Does Shorttermism Shape up Mergers? Hedge Funds' Role in M&As

Ning Gao, Olga Kolokolova, Achim Mattes*

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Abstract

Using the information on M&A deals from January 1995 to June 2009, the paper shows that holdings of target firms by hedge funds do not destroy shareholder value or lead to higher completion probabilities as is often feared in press. Hedge fund holdings, however, do shorten the duration of negotiations in successful deals, and impact the means of payment leading to higher proportion of cash offered. At the same time, hedge funds are more likely to accept overvalued bidder stock than other investors. The impact is especially pronounced for holdings of funds with short-term investment horizon, larger portfolio size and those following Event Driven styles.

Key words: Hedge funds, holdings, shorttermism, mergers and acquisitions, deal duration, means of payment, CAR.

*Ning Gao (ning.gao@manchester.ac.uk) and Olga Kolokolova (olga.kolokolova@manchester.ac.uk) are at the University of Manchester, Alliance Manchester Business School, Achim Mattes (achim.mattes@uni-konstanz.de) is at the University of Konstanz. We thank Ashwini Agrawal, Michael Brennan, and all the participant of the AMBS research seminar for helpful comments.

1 Introduction

The involvement of hedge funds in the market of corporate control often fuels controversial discussions in press. In 2010 when a British confectionery company Cadbury was acquired by Kraft Foods, The Guardian questioned if it was "Time to prune hedge funds to protect UK's takeover system". According to Roger Carr, in the final stage of the deal short-term traders owned 31% of Cadbury. They seemed to made extremely lucrative profits, as "A 30p gain on an 800p share price – in just six weeks – represents an annualised gain of some 33%, a good return by any standards."[1] The popular fears are that the involvement of hedge funds with likely short-term investment horizon harms long term investors and other stake holders in the firms. These fears gave rise to various regulatory suggestions including, for example, restricting the voting rights of the shares bought during M&A negotiations.

Nevertheless, few academic studies have examined the impact of hedge funds on M&A deals. When considering the impact of hedge funds on real economy, majority of research papers focus on one type of hedge funds, namely, the activists funds. The research spans the impact of activists hedge funds on firm performance and productivity [Brav et al., 2008], its bond holders [Xu and Li, 2010, Klein and Zur, 2011], and other related firms [Aslan and Kumar, 2016, Gantchev et al., 2016], as well as performance of target firms in M&A deals which are subject to activism [Boyson et al., 2016]. All these papers come to the conclusion that hedge fund activism enhances shareholder value by monitoring management and improving firm productivity.

Although such "good guys" of the hedge fund industry play a very important role in making real economy firms more efficient, they are not the most common type of hedge funds. According to the HFR industry report[2], as of the second quarter of 2015, the assets under management of the activist hedge funds reached about USD 130 billion, whereas the total estimated size of the hedge fund industry over the same period was approaching USD 3 trillion. Our paper closes this gap in the literature by providing empirical evidence on how broader classes of hedge funds (with various investment horizons, skill levels, portfolio sizes, and strategies) impact real economy in the context of the market of corporate control.

[1] `https://www.theguardian.com/business/2010/feb/09/hedge-funds-mergers-takeovers`

[2] https://www.hedgefundresearch.com/

We analyse M&A deals from January 1995 to June 2009. Contrary to the fears expressed in the press, we do not find empirical support for value destruction by hedge funds. On average, we find no significant effect of hedge fund holdings on bidder and target announcement returns. This suggests that even if hedge fund profit from investing in M&A deals (thus, benefiting their own investors), they do not affect value creation in mergers or redistribution on gains between bidders and targets. Consistent with this finding, hedge fund holdings do not increase the deal completion probabilities either, suggesting no active involvement of hedge funds in the process. Instead, hedge funds seem to be skillful in picking up the firms which are likely to be successful targets. This is achieved, for example, by not investing in overvalued firms to start with. Hedge fund holdings do increase the probability of a tender offer being made. Their impact, however, is not statistically different from that of other institutional investors, which usually do not have the stigma of being speculative short-term investors.

