher level of information asymmetry. On the contrary, the β coefficients are insignificant in columns (3) and (6). These results support our ‘indirect toehold’ hypothesis that connected funds holdings help the bidder reduce the premium paid to the target, especially those with higher information asymmetry levels. The influence of other control variables on premiums is consistent with the findings documented in previous literature. Premium decreases with target’s tangible assets, holdings of mutual funds, and merger of equals while increases with acquirer size, the percentage of cash payment, and tender offer.

Results in Table 9 also support our ‘indirect toehold’ hypothesis. Columns (1)-(3) and (4)-(6) reports the results for TCAR and ACAR, respectively. The coefficient β on connected fund holdings is negative but insignificant in column (1). After dividing into the two sub-samples, the β coefficient is significantly negative with value -3.475 in column (2) for targets with high asymmetry and insignificant in columns (3) for targets with low asymmetry, respectively. A one standard deviation increase in connected fund holdings leads to a reduction of 8.3 bp in target abnormal returns for targets with a higher level of information asymmetry, which is consistent with our ‘indirect toehold’ hypothesis. We find no significant impact of connected fund holdings on acquirer abnormal returns (see columns (4) to (6)). In terms of control variables, target abnormal returns are positively associated with the acquirer size, tender offer and negatively associated with the mutual fund holdings and difference industries. Acquirer abnormal returns increase with acquirer size and decrease with difference industries.

Overall, our results are consistent with the ‘indirect toehold’ hypothesis that advisors use connected hedge funds’ holdings in the target firm to obtain additional information about the target and help the bidder. Thus, acquirers are more likely to choose advisors with connected hedge fund holdings, which leads to a higher likelihood of deal completion, lower takeover premium, and target announcement returns.

[Tables 6 to 9 in here]

4.1 Shares in hedge fund portfolio

This section examines why connected funds sacrifice a higher premium and higher target abnormal return on their stake to help the bidder, which may harm their interests. One possible explanation is that connected hedge funds trade in premium and return for extra possibly informal benefits they can get from their prime brokers (see, for example, the potential information flow from prime broker to hedge funds documented in [Chung and Kang, 2016](#); [Kumar et al., 2020](#); [Qian and Zhong, 2018](#)). They will do so only when benefits outweigh costs and do not lose too much due to the lower premium paid for targets. Therefore, we replace $Holding_connected_{t-1}$ in Equation (3) with two sub-factors $Holding_connected_highshare_{t-1}$ and $Holding_connected_lowshare_{t-1}$ representing share of the target in hedge fund total portfolio is above or below the median. We expect connected funds to be more willing to sacrifice premiums in targets to gain benefit from their prime brokers when their stake in target banks accounts for a small share in their whole portfolio.

Tables 10 to 13 report the results. Table 10 show that $Holding_connected_highshare_{t-1}$ and $Holding_connected_lowshare_{t-1}$ do not have significant effects on deal duration. However, if the holdings of the target account for a larger share in hedge fund portfolio,

they lead to a significantly higher likelihood of deal completion, indicating that hedge funds are more likely to be willing for the deal to complete. The β coefficients on $Holding_connected_highshare_{t-1}$ are positive and significant in all columns in Table 11 while that on $Holding_connected_lowshare_{t-1}$ is only significant for targets with a higher information asymmetry. Tables 12 and 13 display the estimation results for Equation (2) capturing the impact of hedge fund holdings on target premiums and returns. In Table 13, the β coefficients of 8.202 on $Holding_connected_lowshare_{t-1}$ is significant at 1% for targets with higher information asymmetry while the β coefficients on $Holding_connected_highshare_{t-1}$ is three times smaller in absolute value (2.352) and statistically less significant. This finding suggests that when hedge funds hold a large fraction of the target company, they do not want to lose the returns on the announcement date, so they are less likely to supply information that may harm them. On the contrary, the effect of connected holdings on TCAR is much stronger for hedge funds for when their holdings in target banks account for a small share in their total portfolio.

[Tables 10 to 13 in here]

4.2 Hedge funds' holding period

This section examines how hedge funds' holding period affects the results. Hedge funds that held the target for a long period may be long-term investors and are less likely to share the information with prime brokers, leading to the underpayment in the M&A deal. On the contrary, hedge funds that held the target for a short term may not have a vested interest in the company, and the benefits with strong prime brokerage relations may outweigh the costs of a lower payment. Therefore, we replace $Holding_connected_{t-1}$ in Equation (3) with two sub-factors $Holding_connected_longperiod_{t-1}$ and $Holding_connected_shortperiod_{t-1}$.

representing hedge funds' holding period in the target is above or below the median. We expect connected funds to be more willing to sacrifice premiums in targets to benefit from their prime brokers when they hold the target firm for a short period.

Tables 14 to 17 report the results. Table 14 show that $Holding_connected_longperiod_{t-1}$ and $Holding_connected_shortperiod_{t-1}$ do not have significant effects on deal duration. When hedge funds hold the targets for a long period, their holdings increase the likelihood of deal completion for targets with higher information asymmetry (positive and significant β in column (2)). When hedge funds hold the targets for a short period, their holdings increase the likelihood of deal completion for targets with lower information asymmetry (positive and significant β in column (3)). Tables 16 and 17 show the estimation results for Equation (2) capturing the impact of hedge fund holdings on target premiums and returns. When hedge funds hold the target for a short period, their holdings lead to significantly lower premium ($\beta=-3.204$), lower target abnormal returns ($\beta=-3.112$), and higher acquirer abnormal returns ($\beta=1.461$) for target with higher information asymmetry while the β coefficients on $Holding_connected_longperiod_{t-1}$ are insignificant in all columns. This finding suggests that when hedge funds hold the targets for a short period, they are more likely to give up their return on the stake and share the information with prime brokers to help the bidder.

[Tables 14 to 17 in here]

5 Robustness tests

5.1 Different event windows

This section estimates the target and acquirer abnormal returns using alternative event window periods. We compute the target and acquirer abnormal returns in three different event windows, including a 3-day $[-1, +1]$ window, a 7-day $[3, +3]$ window, and an 11-day $[5, +5]$ window. Several studies address the issue of appropriate window lengths to accurately measure price reactions (Hillmer and Yu, 1979; Krivin et al., 2003). Tables 18 to 20 reports the results using the abnormal returns in different windows, and the interpretation of the results remains qualitatively unchanged.

[Tables 18 to 20 in here]

5.2 Propensity score matching

To control for other possible (unobserved) differences between deals with connected fund holdings and without, this section employs propensity score matching techniques. We examine completion, duration, premium, and abnormal returns for deals with connected fund holdings compared with a matched control sample of deals without.

The first-stage probit regression relates the probability of having connected fund holdings to a set of explanatory variables. These include the book-to-market value of target and acquirer, acquirer size, the ratio of target's asset size to the acquirer's asset size, the ratio of deal value to acquirer market capitalization, mutual fund holdings, percentage of cash, and whether target and acquirer come from different industries. 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 difference in the score is smaller than 0.01, resulting in a total of 59 matched pairs. Table 21 reveals that the resulting treated and control groups are indistinguishable in terms of all the characteristics used as the basis of matching.

Finally, in Table 22 we compare the differences across the two groups of deals in terms of their likelihood of completion, duration, premium paid in one week (four weeks) before the announcement, target, and acquirer abnormal returns over an event window of $[0]$, $[-1,1]$, $[-3,3]$, and $[-5,5]$. The results indicate that deals with connected fund holdings have significantly lower premiums and target abnormal returns in all windows. The corresponding differences are -0.111 and -0.134 for premiums and -0.181, -0.169, -0.163, and -0.167 for target abnormal returns, significant at the 5% and 1% level, respectively. There is no evidence of any difference in completion, duration, and acquirer abnormal returns between these two deals groups.

Overall, the matching results support our central conclusion: advisors use connected hedge funds' holdings in the target firm to help the bidder, leading to lower takeover premium and target announcement returns.

[Tables 21 and 22 in here]

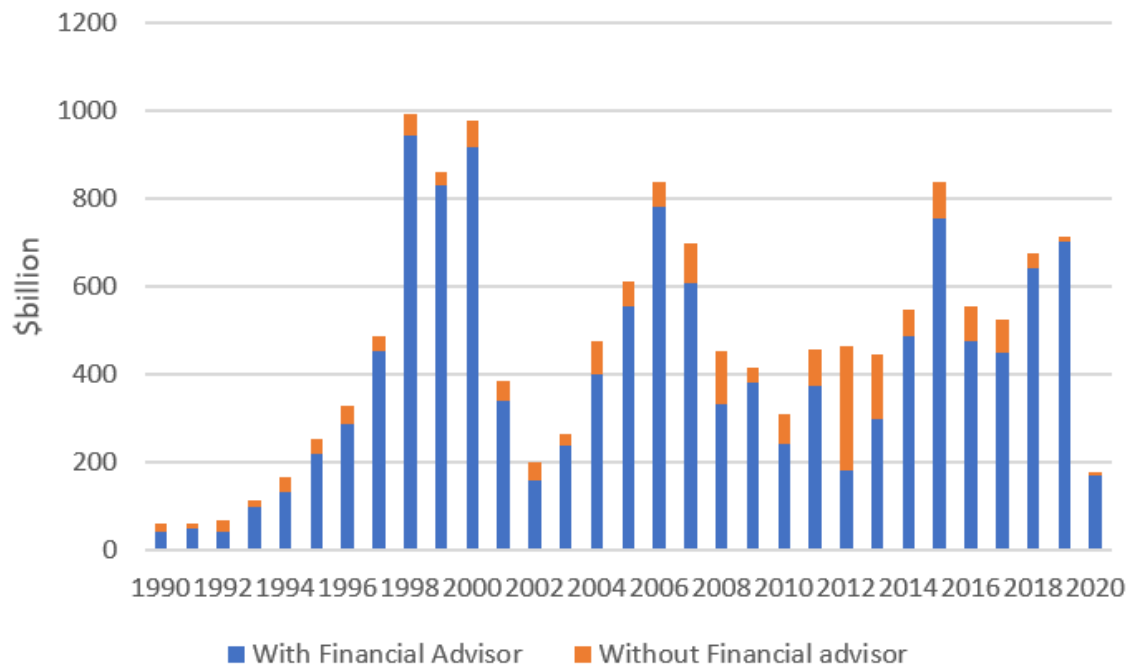
6 Conclusion

In this paper, we study the impact of advisor's hedge fund connection on the choice of advisor and deal outcome in M&A. Using a sample of 1,199 US public M&A transactions between 2000 to 2019, we find that connected hedge fund holdings in the target, measured as the holdings of hedge funds whose prime broker is the bidder's advisor, are positive

and significant determinants of the likelihood that an acquirer will choose an advisor. We further find that these connected holdings are significantly positively related to the likelihood of deal completion and negatively related to the target premium and target abnormal returns when targets have a higher level of information asymmetry.