Nevertheless, we find that there are several other characteristics of M&A deals which are changed significantly by the presence of hedge funds. Holdings by hedge funds with short-term investment horizons, in particular, substantially decrease the duration of negotiations, especially for all stock deals. The impact is further amplified if hedge funds hold concentrated portfolios and invest in stocks with high idiosyncratic risk.

Higher hedge fund holdings also lead to a larger share of cash offered as consideration as opposed to stock. The preference for cash is especially strong among funds with high past alpha and of smaller size, indicating strong preference of immediate liquidity of hedge funds.

At the same time, if a stock offer is made, hedge fund holdings in a target increase the likelihood of accepting overvalued bidder stock as payment. Hedge funds are even more likely to accept overvalued bidder stock if they have a short-term investment horizon, hold portfolios with high idiosyncratic volatility, are of larger size or follow Event Driven styles. This result is consistent with the model of Shleifer and Vishny [2003], that suggests that rational short-term investors are less resistant to accepting overvalued bidder stock.

Our study contributes to a burgeoning literature on the impact of hedge funds on financial markets and the real economy [Mitchell et al., 2004, Brav et al., 2008, Aragon and Spencer Martin, 2012, Ben-David et al., 2013, Burkart and Lee, 2015, Boyson et al., 2016]. Prior studies

largely focus on the impact of hedge fund activism on corporate governance and investment decisions. We demonstrate that the dominant types of hedge funds do not destroy shareholder value if they are involved in M&As, contrary to popular fears. At the same time, their natural preference for liquidity and shorttermism has fundamental effects on real corporate investment processes, strongly influencing the chosen means of payment in the M&A deals, in particular.

2 Related Literature

Our paper contributes to the strand of literature analysing the factors that affect M&A deals, their terms and conditions, as well as success and investor returns, and the role of various types of investors/stackeholders/traders in shaping up the deals. This includes institutional ownership [Nain and Yao, 2013, Fich et al., 2015, Bodnaruk and Rossi, 2016] and ownership by other investors [Caprio et al., 2011, Kim and Ouimet, 2014].

Bodnaruk et al. [2009] study holdings of financial conglomerates in merger and acquisition targets when affiliated investment banks advise the bidders. Such holdings are positively related to the probability of a bid, completion probability, the target premium, and the termination fees. However, such deals do not seem to be wealth creating in the long run. Similar results but for activist hedge funds holding are found by Boyson et al. [2016]. Our paper is closely related to the latter, as we also investigate the impact of hedge fund holdings on M&A deals. However, contrasting to Boyson et al. [2016], we focus on another group of hedge funds, which we label "shorttermists". These funds do not intend to actively participate in the governance of the target firm, instead they seek to cash in faster and gain the premium the bidder pays for the target in the deal.

The impact of short-term investors was empirically found to be important for asset pricing. Mitchell et al. [2004], e.g., describe trading strategies that take place around different types of mergers and the corresponding price pressure. They show that substantial share of negative returns that bidders experience is due to short selling pressure of speculators and not bad news on the deal itself.

Our paper is also related to the strand of literature investigating the the potential impact

of hedge funds onto various markets. Using hand-collected data, Brav et al. [2008] study activist hedge funds. They find that the market reacts with a positive abnormal return on an activism announcement, which reflects improved operational performance of target firms after the involvement of an activist hedge fund. At the same time, there is some evidence that hedge funds may manipulate the markets. Ben-David et al. [2013] show that stocks held by HFs exhibit positive abnormal return on the day preceding the day, on which hedge funds are required to report their holdings to the SEC. The next day, these stocks exhibit price reversal. This pattern is stronger for more illiquid stocks and for funds with good past total returns, poorer reporting return quality, with past history of price manipulation, and during quarters with low market return. At the same time, Cao et al. [2014] show that hedge fund trading improves efficiency of stock prices, but not during the times when hedge funds experience funding liquidity shocks.