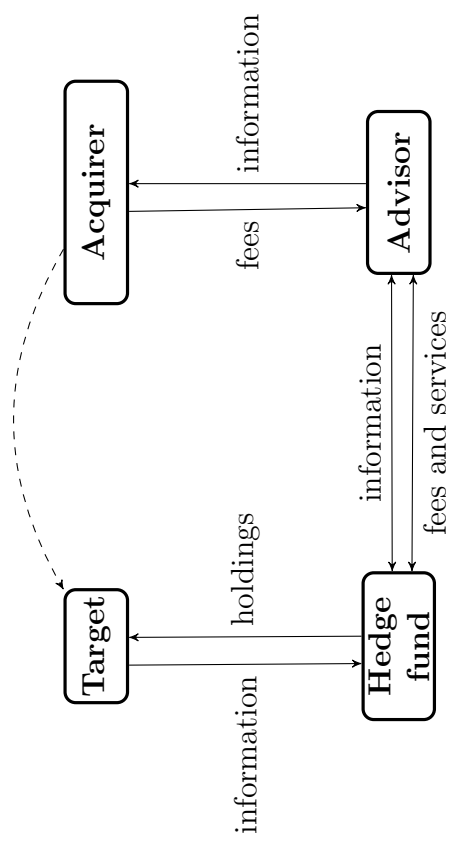
Our findings are consistent with our ‘indirect toehold’ hypothesis. Acquirers choose advisors who have connected fund holdings in the target to obtain possibly private information, reduce information asymmetry, and gain more bargaining power. Advisors also have the incentives to help the bidder. They justify their advisory fees and are more likely to be hired next time. Therefore, advisors may use connected fund holdings as an ‘indirect toehold’ in target firms, exploit information obtained from affiliated funds with holdings in the target firm, and help bidders gain more bargaining power, leading to a higher probability of acquisition completion, lower target premiums and target abnormal returns after the acquisition announcements. Our findings contribute 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 it is achieved-utilising ‘indirect toehold’ through connected hedge funds.

Our analysis provides new insights into the effects of investment banks’ connections on financial advisors’ choice and adds to the overall understanding of advisors’ roles in M&A.



The figure depicts US M&A transactions from 1990 to 2020 and the use of financial advisors (Source of data: Refinitiv Eikon).

Figure 1: US M&A from 1990 to 2020



The figure depicts the direction of information flow between advisors and hedge funds in M&A.

Figure 2: The information flow in M&A.

Tables

Table 1: Variable Description

This table describes the variables used in this paper in alphabetical order.

Variables	Description
ACAR	Acquirer cumulative abnormal returns computed on the acquisition announcement date.
Acquisition times	The number of times an advisor served as an acquirer's advisor one year before the acquisition announcements.
Acquisition value	The logarithm of the total value of all acquisitions that an advisor served as an acquirer's advisor one year before the acquisition announcements.
Age	The number of years between the firm's IPO year and the year prior to the acquisition announcement.
B/M	The book-to-market value of equity of a target or acquirer measured at the end of last fiscal year before announcement.
Completion	A dummy variable that equals one if the deal is completed.
Connected	A dummy variable equals 1 if an advisor is the prime broker of a hedge fund that have holdings in the target firm and 0 otherwise.
COV	The number of analysts for the target in the year before the bid.
Deal value	Total value of the consideration paid by the acquirer in a million dollars.
Diffind	A dummy variable equals 1 for a deal where bidder and target are from different 3-digit SIC code industries and 0 otherwise.
Duration	The number of months between the deal announcement and the deal final outcome.
ERR	The analyst error for the target in the year before the bid.
Expertise	A dummy variable equals 1 if the advisor served as an acquirer's advisor in an acquisition that involved a target from the same two-digit SIC industry as the target of the current acquisition and 0 otherwise.
Holding	Holdings of an advisor's connected hedge funds in the target firm.
Holding_acquirer _{t-1}	Hedge funds' holding the in acquirer one quarter before the acquisition announcement.
Holding_connected _{t-1}	Holdings of connected hedge funds in a target firm one quarter before the acquisition announcement.
Holding_total _{t-1}	Holdings of all hedge funds in a target firm one quarter before the acquisition announcement.
Holding_MF	Mutual fund holdings in a target firm one quarter before the acquisition announcement.
$\Delta Holding_connected$	Changes in holdings of connected funds measured by the difference between the holdings per fund in the current and previous quarters.
$\Delta Holding_unconnected$	Changes in holdings of unconnected funds are measured by the difference between the holdings per fund in the current and previous quarters.
IA	The target firm's information asymmetry measure based on five variables (<i>Amihud</i> , <i>Size</i> , <i>Age</i> , <i>COV</i> , <i>ERR</i>).
IMR	The Inverse Mills Ratio.
Leverage	The equity-to-assets ratio of a target firm at the end of last fiscal year before announcement.
Hostile	A dummy variable equals 1 for a hostile deal and 0 otherwise.
Merger of equals	A dummy variable equals 1 when the target and acquirer are considering their merger a merger of equals and 0 otherwise.
Pctcash	The percentage of the stock payment in the consideration.
Premium	The premium paid one day (week) before the acquisition announcement.
Prior advisor	A dummy variable equals 1 if the advisor served as a M&A advisor for the acquirer one year before the acquisition announcements 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 announcement.
ROA	The return on asset of the target at the end of last fiscal year before announcement.
Size	The logarithm of the target market capitalization or acquirer at the last fiscal year before announcement.
Tangible	The ratio of total tangible assets to total assets at the end of last fiscal year before announcement.
TCAR	Target cumulative abnormal returns computed on the acquisition announcement date.
Tender	A dummy variable taking the value of 1 for tender offers and 0 otherwise.
Termination fee	The amount of the termination fee paid by the acquirer in a million dollars.
Valpet	The ratio of deal value to acquirer market capitalization at the end of last fiscal year before announcement.

Table 2: Descriptive statistics of advisors

This table reports the descriptive statistics of advisor characteristics. Connected advisors are advisors with a prime brokerage connection with hedge funds that have holdings in the target firm. Panel A reports the statistics for connected and unconnected advisors, respectively. In Panel B, we include the chosen advisors and other potential advisors not chosen but active in the advisory market for each deal. Panel C reports the advisor statistics for deals with and without connected fund holdings, respectively. Other variables are summarized in Table 1. We conduct a t-test for differences in means between connected and unconnected advisors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Mean	Median	SD	Min.	Max.	N	Mean	Median	SD	Min.	Max.	N	t-test
	Panel A: Connected advisors						Unconnected advisors						
Number of deals advised	57.538	53.000	39.240	3.000	130.000	13	4.807	2.000	8.489	1.000	64.000	155	13.682***
Deal value advised (\$B)	519.880	441.470	384.260	58.061	1176.900	13	20.698	1.611	56.906	0.011	420.580	155	14.782***
	Panel B: Connected advisors						Unconnected advisors						
Probability to be chosen	0.975	1.000	0.156	0.000	1.000	767	0.013	0.000	0.113	0.000	1.000	57994	233.752***
Acquisition times	12.469	12.000	5.526	0.000	29.000	767	3.483	1.000	4.485	0.000	29.000	57994	54.942***
Acquisition value (\$B)	99.634	84.874	89.132	0.000	445.000	767	23.862	2.131	52.083	0.000	445.000	57994	39.534***
Prior advisor	0.056	0.000	0.230	0.000	1.000	767	0.003	0.000	0.057	0.000	1.000	57994	23.449***
Expertise	0.322	0.000	0.468	0.000	1.000	767	0.129	0.000	0.336	0.000	1.000	57994	15.709***
	Panel C: Deals with connected fund holdings						Deals without connected fund holdings						
Number of advisors	1.844	1.000	1.301	1.000	11.000	543	0.788	1.000	0.634	0.000	4.000	656	18.311***
Number of connected HFs	5.350	4.000	5.447	1.000	38.000	543	0.000	0.000	0.000	0.000	0.000	656	25.158***
Number of unconnected HFs	20.727	18.000	13.795	0.000	91.000	543	9.604	7.000	9.352	1.000	70.000	656	16.561***

Table 3: Descriptive statistics of deal characteristics

This table reports the descriptive statistics of deal characteristics based on whether they have connected hedge fund holdings in the target firm. We define a fund as a connected fund if the advisory bank is the prime broker of a hedge fund. $Holding_connected_{t-1}$ ($Holding_unconnected_{t-1}$) represents the holdings of connected (unconnected) hedge funds in a target firm one quarter prior the acquisition announcement. $Duration$ is the number of days between the deal announcement and the final deal outcome. $Completion$ is a dummy variable that equals one if the deal is completed. $Premium$ is the premium paid one week (four weeks) before the acquisition announcement. $TCAR$ and $ACAR$ are the cumulative abnormal returns on target and acquirer over an event window of $[0, [-1,1], [-3,3],$ and $[-5,5]$, respectively. Other variables are summarized in Table 1. 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						t-test
	Mean	Median	SD	Min.	Max.	N	Mean	Median	SD	Min.	Max.	N	
$ Holding_connected_{t-1}$	0.019	0.012	0.024	0.000	0.189	543	0.000	0.000	0.000	0.000	0.000	656	20.665***
$ Holdings_unconnected_{t-1}$	0.113	0.093	0.081	0.000	0.503	543	0.107	0.084	0.091	0.000	0.621	656	1.220
$ Holdings_acquirer_{t-1}$	0.100	0.080	0.093	0.000	0.672	543	0.085	0.067	0.087	0.000	0.581	656	2.764***
$ Duration$	4.791	4.100	2.695	1.400	10.300	543	4.497	4.100	2.356	1.400	10.300	656	1.894*
$ Completion$	0.875	1.000	0.331	0.000	1.000	543	0.895	1.000	0.307	0.000	1.000	656	-1.086
$ Premium$ (one week)	0.333	0.292	0.249	-0.021	1.027	543	0.340	0.286	0.272	-0.021	1.000	656	-0.428
$ Premium$ (four weeks)	0.355	0.298	0.269	-0.048	1.141	543	0.373	0.299	0.304	-0.048	1.141	656	-1.092
$ TCAR$	0.173	0.107	0.230	-0.200	1.748	543	0.181	0.092	0.284	-0.404	2.718	656	-0.502
$ TCAR1$	0.223	0.176	0.248	-0.210	2.308	543	0.252	0.189	0.305	-0.432	3.074	656	-1.793*
$ TCAR3$	0.234	0.192	0.250	-0.255	2.300	543	0.263	0.196	0.314	-0.510	2.908	656	-1.737*
$ TCAR5$	0.239	0.198	0.254	-0.338	2.245	543	0.269	0.204	0.321	-0.484	3.042	656	-1.777
$ ACAR$	-0.013	-0.007	0.067	-0.325	0.315	543	-0.005	-0.004	0.052	-0.271	0.539	656	-2.142**
$ ACAR1$	-0.012	-0.011	0.079	-0.333	0.354	543	-0.012	-0.008	0.068	-0.342	0.562	656	-0.205
$ ACAR3$	-0.014	-0.011	0.085	-0.324	0.367	543	-0.011	-0.010	0.071	-0.383	0.528	656	-0.559
$ ACAR5$	-0.016	-0.013	0.091	-0.355	0.342	543	-0.012	-0.011	0.082	-0.460	0.576	656	-0.764
$ ROA_t$	-0.004	0.006	0.062	-0.788	0.089	543	-0.019	0.002	0.073	-0.788	0.089	656	3.732***
$ Leverage_t$	0.401	0.386	0.296	-1.483	0.98743	543	0.355	0.299	0.330	-1.483	0.999	656	2.515**
$ B/M_t$	0.566	0.429	2.085	-10.145	44.215	543	0.672	0.624	0.516	-3.829	3.488	656	-1.261
$ Tangible_t$	0.802	0.882	0.215	0.000	1.000	543	0.892	0.977	0.172	0.000	1.000	656	-8.022***
$ Size_a$	6.715	7.998	4.098	0.000	12.740	543	5.824	6.624	3.748	0.000	12.483	656	3.933***
$ B/M_a$	0.317	0.280	0.323	-0.610	1.707	543	0.403	0.357	0.364	-0.236	2.010	656	-4.296***
$ RELSIZE$	0.565	0.124	2.723	0.000	37.120	543	0.330	0.085	1.581	0.000	37.120	656	1.870
$ Valpet$	0.471	0.206	1.231	0.000	15.294	543	0.267	0.088	0.744	0.000	15.294	656	3.533***
$ Holding_MF$	0.630	0.355	4.034	0.000	93.337	543	0.514	0.068	5.145	0.000	93.337	656	0.428
$ Pctcash$	0.567	0.622	0.412	0.000	1.000	543	0.487	0.400	0.442	0.000	1.000	656	3.214***
$ Hostile$	0.024	0.000	0.153	0.000	1.000	543	0.009	0.000	0.095	0.000	1.000	656	2.044**
$ Diffind$	0.538	1.000	0.499	0.000	1.000	543	0.530	1.000	0.499	0.000	1.000	656	0.251
$ Merger$ of equals	0.050	0.000	0.218	0.000	1.000	543	0.024	0.000	0.154	0.000	1.000	656	2.352**
$ Tender$	0.166	0.000	0.372	0.000	1.000	543	0.137	0.000	0.344	0.000	1.000	656	1.378
$ Deal$ value (\$B)	6.289	1.928	12.970	0.000	86.831	543	0.865	0.240	2.725	0.000	35.274	656	10.446***
$ Termination$ fee (\$B)	0.112	0.000	0.363	0.000	3.500	543	0.014	0.000	0.147	0.000	3.500	656	6.297***
$ IA$	1.297	1.000	1.253	0.000	5.000	543	2.616	3.000	1.215	0.000	5.000	656	-18.450***

Table 4: Logistic regression on advisor choice

This table reports the results from Equation (1), examining the acquirer’s choice of advisors in M&A. The dependent variable is a dummy variable equals one if an advisor is hired by the acquirer for the operation and zero otherwise. *Connected* is a dummy variable that equals one if an advisor is the prime broker of a hedge fund that have holdings in the target firm and zero otherwise. *Holding* is the percentage holdings of an advisor’s connected hedge funds in the target firm. *IA* represents the target firm’s information asymmetry measure based on five variables (*Amihud*, *Size*, *Age*, *COV*, *ERR*). Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)
Connected (β_1)	4.133*** (0.134)
Holding (β_2)	4.601 (6.688)
Connected·IA (β_3)	-0.101 (0.427)
Holding·IA (β_4)	25.947 (37.025)
Acquisition times	-0.001 (0.004)
Acquisition value	0.042*** (0.009)
Prior advisor	1.219*** (0.107)
Expertise	0.538*** (0.039)
IMR	-0.140** (0.070)
Constant	8.250 (5.598)
R-squared	0.531
Number of deals	1181

Table 5: Changes in hedge fund holdings before the deal announcement

This table reports the results from Equation (2) examining changes in hedge fund holdings in target and acquirer firms one quarter before the deal announcement. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. $\Delta Holding_connected$ ($\Delta Holding_unconnected$) represents the change in connected (unconnected) fund holdings. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta Holding_connected_{t-1}$ in target			$\Delta Holding_connected_{t-1}$ in acquirer		
	All	IA_high	IA_low	All	IA_high	IA_low
$\Delta Holding_unconnected_{t-1}(\beta)$	-0.001 (0.006)	-0.006 (0.004)	0.002 (0.021)	0.009 (0.010)	-0.004 (0.009)	0.052*** (0.019)
$\Delta Holding_connected_{t-2}$	0.007 (0.011)	0.020*** (0.006)	-0.073** (0.035)	0.002 (0.004)	0.001 (0.003)	-0.025 (0.026)
$\Delta Holding_unconnected_{t-2}$	-0.001 (0.005)	-0.003 (0.003)	-0.009 (0.011)	0.008 (0.005)	0.002 (0.008)	-0.004 (0.010)
Holding_acquirer _{t-1}	-0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
ROA_t	0.004 (0.045)	0.108 (0.084)	-0.149 (0.144)	0.015 (0.032)	0.040 (0.028)	-0.037 (0.063)
Leverage_t	0.000 (0.020)	-0.060 (0.045)	0.015 (0.028)	0.002 (0.007)	-0.011 (0.017)	0.007 (0.013)
B/M_t	-0.014 (0.010)	-0.010 (0.013)	-0.018 (0.014)	-0.003* (0.002)	-0.004 (0.005)	-0.003 (0.002)
Size_a	0.000 (0.004)	-0.004 (0.003)	-0.003 (0.006)	0.001 (0.001)	-0.001 (0.002)	0.002 (0.002)
B/M_a	0.005 (0.016)	-0.030* (0.016)	0.015 (0.025)	0.002 (0.006)	0.000 (0.009)	-0.002 (0.012)
Tangible_t	0.010 (0.032)	0.041 (0.072)	0.020 (0.045)	-0.023* (0.014)	-0.043 (0.032)	-0.009 (0.018)
RELSIZE	-0.001 (0.004)	-0.006 (0.007)	0.006* (0.003)	0.001 (0.001)	-0.001 (0.003)	0.002 (0.002)
Valpct	0.005 (0.010)	0.001 (0.014)	-0.005 (0.009)	-0.001 (0.003)	-0.002 (0.004)	-0.001 (0.004)
Holding_MF	0.001* (0.000)	-0.000 (0.000)	0.001 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Pctcash	0.013 (0.012)	-0.020 (0.027)	0.049** (0.020)	-0.001 (0.004)	0.002 (0.006)	0.001 (0.007)
Hostile	0.011 (0.026)	0.101 (0.084)	0.018 (0.031)	-0.023 (0.016)	-0.000 (0.013)	-0.016 (0.018)
Diffind	0.013 (0.010)	0.014 (0.017)	0.013 (0.010)	0.002 (0.004)	-0.003 (0.004)	0.006 (0.006)
Merger of equals	-0.012 (0.036)	0.012 (0.015)	-0.012 (0.047)	-0.027 (0.018)	0.002 (0.006)	-0.027 (0.020)
Tender	0.021* (0.012)	0.005 (0.023)	0.025 (0.018)	-0.008** (0.003)	-0.014** (0.006)	-0.005 (0.005)
IMR	0.026 (0.040)	0.004 (0.053)	0.022 (0.055)	0.029** (0.014)	0.050 (0.045)	0.022 (0.018)
Year	0.001 (0.001)	0.003** (0.001)	0.000 (0.001)	-0.000 (0.000)	0.000 (0.001)	-0.000 (0.001)
Constant	-3.950 (3.985)	-5.353 (3.957)	-2.004 (5.453)	-2.135 (1.346)	-4.084 (3.751)	-1.298 (2.009)
R-squared	0.357	0.516	0.475	0.357	0.505	0.492
Number of deals	910	391	519	910	391	519
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 6: Hedge fund holdings and deal duration