Another area of research focuses on managerial skills and predictive power of hedge fund holdings for future stock returns. Using the 13F filings of 306 hedge fund companies from 1980 to 2004, Griffin and Xu [2009] show that hedge funds only marginally outperform mutual funds based on value weighted portfolios, and do not do so based on equal weighted portfolios. At the same time, hedge funds have twice as large turnover of their portfolio compared to mutual funds. The portfolio weights deviate more from the market portfolio. They overweight medium-size value stocks, less liquid and more volatile stocks, as well as stocks followed by less analysts. Hedge fund holdings do not predict future return and their returns are not persistent. These findings point towards the absence of any superior skills of hedge fund managers. The contrasting results are obtained by Aragon and Spencer Martin [2012] who again use 13F filings of 250 hedge fund companies from 1999 to 2006 together with the hand-collected option holding data. They show that hedge fund stock positions predict future returns. Option holdings predict both future returns and volatilities of the underlying stocks. A tracking portfolio based on hedge fund option holdings has positive abnormal return, all pointing towards the existence of superior stock picking skill by hedge fund managers. Related result is found by Agarwal et al. [2013]. The authors use confidential holdings from 13F filings of 106 out of 942 identified hedge fund companies from March 1999 to June 2007. They show that funds are more likely to use confidential holdings if they are large, have concentrated portfolios with high idiosyncratic risk,

or follow Event Driven, Multi-Strategy, and Relative Value Arbitrage strategies. The stocks from the confidential reports are more likely to be associated with information sensitive events (such as mergers and acquisitions), and they exhibit higher abnormal returns compared to other holdings reported to 13F filings. The authors do not find any managerial skill associated with "normal" holdings, but do find skill in confidential hedge fund holdings.

Our paper stands on the intersection of these various strands of literature. It contributes to our knowledge base by analysing the link between holdings of broader classes of hedge funds and the terms and conditions, as well as success of M&A deals, and the resulting impact on other types of investors.

3 Research design

We start this section by formulating our hypothesis about the potential role of hedge funds (HFs) on the outcomes and terms of M&A deals. We take a "negative" standpoint with respect to HF involvement, assuming them to be short-term proactive speculators and manipulators.

3.1 Hypotheses

From the HFs' point of view, there is a clear trade-off between the speed of deal completion and the price received. Negotiating higher price could lead to higher abnormal returns for the target, and lower for the bidder. Pushing for faster deal completion can have the opposite effect. If shorttermism dominates, as is feared, then faster deal completion is likely to lead to lower premiums paid and thus relative gains for the bidder and losses for the target.

H1: Holdings of HFs decrease targets' CAR and increase bidders' CAR around the deal announcement.

Shorttermists hedge funds (HFs) do not hold any stocks over long horizon, and are generally interested in speedy money recovery. If they are pushing for acceptance of lower payment form the bidder, they should facilitate the negotiations and increase the deal completion probability.

H2: Holdings of HFs increase the deal completion probability.

As the holdings of HFs in targets are observed before the announcement, they may affect the strategy of a bidder. In particular, knowing that HFs are likely to be willing to exit faster and do not wish to participate in the governance of the joint firm, a bidder can expect them to be willing to sell the target shares in response to a tender offer.

H3: Holdings of HFs increase the probability of a tender offer.

HFs are also conscious about the increasing risk of not completing a deal if the process is prolonged. Thus, HFs are likely to try to resolve the deal faster.

H4: Holdings of HFs decrease deal duration.

Being short term investors, HFs also have strong preference for liquidity. They usually do not intend to keep any control rights in the firms subject to M&A over long horizon. Thus, we hypothesise that HF are more likely to prefer cash payment to stock. At the same time, as the model of Shleifer and Vishny [2003] predicts, short term stake holders in target firms can rationally accept payments by overvalued stocks of a bidder. Thus, in cases in which stock offers are made, we can expect HFs to be more inclined to accept overvalued stock of a bidder compared to other investors.

H5 a: Holdings of HFs increase the percentage of cash offered.

H5 b: Holdings of HFs decrease the percentage of stock offered.

H5 c: If stock is offered, holdings of HFs increase the likelihood of accepting overvalued bidder stock.

3.2 Methodology

In order to test the hypotheses from Section 3.1, we run logit models for probabilities of deal completion and tender offer, and ordinary least square regressions for deal duration and bidder and target CARs, and Tobit models for percentages of cash and stock offered[3]. In all the regressions, we use an extensive list of M&A control variables, which can affect deal duration and completion probability, means of payment and CAR, as discussed in Section 3.4, as well

[3]As a robustness check, we also run linear regression for means of payment and received very similar results.

as year and industry fixed effects. We also include a dummy variable for positive HF holdings ($HFhold > 0$) as of the last quarter before the deal announcement to capture the selection of targets by HFs.