This table reports the results from Equation (3) examining the impact of connected fund holdings on deal duration. Column (1) uses the whole sample, and columns (2) to (3) use sub-samples of targets with information asymmetry measure above or below the median separately. *Duration* is the number of months between the deal announcement and the deal outcome. *Holding_connected_{t-1}* (*Holding_total_{t-1}*) represents the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
Sample=	All	Duration IA_high	IA_low
Holding_connected _{t-1} (β)	0.521 (4.188)	4.263 (11.363)	-1.761 (5.340)
Holding_total _{t-1}	-0.065 (0.914)	-0.031 (1.166)	-0.761 (1.615)
Holding_acquirer _{t-1}	0.057 (0.952)	-1.941* (1.060)	2.606 (1.783)
Deal value	0.026*** (0.010)	-0.114 (0.281)	0.027** (0.013)
Termination fee	1.206** (0.490)	4.625 (9.125)	1.156** (0.546)
RELSIZE	0.012 (0.039)	0.069* (0.037)	-0.064 (0.043)
Petcash	-0.006** (0.003)	-0.011** (0.006)	-0.001 (0.004)
Hostile	6.500*** (1.041)	-	9.135*** (1.379)
Diffind	-0.425** (0.174)	-0.487*** (0.180)	-0.491 (0.326)
Merger of equals	-0.121 (0.753)	-0.329 (0.517)	-0.282 (0.837)
Tender	-1.338*** (0.226)	-0.871** (0.385)	-1.662*** (0.374)
IMR	-1.979*** (0.622)	-1.751 (1.255)	-2.358** (1.007)
Year	0.011 (0.023)	-0.056* (0.033)	0.050 (0.035)
Constant	142.163* (84.160)	256.938* (149.059)	93.171 (125.778)
R-squared	0.637	0.702	0.703
Number of deals	814	355	459
Industry FE	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes

Table 7: Hedge fund holdings and deal completion

This table reports the results from Equation (5), examining the impact of connected fund holdings on deal completion. Column (1) uses the whole sample, and columns (2) to (3) use sub-samples of targets with information asymmetry measure above or below the median separately. *Completion* is a dummy variable that equals one if the deal is completed. *Holding_connected_{t-1}* (*Holding_total_{t-1}*) represents the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)
	All	Completion IA_high	IA_low
Holding_connected _{t-1} (β)	7.899** (3.666)	102.990** (40.828)	4.608 (4.228)
Holding_total _{t-1}	0.086 (0.811)	1.187 (1.089)	-0.201 (0.992)
Holding_acquirer _{t-1}	-1.513*** (0.521)	0.502 (1.076)	-2.864*** (0.652)
Deal value	-0.004 (0.008)	0.197 (0.237)	-0.008 (0.009)
Termination fee	-0.210 (0.247)	65.671* (36.898)	-0.193 (0.250)
RELSIZE	-0.023 (0.017)	-0.010 (0.020)	-0.046* (0.028)
Pctcash	0.000 (0.002)	0.001 (0.003)	-0.001 (0.002)
Hostile	-3.019*** (0.503)	-	-2.984*** (0.554)
Diffind	-0.011 (0.125)	-0.106 (0.176)	0.077 (0.180)
Merger of equals	-0.537 (0.357)	-1.599 (1.254)	-0.417 (0.310)
Tender	0.376** (0.155)	0.225 (0.307)	0.481* (0.271)
IMR	0.116 (0.314)	1.048 (0.814)	-0.166 (0.555)
Year	0.010 (0.012)	0.010 (0.020)	0.007 (0.014)
Constant	-28.581 (40.317)	-101.707 (82.244)	1.144 (61.927)
R-squared	0.113	0.080	0.169
Number of deals	921	393	526

Table 8: Hedge fund holdings and target premium

This table reports the results from Equation (3) examining the impact of connected fund holdings on target premium. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. *Premium* is the premium paid one week (four weeks) before the announcement. *Holding_connected_{t-1}* (*Holding_total_{t-1}*) represents the holdings of connected (all) hedge funds in a target firm one quarter prior the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)	(4)	(5)	(6)
	Premium (one week)			Premium (four weeks)		
	All	IA_high	IA_low	All	IA_high	IA_low
Holding_connected _{t-1} (β)	-0.102 (0.698)	-2.818*** (0.871)	-0.229 (0.581)	0.395 (0.732)	-2.213** (1.091)	0.557 (0.834)
Holding_total _{t-1}	-0.247** (0.099)	-0.372** (0.159)	-0.213 (0.154)	-0.269** (0.121)	-0.380** (0.179)	-0.172 (0.160)
Holding_acquirer _{t-1}	-0.043 (0.120)	-0.251 (0.245)	-0.116 (0.193)	-0.102 (0.136)	-0.498* (0.266)	-0.109 (0.194)
ROA_t	-0.019 (0.228)	-0.217 (0.287)	0.184 (0.373)	-0.081 (0.306)	-0.241 (0.332)	-0.013 (0.431)
Leverage_t	-0.050 (0.067)	0.015 (0.101)	-0.109 (0.089)	-0.037 (0.056)	-0.028 (0.101)	-0.068 (0.088)
B/M_t	0.028 (0.029)	0.089* (0.050)	0.016 (0.026)	0.020 (0.036)	0.104 (0.086)	0.003 (0.019)
Size_a	0.032*** (0.010)	0.033** (0.016)	0.016 (0.011)	0.046*** (0.011)	0.062** (0.024)	0.021* (0.011)
B/M_a	-0.010 (0.043)	-0.012 (0.093)	-0.043 (0.065)	0.033 (0.049)	0.060 (0.113)	-0.024 (0.065)
Tangible_t	-0.142** (0.066)	-0.205 (0.205)	0.019 (0.105)	-0.189** (0.075)	-0.231 (0.252)	0.039 (0.102)
RELSIZE	0.003 (0.004)	0.002 (0.007)	-0.004 (0.009)	0.003 (0.005)	-0.003 (0.010)	0.001 (0.011)
Valpct	-0.015 (0.011)	-0.061 (0.060)	-0.003 (0.019)	-0.007 (0.015)	-0.015 (0.041)	-0.013 (0.025)
Holding_MF	-0.001 (0.001)	-0.004* (0.002)	0.000 (0.001)	-0.001 (0.002)	-0.006*** (0.002)	0.002* (0.001)
Pctcash	0.049 (0.031)	0.028 (0.057)	0.087** (0.038)	0.043 (0.030)	-0.009 (0.049)	0.094** (0.041)
Hostile	0.096 (0.096)	0.252 (0.200)	0.054 (0.136)	-0.044 (0.077)	-0.172 (0.150)	-0.074 (0.095)
Diffind	-0.013 (0.020)	-0.039 (0.035)	-0.006 (0.031)	-0.031 (0.022)	-0.056 (0.040)	-0.016 (0.028)
Merger of equals	-0.172*** (0.057)	-0.106 (0.231)	-0.186*** (0.064)	-0.255*** (0.056)	-0.099 (0.245)	-0.241*** (0.070)
Tender	0.082*** (0.029)	-0.001 (0.055)	0.108* (0.057)	0.133*** (0.040)	0.090 (0.092)	0.145** (0.063)
IMR	0.362*** (0.080)	0.307 (0.400)	0.075 (0.136)	0.475*** (0.105)	0.741* (0.383)	0.043 (0.154)
Year	0.002 (0.003)	0.006 (0.006)	-0.002 (0.003)	0.003 (0.004)	0.008 (0.008)	-0.001 (0.003)
Constant	-31.738*** (10.082)	-35.749 (42.092)	-2.228 (15.612)	-44.525*** (13.262)	-75.720* (41.210)	-1.965 (16.115)
R-squared	0.450	0.563	0.529	0.475	0.579	0.559
Number of deals	876	374	502	877	375	502
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: Hedge fund holdings and abnormal returns

This table reports the results from Equation (3) examining the impact of connected fund holdings on cumulative abnormal returns on target and acquirer on the acquisition announcement date. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. $Holding_connected_{t-1}$ ($Holding_total_{t-1}$) represents the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample=	All	TCAR IA_high	IA_low	All	ACAR IA_high	IA_low
Holding_connected $_{t-1}(\beta)$	-0.383 (0.478)	-3.475** (1.405)	-0.582 (0.655)	0.104 (0.213)	0.750 (0.570)	0.016 (0.157)
Holding_total $_{t-1}$	-0.111 (0.147)	-0.188 (0.217)	-0.130 (0.201)	0.014 (0.024)	-0.027 (0.029)	0.044 (0.036)
Holding_acquirer $_{t-1}$	0.030 (0.177)	-0.391 (0.421)	-0.037 (0.152)	0.000 (0.035)	0.024 (0.026)	-0.019 (0.074)
ROA.t	-0.319 (0.251)	-0.394 (0.318)	-0.773 (0.576)	0.005 (0.057)	0.046 (0.084)	0.075 (0.103)
Leverage.t	0.011 (0.052)	0.125 (0.100)	-0.059 (0.085)	0.008 (0.007)	0.012 (0.019)	-0.001 (0.010)
B/M.t	0.008 (0.014)	0.006 (0.049)	0.015 (0.019)	-0.004 (0.005)	0.002 (0.008)	-0.005 (0.005)
Size.a	0.050*** (0.016)	0.038 (0.037)	0.042** (0.017)	0.004* (0.002)	0.001 (0.003)	0.006* (0.003)
B/M.a	0.052 (0.051)	0.086 (0.097)	0.068 (0.062)	0.004 (0.010)	0.019 (0.017)	-0.002 (0.019)
Tangible.t	-0.100 (0.091)	0.034 (0.368)	-0.063 (0.096)	-0.031 (0.023)	-0.035 (0.061)	-0.012 (0.030)
RELSIZE	0.001 (0.005)	0.011 (0.007)	-0.015* (0.009)	0.002* (0.001)	0.000 (0.001)	-0.001 (0.003)
Valpct	0.001 (0.019)	-0.012 (0.076)	0.024 (0.023)	0.008 (0.006)	-0.011 (0.011)	0.007 (0.007)
Holding_MF	-0.003*** (0.001)	-0.004* (0.002)	-0.002** (0.001)	0.000 (0.000)	-0.001 (0.001)	0.000 (0.000)
Pctcash	-0.011 (0.046)	-0.100 (0.102)	0.046 (0.035)	0.010 (0.008)	-0.005 (0.013)	0.018* (0.010)
Hostile	-0.086 (0.073)	-0.216 (0.263)	-0.124 (0.095)	-0.019 (0.024)	0.016 (0.030)	-0.016 (0.030)
Diffind	-0.025 (0.021)	-0.097** (0.049)	0.027 (0.024)	-0.011** (0.005)	-0.014 (0.008)	-0.008 (0.008)
Merger of equals	-0.104 (0.085)	-0.010 (0.269)	-0.109* (0.058)	-0.009 (0.040)	0.032 (0.035)	-0.003 (0.054)
Tender	0.030 (0.027)	-0.041 (0.072)	0.121** (0.052)	0.003 (0.007)	0.004 (0.008)	0.009 (0.011)
IMR	0.460*** (0.104)	0.607 (0.457)	0.323*** (0.119)	0.070*** (0.025)	0.025 (0.061)	0.051 (0.039)
Year	0.006 (0.005)	0.013 (0.011)	0.003 (0.004)	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)
Constant	-48.871*** (15.547)	-75.779 (46.895)	-30.553* (15.996)	-4.459 (2.721)	-1.035 (6.107)	-3.022 (3.877)
R-squared	0.327	0.431	0.458	0.443	0.549	0.594
Number of deals	861	378	483	856	378	478
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 10: Hedge fund holdings and deal duration: shares in hedge fund portfolio

This table reports the results from Equation (3) examining the impact of connected fund holdings on deal duration based on the share of the target in hedge fund total portfolio. Column (1) uses the whole sample, and columns (2) to (3) use sub-samples of targets with information asymmetry measure above or below the median separately. *Duration* is the number of months between the deal announcement and the deal outcome. *Holding_connected_highshare_{t-1}* (*Holding_connected_lowshare_{t-1}*) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)
	All	Duration IA_high	IA_low
Holding_connected_highshare _{t-1} (β)	1.867 (4.456)	8.866 (13.531)	-0.381 (6.217)
Holding_connected_lowshare _{t-1} (β)	-7.873 (16.136)	-16.038 (32.974)	-10.594 (21.358)
Holding_total _{t-1}	-0.058 (0.906)	0.132 (1.169)	-0.823 (1.640)
Holding_acquirer _{t-1}	0.027 (0.975)	-2.040* (1.043)	2.661 (1.795)
Deal value	0.027** (0.011)	-0.118 (0.273)	0.029** (0.014)
Termination fee	0.985** (0.454)	5.531 (8.706)	0.922* (0.495)
RELSIZE	0.001*** (0.000)	0.055 (0.044)	-0.064 (0.043)
Pctcash	-0.006** (0.003)	-0.011** (0.005)	-0.001 (0.004)
Hostile	6.443*** (1.036)	-	9.082*** (1.368)
Diffind	-0.416** (0.183)	-0.469*** (0.157)	-0.479 (0.341)
Merger of equals	-0.105 (0.747)	-0.281 (0.507)	-0.258 (0.828)
Tender	-1.355*** (0.225)	-0.883** (0.383)	-1.682*** (0.374)
IMR	-1.956*** (0.644)	-1.764 (1.262)	-2.305** (1.080)
Year	0.014 (0.024)	-0.054* (0.031)	0.053 (0.037)
Constant	133.388 (87.866)	253.006* (143.479)	83.009 (136.775)
R-squared	0.636	0.704	0.702
Number of deals	814	355	459
Industry FE	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes

Table 11: Hedge fund holdings and deal completion: shares in hedge fund portfolio

This table reports the results from Equation (3) examining the impact of connected fund holdings on deal completion based on the share of the target in hedge fund total portfolio. Column (1) uses the whole sample, and columns (2) to (3) use sub-samples of targets with information asymmetry measure above or below the median separately. *Completion* is a dummy variable that equals one if the deal is completed. *Holding_connected_highshare_{t-1}* (*Holding_connected_lowshare_{t-1}*) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)
	All	Completion IA_high	IA_low
Holding_connected_highshare _{t-1} (β)	12.457** (4.860)	145.135* (76.470)	10.117** (5.122)
Holding_connected_lowshare _{t-1} (β)	-1.257 (7.748)	84.428* (47.415)	-10.291 (9.390)
Holding_total _{t-1}	0.042 (0.808)	1.176 (1.083)	-0.323 (0.995)
Holding_acquirer _{t-1}	-1.532*** (0.520)	0.465 (1.060)	-2.928*** (0.651)
Deal value	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Termination fee	-0.000 (0.000)	0.063* (0.036)	-0.000 (0.000)
RELSIZE	-0.000 (0.001)	0.001*** (0.000)	-0.026 (0.032)
Pctcash	0.000 (0.002)	0.001 (0.003)	-0.000 (0.002)
Hostile	-3.091*** (0.540)	-	-3.077*** (0.591)
Diffind	-0.026 (0.123)	-0.112 (0.175)	0.077 (0.181)
Merger of equals	-0.626* (0.365)	-1.583 (1.251)	-0.354 (0.350)
Tender	0.398*** (0.148)	0.235 (0.309)	0.533** (0.262)
IMR	0.201 (0.307)	1.061 (0.814)	0.022 (0.535)
Year	0.013 (0.012)	0.011 (0.020)	0.011 (0.013)
Constant	-41.497 (38.943)	-105.077 (81.816)	-22.412 (59.044)
R-squared	0.114	0.080	0.180
Number of deals	921	393	526

Table 12: Hedge fund holdings and target premium: shares in hedge fund portfolio

This table reports the results from Equation (3) examining the impact of connected fund holdings on target premium based on the share of the target in hedge fund total portfolio. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. *Premium* is the premium paid one week (four weeks) before the announcement. *Holding_connected_highshare_{t-1}* (*Holding_connected_lowshare_{t-1}*) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)	(4)	(5)	(6)
	Premium (one week)			Premium (four weeks)		
	All	IA_high	IA_low	All	IA_high	IA_low
Holding_connected_highshare _{t-1} (β)	-0.188 (0.727)	-2.859** (1.171)	-0.574 (0.576)	0.568 (0.855)	-1.977 (1.434)	0.418 (1.016)
Holding_connected_lowshare _{t-1} (β)	0.009 (1.692)	-2.684 (2.543)	1.441 (2.528)	-0.938 (1.469)	-3.208 (2.455)	0.477 (1.866)
Holding_total _{t-1}	-0.262*** (0.097)	-0.372** (0.155)	-0.213 (0.159)	-0.291** (0.117)	-0.368** (0.180)	-0.208 (0.159)
Holding_acquirer _{t-1}	-0.032 (0.118)	-0.251 (0.248)	-0.123 (0.187)	-0.093 (0.133)	-0.507* (0.269)	-0.091 (0.183)
ROA_t	0.049 (0.035)	-0.222 (0.293)	0.066 (0.043)	0.054** (0.027)	-0.239 (0.340)	0.060 (0.044)
Leverage_t	-0.061 (0.058)	0.016 (0.102)	-0.097 (0.069)	-0.060 (0.043)	-0.028 (0.101)	-0.082 (0.069)
B/M_t	0.029 (0.044)	0.088* (0.050)	-0.013 (0.039)	0.034 (0.051)	0.104 (0.086)	-0.012 (0.034)
Size_a	0.033*** (0.009)	0.034** (0.016)	0.018 (0.012)	0.043*** (0.010)	0.062** (0.024)	0.022** (0.010)
B/M_a	-0.014 (0.025)	-0.004 (0.088)	0.014 (0.023)	-0.021 (0.029)	0.064 (0.106)	0.009 (0.020)
Tangible_t	-0.176*** (0.062)	-0.210 (0.205)	-0.024 (0.102)	-0.222*** (0.073)	-0.227 (0.251)	-0.022 (0.100)
RELSIZE	0.000 (0.000)	0.002 (0.007)	0.000 (0.000)	0.000 (0.000)	-0.004 (0.010)	0.000* (0.000)
Valpct	-0.005*** (0.001)	-0.062 (0.062)	-0.006*** (0.001)	-0.005*** (0.001)	-0.020 (0.042)	-0.007*** (0.001)
Holding_MF	-0.000*** (0.000)	-0.000* (0.000)	0.000 (0.001)	-0.000*** (0.000)	-0.000*** (0.000)	0.002** (0.001)
Pctcash	0.000 (0.000)	0.000 (0.001)	0.001* (0.000)	0.000 (0.000)	-0.000 (0.000)	0.001** (0.000)
Hostile	0.097 (0.089)	0.251 (0.202)	0.038 (0.142)	-0.021 (0.065)	-0.176 (0.153)	-0.090 (0.096)
Diffind	-0.014 (0.018)	-0.039 (0.035)	-0.009 (0.030)	-0.032 (0.021)	-0.056 (0.041)	-0.019 (0.028)
Merger of equals	-0.177*** (0.060)	-0.106 (0.232)	-0.207*** (0.059)	-0.254*** (0.059)	-0.096 (0.250)	-0.264*** (0.066)
Tender	0.089*** (0.028)	-0.001 (0.054)	0.108* (0.056)	0.142*** (0.039)	0.090 (0.092)	0.153** (0.059)
IMR	0.405*** (0.085)	0.310 (0.405)	0.094 (0.121)	0.528*** (0.102)	0.739* (0.383)	0.114 (0.124)
Year	0.002 (0.003)	0.005 (0.007)	-0.002 (0.003)	0.004 (0.004)	0.008 (0.008)	-0.000 (0.003)
Constant	-35.748*** (10.464)	-35.631 (42.350)	-2.866 (14.085)	-50.592*** (13.048)	-75.314* (41.272)	-8.147 (13.453)
R-squared	0.453	0.563	0.539	0.482	0.579	0.570
Number of deals	876	374	502	877	375	502
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 13: Hedge fund holdings and abnormal returns: shares in hedge fund portfolio