The regressions are run in two stages. First, we include (together with the control variables) the percentage HF holdings in target as of the last reporting quarter before deal announcement ($HFhold$). This variable captures overall impact of HF holdings on M&A deals. These variable, however, is a melting pot of holdings of various types of HFs, with different goals and investment horizons. Thus, in the second stage, we split HF holdings according to various HF characteristics. $HFhold(Factor_{low/high})$ indicates the holdings of HFs with low/high level of a given characteristic. We focus on the length of HF investment horizon, dynamism of their investment strategy, skill, and fund size. We detail our measures of these HF characteristics in Section 3.3 below. To address the hypothesis of the likelihood of accepting overvalued stock of a bidder, we include the product of HF holdings and the bidder overvaluation measure in the regression for means of payment.

Thus, our two main specifications are as follows:

$$Y_{M\&A} = f\left(HFhold > 0, HFhold, Controls\right) + \varepsilon, \tag{1}$$

$$\begin{aligned} Y_{M\&A} = {} & f(HFhold(Factor_{low}) > 0, HFhold(Factor_{high}) > 0, \\ & HFhold(Factor_{low}), HFhold(Factor_{high}), Controls) + \varepsilon. \end{aligned} \tag{2}$$

Here, $Y_{M\&A}$ is the characteristic of an M&A deal under consideration. We use CAR of bidders and targets earned +/- 2 days around the announcement ($CAR_{a/t}[-2;+2]$) to test *H1*. For *H2*, the dependent variable takes a value of one for competed deals and zero otherwise. The dependent variable in *H3* takes a value of one for tender offer deals ($tend$) and zero otherwise. Deal duration ($ddur$) is measured in days from the announcement day to the date of deal completion or withdrawal for *H4*. Means of payment are measured by the percentage of cash offered ($pctcash$) and percentage of stock offered ($pctstock$) to test our hypotheses *H5 a, b, c*. $f(\cdot)$ is a regression model to estimate, which is either a logit, liner, or tobit model depending on the specification. ε is the corresponding error term.

3.3 Measuring HF shorttermism, dynamism, and skill

In order to distinguish between short-term and longer-term horizons of HFs, we follow Griffin and Xu [2009] and Agarwal et al. [2013], and for each HF compute the average portfolio turnover ($\overline{turn}$). The measure captures the intensity with which HFs update portfolio composition. The higher the turnover, the more dynamic and active HF is. The holding period of individual stocks is, thus, smaller, and higher portfolio turnover implies shorter investment horizon of a HF. For each HF, its turnover is the average across T quarters, during which the HF reports holding information, of the ratio of the minimum of sales and purchases during the quarter τ to the reported portfolio size at the end of the previous quarter $PortSize_{\tau-1}$. The minimum of purchases and sales is taken to capture the intrinsic dynamism of a HF, clean from the impact of flow driven trades.[4]

$$\overline{turn} = 1/T \sum_{\tau=t_1}^{t_T} \frac{min(Purchases_\tau, Sales_\tau)}{PortSize_{\tau-1}} \tag{3}$$

We split HFs into funds with short-term/long-term investment horizon groups according to their average turnover being above/below the median.

We also divide HFs into two groups according to how actively they manage their portfolios. As suggested by Agarwal et al. [2013], more active HFs tend to have higher portfolio concentration, invest in stocks with higher idiosyncratic volatility, and generally manage larger portfolios. We compute the related measures for each HF, and again classify funds into more active funds if their Herfindahl index, average portfolios idiosyncratic risk, or log size is above the median.

The Herfindahl index ($Herf$) is computed for each HF each quarter, based on the reported holdings. It captures the portfolio concentration of a HF. On the one hand, HFs with highly concentrated portfolios are found to be more skillful and earn higher returns on such holdings [Agarwal et al., 2013]. On the other hand, such funds are less diversified and would be more inclined to faster completion of M&A deals should they be involved in any. The Herfindahl index is calculated using the market value of each stock ($value_j$) in a HF portfolio.