This table reports the results from Equation (3) examining the impact of connected fund holdings on cumulative abnormal returns on target and acquirer on the acquisition announcement date based on the share of the target in hedge fund total portfolio. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. $Holding_connected_highshare_{t-1}$ ($Holding_connected_lowshare_{t-1}$) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)	(4)	(5)	(6)
	All	TCAR IA_high	IA_low	All	ACAR IA_high	IA_low
Holding_connected_highshare _{t-1} (β)	-0.288 (0.534)	-2.352* (1.383)	-0.487 (0.696)	0.074 (0.234)	0.969* (0.562)	-0.057 (0.164)
Holding_connected_lowshare _{t-1} (β)	-0.664 (1.838)	-8.202*** (3.106)	0.069 (3.093)	0.302 (0.259)	-0.172 (0.491)	0.577 (0.366)
Holding_total _{t-1}	-0.107 (0.150)	-0.131 (0.219)	-0.118 (0.212)	0.015 (0.024)	-0.016 (0.033)	0.050 (0.034)
Holding_acquirer _{t-1}	0.025 (0.176)	-0.429 (0.426)	0.035 (0.142)	-0.004 (0.034)	0.016 (0.026)	-0.025 (0.074)
ROA_t	-0.172 (0.130)	-0.382 (0.323)	-0.199 (0.155)	0.010 (0.027)	0.049 (0.084)	0.021 (0.020)
Leverage_t	0.006 (0.052)	0.126 (0.099)	-0.066 (0.082)	0.004 (0.006)	0.012 (0.019)	-0.006 (0.010)
B/M_t	-0.008 (0.022)	0.004 (0.047)	-0.004 (0.028)	0.001 (0.005)	0.002 (0.008)	0.005 (0.006)
Size_a	0.046*** (0.014)	0.037 (0.036)	0.044*** (0.019)	0.002 (0.002)	0.001 (0.003)	0.004 (0.003)
B/M_a	0.009 (0.014)	0.105 (0.088)	0.006 (0.017)	-0.002 (0.003)	0.023 (0.017)	-0.005 (0.004)
Tangible_t	-0.117 (0.088)	0.073 (0.370)	-0.090 (0.104)	-0.021 (0.024)	-0.027 (0.061)	0.000 (0.030)
RELSIZE	0.000*** (0.000)	0.008 (0.007)	-0.000 (0.013)	0.000*** (0.000)	-0.000 (0.001)	-0.002 (0.004)
Valpct	-0.003* (0.002)	-0.022 (0.075)	-0.003 (0.003)	0.000 (0.000)	-0.013 (0.011)	0.001 (0.001)
Holding_MF	-0.000*** (0.000)	-0.000** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Pctcash	-0.000 (0.000)	-0.001 (0.001)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000* (0.000)
Hostile	-0.061 (0.072)	-0.230 (0.261)	-0.065 (0.090)	-0.013 (0.023)	0.014 (0.030)	-0.016 (0.030)
Diffind	-0.023 (0.021)	-0.095** (0.047)	0.024 (0.023)	-0.011** (0.004)	-0.013 (0.008)	-0.010 (0.008)
Merger of equals	-0.110 (0.089)	-0.001 (0.282)	-0.097 (0.061)	-0.009 (0.040)	0.034 (0.038)	-0.003 (0.053)
Tender	0.033 (0.027)	-0.043 (0.073)	0.112** (0.050)	0.003 (0.007)	0.003 (0.007)	0.009 (0.011)
IMR	0.490*** (0.087)	0.588 (0.460)	0.413*** (0.149)	0.048** (0.023)	0.022 (0.062)	0.022 (0.036)
Year	0.007 (0.005)	0.014 (0.011)	0.003 (0.004)	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)
Constant	-51.537*** (14.097)	-75.005 (48.327)	-39.030** (18.424)	-2.772 (2.399)	-0.896 (6.070)	-0.335 (3.667)
R-squared	0.326	0.435	0.453	0.459	0.558	0.599
Number of deals	861	378	483	856	378	478
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	41 Yes	Yes	Yes	Yes	Yes

Table 14: Hedge fund holdings and deal duration: hedge fund holding period

This table reports the results from Equation (3) examining the impact of connected fund holdings on deal duration based on hedge funds' holding period in the target firm. Column (1) uses the whole sample, and columns (2) to (3) use sub-samples of targets with information asymmetry measure above or below the median separately. *Duration* is the number of months between the deal announcement and the deal outcome. *Holding_connected_highshare_{t-1}* (*Holding_connected_lowshare_{t-1}*) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
Sample=	All	Duration IA_high	IA_low
Holding_connected_longperiod _{t-1} (β)	-3.687 (5.120)	3.247 (25.147)	-4.611 (7.315)
Holding_connected_shortperiod _{t-1} (β)	7.198 (6.786)	4.968 (8.919)	3.492 (9.885)
Holding_total _{t-1}	-0.058 (0.901)	-0.020 (1.224)	-0.778 (1.597)
Holding_acquirer _{t-1}	0.044 (0.962)	-1.945* (1.050)	2.596 (1.790)
Deal value	0.028** (0.011)	-0.114 (0.283)	0.030** (0.013)
Termination fee	1.007** (0.467)	4.658 (9.320)	0.940* (0.506)
RELSIZE	0.001*** (0.000)	0.069* (0.042)	-0.062 (0.044)
Pctcash	-0.006** (0.003)	-0.011** (0.006)	-0.001 (0.004)
Hostile	6.455*** (1.033)	-	9.156*** (1.396)
Diffind	-0.419** (0.177)	-0.488*** (0.185)	-0.479 (0.325)
Merger of equals	-0.104 (0.740)	-0.325 (0.500)	-0.255 (0.830)
Tender	-1.357*** (0.230)	-0.873** (0.390)	-1.704*** (0.397)
IMR	-1.963*** (0.613)	-1.751 (1.257)	-2.327** (1.008)
Year	0.015 (0.023)	-0.056 (0.034)	0.052 (0.035)
Constant	132.519 (83.438)	256.557* (150.711)	85.519 (127.163)
R-squared	0.637	0.702	0.702
Number of deals	814	355	459
Industry FE	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes

Table 15: Hedge fund holdings and deal completion: hedge fund holding period

This table reports the results from Equation (3) examining the impact of connected fund holdings on deal completion based on hedge funds' holding period in the target firm. Column (1) uses the whole sample, and columns (2) to (3) use sub-samples of targets with information asymmetry measure above or below the median separately. *Completion* is a dummy variable that equals one if the deal is completed. *Holding_connected_highshare_{t-1}* (*Holding_connected_lowshare_{t-1}*) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1)	(2)	(3)
	All	Completion IA_high	IA_low
Holding_connected_longperiod _{t-1} (β)	3.345 (4.267)	390.916* (202.243)	-1.075 (4.720)
Holding_connected_shortperiod _{t-1} (β)	27.214** (10.585)	55.897 (34.200)	28.132** (12.698)
Holding_total _{t-1}	0.070 (0.798)	1.145 (1.081)	-0.205 (0.971)
Holding_acquirer _{t-1}	-1.554*** (0.527)	0.497 (1.075)	-3.046*** (0.670)
Deal value	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Termination fee	-0.000 (0.000)	0.063* (0.036)	-0.000 (0.000)
RELSIZE	-0.000 (0.001)	0.001*** (0.000)	-0.026 (0.032)
Pctcash	0.000 (0.002)	0.001 (0.003)	-0.000 (0.002)
Hostile	-2.990*** (0.513)	-	-2.941*** (0.572)
Diffind	-0.014 (0.124)	-0.106 (0.175)	0.106 (0.182)
Merger of equals	-0.627* (0.362)	-1.581 (1.243)	-0.303 (0.318)
Tender	0.378** (0.156)	0.225 (0.315)	0.475* (0.275)
IMR	0.238 (0.316)	1.054 (0.815)	-0.006 (0.544)
Year	0.012 (0.012)	0.010 (0.020)	0.008 (0.014)
Constant	-42.431 (40.269)	-103.168 (82.231)	-13.789 (61.019)
R-squared	0.116	0.084	0.181
Number of deals	921	393	526

Table 16: Hedge fund holdings and target premium: hedge fund holding period

This table reports the results from Equation (3) examining the impact of connected fund holdings on target premium based on hedge funds' holding period in the target firm. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. *Premium* is the premium paid one week (four weeks) before the announcement. *Holding_connected_highshare_{t-1}* (*Holding_connected_lowshare_{t-1}*) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	Premium (one week)			Premium (four weeks)		
	(1) All	(2) IA_high	(3) IA_low	(4) All	(5) IA_high	(6) IA_low
Holding_connected_longperiod _{t-1} (β)	0.133 (0.883)	-2.326 (2.238)	-0.334 (0.749)	0.599 (0.880)	-2.709 (2.140)	0.572 (1.124)
Holding_connected_shortperiod _{t-1} (β)	-0.657 (0.932)	-3.204*** (0.759)	-0.293 (0.823)	-0.065 (0.823)	-1.847 (1.160)	0.145 (0.861)
Holding_total _{t-1}	-0.261*** (0.097)	-0.375** (0.156)	-0.224 (0.156)	-0.294** (0.118)	-0.374** (0.183)	-0.206 (0.151)
Holding_acquirer _{t-1}	-0.033 (0.118)	-0.246 (0.251)	-0.119 (0.190)	-0.092 (0.133)	-0.506* (0.270)	-0.089 (0.185)
ROA_t	0.048 (0.036)	-0.226 (0.287)	0.064 (0.043)	0.054** (0.027)	-0.239 (0.338)	0.060 (0.044)
Leverage_t	-0.060 (0.059)	0.015 (0.100)	-0.094 (0.069)	-0.061 (0.044)	-0.027 (0.102)	-0.081 (0.068)
B/M_t	0.030 (0.045)	0.089* (0.049)	-0.014 (0.039)	0.035 (0.051)	0.102 (0.087)	-0.012 (0.035)
Size_a	0.033*** (0.009)	0.034** (0.016)	0.016 (0.011)	0.043*** (0.010)	0.062** (0.024)	0.022** (0.010)
B/M_a	-0.014 (0.025)	-0.003 (0.088)	0.014 (0.023)	-0.022 (0.029)	0.062 (0.106)	0.009 (0.020)
Tangible_t	-0.175*** (0.062)	-0.212 (0.208)	-0.024 (0.102)	-0.224*** (0.073)	-0.231 (0.256)	-0.021 (0.102)
RELSIZE	0.000 (0.000)	0.002 (0.007)	0.000 (0.000)	0.000 (0.000)	-0.003 (0.010)	0.000** (0.000)
Valpct	-0.005*** (0.001)	-0.063 (0.063)	-0.006*** (0.001)	-0.005*** (0.002)	-0.018 (0.042)	-0.007*** (0.001)
Holding_MF	-0.000*** (0.000)	-0.000* (0.000)	0.000 (0.001)	-0.000*** (0.000)	-0.000*** (0.000)	0.002* (0.001)
Pctcash	0.000 (0.000)	0.000 (0.001)	0.001** (0.000)	0.000 (0.000)	-0.000 (0.001)	0.001** (0.000)
Hostile	0.098 (0.089)	0.253 (0.200)	0.039 (0.140)	-0.019 (0.067)	-0.177 (0.153)	-0.089 (0.096)
Diffind	-0.015 (0.019)	-0.038 (0.037)	-0.006 (0.029)	-0.034 (0.021)	-0.057 (0.041)	-0.020 (0.027)
Merger of equals	-0.177*** (0.060)	-0.108 (0.228)	-0.208*** (0.059)	-0.254*** (0.060)	-0.095 (0.249)	-0.265*** (0.067)
Tender	0.090*** (0.028)	-0.000 (0.054)	0.108* (0.057)	0.144*** (0.039)	0.090 (0.091)	0.154*** (0.059)
IMR	0.403*** (0.083)	0.308 (0.402)	0.108 (0.125)	0.518*** (0.102)	0.744* (0.384)	0.112 (0.132)
Year	0.002 (0.003)	0.005 (0.006)	-0.002 (0.003)	0.004 (0.004)	0.008 (0.008)	-0.000 (0.003)
Constant	-35.308*** (10.265)	-35.223 (41.988)	-4.890 (14.705)	-48.934*** (12.849)	-75.790* (41.109)	-7.817 (14.573)
R-squared	0.454	0.563	0.537	0.481	0.579	0.570
Number of deals	876	374	502	877	375	502
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 17: Hedge fund holdings and abnormal returns: hedge fund holding period

This table reports the results from Equation (3) examining the impact of connected fund holdings on cumulative abnormal returns on target and acquirer on the acquisition announcement date based on hedge funds' holding period in the target firm. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. $Holding_connected_highshare_{t-1}$ ($Holding_connected_lowshare_{t-1}$) represents the holdings of connected hedge funds in a target firm that accounts for a high (low) share in hedge fund total portfolio one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1) All	(2) TCAR IA_high	(3) IA_low	(4) All	(5) ACAR IA_high	(6) IA_low
Holding_connected_longperiod _{t-1} (β)	-0.288 (0.632)	-3.947 (2.388)	-0.349 (0.769)	-0.097 (0.129)	-0.200 (0.420)	-0.052 (0.172)
Holding_connected_shortperiod _{t-1} (β)	-0.428 (0.739)	-3.112** (1.401)	-0.549 (0.664)	0.447 (0.429)	1.461*** (0.233)	0.169 (0.257)
Holding_total _{t-1}	-0.108 (0.150)	-0.177 (0.218)	-0.121 (0.210)	0.016 (0.024)	-0.015 (0.037)	0.045 (0.034)
Holding_acquirer _{t-1}	0.026 (0.176)	-0.399 (0.428)	0.035 (0.143)	-0.004 (0.034)	0.012 (0.027)	-0.027 (0.074)
ROA _t	-0.173 (0.130)	-0.394 (0.322)	-0.201 (0.153)	0.011 (0.026)	0.054 (0.085)	0.020 (0.021)
Leverage _t	0.006 (0.053)	0.127 (0.100)	-0.065 (0.083)	0.003 (0.006)	0.013 (0.019)	-0.006 (0.010)
B/M _t	-0.008 (0.022)	0.001 (0.048)	-0.004 (0.028)	0.000 (0.005)	-0.000 (0.008)	0.005 (0.006)
Size _a	0.046*** (0.014)	0.038 (0.036)	0.043** (0.019)	0.002 (0.002)	0.001 (0.003)	0.004 (0.003)
B/M _a	0.009 (0.014)	0.099 (0.089)	0.006 (0.017)	-0.002 (0.003)	0.021 (0.015)	-0.005 (0.004)
Tangible _t	-0.118 (0.088)	0.036 (0.365)	-0.090 (0.106)	-0.022 (0.024)	-0.027 (0.058)	-0.001 (0.030)
RELSIZE	0.000*** (0.000)	0.011 (0.007)	-0.000 (0.013)	0.000*** (0.000)	0.001 (0.001)	-0.002 (0.004)
Valpct	-0.003* (0.002)	-0.019 (0.076)	-0.003 (0.003)	0.000* (0.000)	-0.011 (0.010)	0.001 (0.001)
Holding_MF	-0.000*** (0.000)	-0.000** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Pctcash	-0.000 (0.000)	-0.001 (0.001)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)
Hostile	-0.060 (0.072)	-0.225 (0.261)	-0.064 (0.089)	-0.015 (0.023)	0.009 (0.031)	-0.016 (0.030)
Diffind	-0.024 (0.021)	-0.098** (0.048)	0.024 (0.025)	-0.011** (0.004)	-0.015* (0.009)	-0.008 (0.008)
Merger of equals	-0.110 (0.090)	-0.006 (0.275)	-0.100* (0.059)	-0.008 (0.040)	0.036 (0.039)	-0.004 (0.052)
Tender	0.033 (0.027)	-0.042 (0.072)	0.112** (0.050)	0.003 (0.007)	0.002 (0.006)	0.008 (0.011)
imr	0.487*** (0.087)	0.604 (0.464)	0.415*** (0.153)	0.052** (0.022)	0.027 (0.061)	0.028 (0.036)
year	0.006 (0.005)	0.013 (0.011)	0.003 (0.004)	-0.000 (0.001)	-0.000 (0.001)	-0.001 (0.001)
Constant	-51.088*** (13.874)	-75.245 (47.834)	-39.404** (19.174)	-3.398 (2.366)	-1.603 (6.145)	-1.314 (3.532)
R-squared	0.326	0.432	0.453	0.463	0.577	0.597
Number of deals	861	378	483	856	378	478
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 18: Hedge fund holdings and abnormal returns: different event windows

This table reports the results from Equation (3) examining the impact of connected fund holdings on cumulative abnormal returns on target and acquirer over an event window of [-1,1]. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. $Holding_connected_{t-1}$ ($Holding_total_{t-1}$) represents the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Sample=	(1) All	(2) TCAR IA_high	(3) IA_low	(4) All	(5) ACAR IA_high	(6) IA_low
Holding_connected $_{t-1}(\beta)$	-0.126 (0.633)	-2.928** (1.196)	-0.390 (0.534)	0.084 (0.174)	0.589 (0.463)	0.054 (0.156)
Holding_total $_{t-1}$	-0.250* (0.147)	-0.419** (0.172)	-0.179 (0.176)	0.022 (0.036)	0.005 (0.070)	0.015 (0.047)
Holding_acquirer $_{t-1}$	-0.019 (0.183)	-0.355 (0.393)	-0.158 (0.192)	0.015 (0.043)	-0.018 (0.064)	-0.030 (0.073)
ROA_t	-0.341 (0.332)	-0.205 (0.441)	-0.982* (0.571)	-0.019 (0.076)	0.019 (0.083)	-0.004 (0.153)
Leverage_t	0.004 (0.055)	0.167 (0.106)	-0.095 (0.082)	0.017 (0.016)	0.050 (0.039)	-0.000 (0.012)
B/M_t	0.000 (0.022)	-0.014 (0.073)	0.012 (0.021)	0.001 (0.006)	0.008 (0.013)	0.001 (0.005)
Size_a	0.050*** (0.016)	0.045 (0.036)	0.032*** (0.012)	0.005** (0.002)	0.001 (0.004)	0.006 (0.004)
B/M_a	-0.002 (0.034)	0.012 (0.123)	0.037 (0.047)	0.009 (0.012)	0.029 (0.024)	0.020 (0.018)
Tangible_t	-0.290*** (0.065)	-0.213 (0.315)	-0.153 (0.093)	-0.044 (0.035)	-0.027 (0.083)	-0.024 (0.035)
RELSIZE	0.007 (0.008)	0.011 (0.008)	0.002 (0.009)	0.001 (0.001)	-0.001 (0.002)	-0.003 (0.003)
Valpct	-0.009 (0.022)	-0.031 (0.086)	0.001 (0.022)	0.008 (0.005)	-0.012 (0.013)	0.010 (0.008)
Holding_MF	-0.002 (0.002)	-0.008*** (0.002)	0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)	0.000 (0.000)
Pctcash	0.044 (0.043)	-0.040 (0.096)	0.094*** (0.027)	0.020** (0.010)	0.005 (0.019)	0.023** (0.011)
Hostile	-0.034 (0.089)	0.296 (0.292)	-0.121 (0.086)	0.002 (0.020)	0.045 (0.046)	-0.005 (0.025)
Diffind	-0.031 (0.024)	-0.066 (0.052)	0.022 (0.022)	-0.019*** (0.006)	-0.025** (0.011)	-0.012 (0.009)
Merger of equals	-0.093 (0.101)	0.045 (0.304)	-0.136** (0.063)	0.011 (0.040)	0.038 (0.069)	0.028 (0.044)
Tender	0.063 (0.041)	0.044 (0.115)	0.100* (0.051)	0.003 (0.009)	0.011 (0.014)	0.009 (0.009)
IMR	0.715*** (0.116)	0.799** (0.399)	0.429*** (0.113)	0.077*** (0.023)	0.029 (0.071)	0.072** (0.034)
Year	0.005 (0.003)	0.011 (0.008)	0.002 (0.004)	-0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)
Constant	-66.507*** (14.032)	-85.685** (38.356)	-38.283*** (14.524)	-5.601** (2.430)	-2.982 (7.382)	-4.472 (3.293)
R-squared	0.379	0.451	0.471	0.418	0.511	0.566
Number of deals	907	389	518	902	389	513
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 19: Hedge fund holdings and abnormal returns: different event windows

This table reports the results from Equation (3) examining the impact of connected fund holdings on cumulative abnormal returns on target and acquirer over an event window of [-3,3]. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. $Holding_connected_{t-1}$ ($Holding_total_{t-1}$) represents the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample=	All	TCAR IA_high	IA_low	All	ACAR IA_high	IA_low
Holding_connected $_{t-1}(\beta)$	0.044 (0.596)	-2.734** (1.315)	-0.331 (0.504)	0.284 (0.255)	1.055 (0.698)	0.180 (0.162)
Holding_total $_{t-1}$	-0.223 (0.149)	-0.417** (0.189)	-0.101 (0.185)	0.022 (0.033)	0.010 (0.067)	0.015 (0.050)
Holding_acquirer $_{t-1}$	-0.040 (0.175)	-0.375 (0.382)	-0.131 (0.192)	0.028 (0.046)	0.037 (0.063)	-0.030 (0.070)
ROA_t	-0.136 (0.300)	-0.229 (0.444)	-0.045 (0.520)	0.060 (0.053)	0.030 (0.095)	0.170* (0.097)
Leverage_t	0.003 (0.050)	0.162 (0.099)	-0.094 (0.087)	0.011 (0.017)	0.024 (0.029)	-0.005 (0.013)
B/M_t	-0.006 (0.025)	-0.021 (0.075)	-0.000 (0.023)	0.001 (0.006)	0.008 (0.013)	-0.001 (0.005)
Size_a	0.049*** (0.016)	0.047 (0.035)	0.033** (0.014)	0.005* (0.003)	0.001 (0.005)	0.007 (0.005)
B/M_a	-0.001 (0.041)	-0.002 (0.127)	0.056 (0.052)	0.002 (0.013)	0.022 (0.020)	0.012 (0.019)
Tangible_t	-0.268*** (0.080)	-0.234 (0.306)	-0.103 (0.091)	-0.025 (0.033)	-0.023 (0.086)	-0.021 (0.033)
RELSIZE	0.008 (0.007)	0.013 (0.008)	0.003 (0.008)	0.000 (0.002)	-0.004** (0.002)	-0.003 (0.003)
Valpct	-0.016 (0.020)	-0.034 (0.089)	-0.010 (0.021)	0.006 (0.006)	-0.017 (0.015)	0.007 (0.008)
Holding_MF	-0.002 (0.002)	-0.008*** (0.002)	0.000 (0.001)	-0.000 (0.000)	-0.001 (0.000)	0.000 (0.000)
Pctcash	0.043 (0.041)	-0.039 (0.096)	0.088*** (0.031)	0.018* (0.009)	0.002 (0.020)	0.024** (0.012)
Hostile	-0.008 (0.087)	0.286 (0.291)	-0.061 (0.090)	0.002 (0.022)	0.077* (0.039)	-0.006 (0.029)
Diffind	-0.035 (0.023)	-0.067 (0.048)	-0.002 (0.027)	-0.019*** (0.006)	-0.021** (0.008)	-0.017** (0.009)
Merger of equals	-0.062 (0.101)	0.084 (0.325)	-0.078 (0.067)	0.011 (0.034)	0.050 (0.071)	0.030 (0.037)
Tender	0.079* (0.041)	0.074 (0.106)	0.101** (0.050)	0.004 (0.008)	0.010 (0.014)	0.009 (0.009)
IMR	0.699*** (0.119)	0.863** (0.412)	0.403*** (0.135)	0.073** (0.029)	0.011 (0.085)	0.082** (0.038)
Year	0.004 (0.003)	0.011 (0.007)	0.001 (0.003)	-0.000 (0.001)	-0.000 (0.002)	-0.000 (0.001)
Constant	-62.837*** (13.433)	-90.280** (40.665)	-34.101** (16.100)	-5.141* (2.724)	-0.447 (8.871)	-5.910 (3.572)
R-squared	0.386	0.467	0.448	0.406	0.519	0.549
Number of deals	908	389	519	903	389	514
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 20: Hedge fund holdings and abnormal returns: different event windows

This table reports the results from Equation (3) examining the impact of connected fund holdings on cumulative abnormal returns on target and acquirer over an event window of [-5,5]. Columns (1) and (4) use the whole sample, and columns (2)-(3) and (5)-(6) use sub-samples of targets with information asymmetry measure above or below the median separately. $Holding_connected_{t-1}$ ($Holding_total_{t-1}$) represents the holdings of connected (all) hedge funds in a target firm one quarter before the acquisition announcement. Other variables are defined in Table 1. Standard errors are clustered at the fund level and reported in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample=	All	TCAR IA_high	IA_low	All	ACAR IA_high	IA_low
Holding_connected $_{t-1}(\beta)$	-0.127 (0.619)	-2.985** (1.326)	-0.376 (0.543)	0.263 (0.256)	1.063 (0.843)	0.171 (0.195)
Holding_total $_{t-1}$	-0.205 (0.149)	-0.351* (0.211)	-0.099 (0.196)	0.037 (0.037)	0.020 (0.074)	0.033 (0.051)
Holding_acquirer $_{t-1}$	-0.037 (0.182)	-0.383 (0.390)	-0.136 (0.197)	0.036 (0.048)	0.058 (0.066)	-0.017 (0.073)
ROA_t	-0.172 (0.312)	-0.266 (0.446)	-0.004 (0.520)	0.042 (0.060)	0.034 (0.098)	0.177 (0.120)
Leverage_t	-0.011 (0.053)	0.148 (0.106)	-0.118 (0.087)	0.004 (0.020)	0.020 (0.040)	-0.013 (0.016)
B/M_t	-0.010 (0.026)	-0.014 (0.086)	-0.009 (0.021)	-0.002 (0.006)	0.002 (0.019)	-0.004 (0.005)
Size_a	0.048*** (0.016)	0.042 (0.037)	0.032** (0.014)	0.005 (0.004)	0.002 (0.007)	0.007 (0.006)
B/M_a	0.007 (0.042)	0.019 (0.126)	0.066 (0.057)	0.001 (0.014)	0.016 (0.027)	0.011 (0.023)
Tangible_t	-0.267*** (0.083)	-0.174 (0.322)	-0.111 (0.101)	-0.017 (0.033)	0.012 (0.078)	-0.024 (0.035)
RELSIZE	0.008 (0.007)	0.008 (0.008)	0.003 (0.008)	0.001 (0.003)	-0.005** (0.002)	0.002 (0.003)
Valpct	-0.019 (0.019)	-0.062 (0.092)	-0.011 (0.020)	0.004 (0.007)	-0.010 (0.017)	-0.003 (0.008)
Holding_MF	-0.002 (0.002)	-0.007*** (0.002)	0.000 (0.001)	-0.000 (0.000)	-0.001** (0.000)	0.000* (0.000)
Pctcash	0.048 (0.042)	-0.043 (0.099)	0.104*** (0.032)	0.016 (0.013)	-0.004 (0.025)	0.022 (0.014)
Hostile	-0.005 (0.090)	0.320 (0.304)	-0.057 (0.102)	0.001 (0.023)	0.077 (0.071)	-0.010 (0.029)
Diffind	-0.033 (0.023)	-0.058 (0.047)	-0.006 (0.029)	-0.014** (0.006)	-0.011 (0.010)	-0.019** (0.009)
Merger of equals	-0.058 (0.108)	0.081 (0.339)	-0.069 (0.072)	0.013 (0.043)	0.089 (0.071)	0.023 (0.051)
Tender	0.079* (0.041)	0.082 (0.105)	0.094* (0.051)	0.008 (0.009)	0.021 (0.017)	0.013 (0.011)
IMR	0.680*** (0.117)	0.793* (0.441)	0.383*** (0.143)	0.070** (0.030)	0.039 (0.079)	0.076** (0.035)
Year	0.004 (0.003)	0.009 (0.007)	0.001 (0.003)	-0.001 (0.001)	0.000 (0.002)	-0.000 (0.001)
Constant	-60.761*** (13.085)	-82.195* (42.534)	-31.841* (16.957)	-4.541 (3.213)	-3.540 (8.025)	-5.456 (3.462)
R-squared	0.378	0.453	0.445	0.393	0.491	0.535
Number of deals	908	389	519	903	389	514
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 21: Balancing tests of propensity score matching

This table reports the balancing test results of propensity score matching. The treated group includes deals with connected fund holdings, and the control group includes other deals. *B/M* is the book-to-market value of equity of a target of acquirer measured at the end of the last fiscal year before announcement. *Size_a* is the logarithm of the acquirer market capitalization at the last fiscal year before the announcement. *RELSIZE* is the ratio of the target's asset size to the acquirer's asset size at the end of the last fiscal year before the announcement. *Valpct* is the ratio of deal value to acquirer market capitalization at the end of the last fiscal year before announcement. *Holding_MF* is mutual fund holdings in a target firm one quarter before the acquisition announcement. *Pctcash* is the percentage of the stock payment in the consideration. *Diffind* is a dummy variable equals one for a deal where bidder and target are from different 3-digit SIC code industries and 0 otherwise. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Treated	Control	%bias	t-stats
B/M_t	0.544	0.624	-18.900	-1.030
Size_a	8.966	8.975	-0.500	-0.030
B/M_a	0.488	0.420	21.300	1.160
RELSIZE	0.799	0.231	20.400	1.110
Valpct	0.340	0.230	35.100	1.910*
Holding_MF	0.376	0.281	27.600	1.500
Pctcash	58.861	64.858	-13.800	-0.750
Diffind	0.237	0.288	-11.500	-0.620

Table 22: Propensity score matching results

This table reports the propensity matching results for deals announced between January 2000 and September 2019. Connected includes deals with holdings of connected hedge funds in a target firm one quarter prior to the acquisition announcement, and others include deals without connected fund holdings. *Completion* is a dummy variable that equals one if the deal is completed. *Duration* is the number of months between the deal announcement and the deal outcome. *Premium* is the premium paid one week (four weeks) before the announcement. *TCAR* and *ACAR* are the cumulative abnormal returns on target and acquirer over an event window of [0], [-1,1], [-3,3], and [-5,5], respectively. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. The missing values of t-stats indicate that all deals are completed in both groups, and there is no difference.

	Connected	Others	Difference	t-stats
Completion	1.000	1.000	0.000	.
Duration	124.421	125.579	-1.158	-0.080
Premium1	0.288	0.399	-0.111	-2.320**
Premium4	0.324	0.458	-0.134	-2.460**
TCAR	0.122	0.303	-0.181	-2.900***
TCAR1	0.199	0.368	-0.169	-2.780***
TCAR3	0.204	0.367	-0.163	-2.650***
TCAR5	0.202	0.369	-0.167	-2.690***
ACAR	-0.019	-0.010	-0.009	-1.040
ACAR1	-0.015	-0.008	-0.007	-0.530
ACAR3	-0.011	-0.003	-0.009	-0.690
ACAR5	-0.012	0.002	-0.014	-0.940

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