[4] As a robustness check, we also consider the median portfolio turnover ($\widetilde{turn}$) for each fund across all reporting quarters.

$$Herf = \sum_j \left(\frac{value_j}{\sum_j value_j} \right)^2 \tag{4}$$

The average idiosyncratic volatility ($ResVol$) is estimated for each HF each quarter. It is computed as the average of the residual volatility from the Carhart [1997] 4-factor model, fit to each stock in a HF portfolio using past quarter daily returns.

The log portfolio size of a HF is a natural logarithm of the market value of all stocks held by hedge fund each quarter ($logPortSize = \ln(PortSize_{i,t})$). Funds managing large portfolios may be subject to the limited attention phenomenon and not be able to devote enough time to monitoring each individual stock or deal.

In order to proxy for general HF skill level, we also use individual fund's alpha estimated relative to the Fung and Hsieh [2004] seven factors. The regressions are run for each individual fund using three years of data prior to the M&A announcement, leaving a one year gap before the announcement in order to avoid potential contamination of the returns by the information of the forthcoming deal. We identify "skillful" funds, if their estimated alpha is above the median across other funds reporting over the same period.

There are particular styles of HFs, such as Event Driven, Multi-Strategy, and Relative Value Arbitrage, which are more likely to be associated with event-specific private information [Agarwal et al., 2013]. We use holdings of these particular categories of HFs ($EvDrHold$) separately from all other styles. Although these funds may possess some private information about deals or be more skillful in picking up targets, they often impalement arbitrage strategies which are short term by their nature.

3.4 M&A related control variables

In order to capture all other potential determinants of our dependent, we control for an extensive set of variables suggested by literature. Table 1 lists all the variables in the alphabetic order, together with their definitions and relevant references.

Bidder and target overvaluation are measured as the ratio of the firm market value to its fundamental value. We follow Lee et al. [1999] and Dong et al. [2006] and use a residual

income valuation model when computing the fundamental value of the firms. We use a three-year horizon to calculate terminal value of the firms, obtain the discount rate for individual companies based on 5 years (minimum 2 years) of prior monthly returns and the CAPM, and winsorized the values at 1% and 99% before including them into the regressions.

Table 1: M&A control variables

The table lists the control variables used in our empirical analysis, their definition and the relevant sources from the literature. Sub-indices a/t indicate Acquiror/Target.

Variable	**Description**	**Reference**
$bharvw_{a/t}$	Buy-and-hold abnormal return over a 12-month period stopping 2 months before announcement, relative to the value weighted nyse/amex/nasdaq index	Morck et al. [1990], Faccio and Masulis [2005]
$bm_{a/t}$	B/M, the last fiscal year before announcement	Manne [1965], Palepu [1986], Morck et al. [1990], Martin [1996], Faccio and Masulis [2005]
$cap_{a/t}$	Market cap($mil), the last fiscal year before announcement	Martin [1996], Officer [2003], Moeller et al. [2004], Faccio and Masulis [2005]
$collateral_{a/t}$	Tangible assets over total assets	Faccio and Masulis [2005]
$divyield_{a/t}$	Dividend yield	
$fcfa_{a/t}$	Ratio of free cash flow to total assets	Jensen [1986],Lang et al. [1991],Schlingemann [2004]
$hhsalesic3_{a/t}$	Sales-based Herfindahl-Hirschman index for 3-digit SIC code	Giroud and Mueller [2010, 2011]
$insthold_{a/t}$	Institutional holdings in acquirer/tarhet	Martin [1996], Faccio and Masulis [2005]
$levmkt_{a/t}$	Market leverage	
$lm12_{a/t}$	Liquidity measure as in Liu (2006)	Liu [2006], Betton et al. [2014]
$overval_{a/t}$	Overvaluation measure as of the announcement date	Lee et al. [1999], Dong et al. [2006]
$pe_{a/t}$	Price earnings ratio	
$phda$	Percentage held by acquiror in the target at announcement	Choi and Lee [1991]
$roa_{a/t}$	Return on assets	Morck et al. [1990]
$saleg_{a/t}$	Sales growth in the past 3 years	Morck et al. [1990]
$swap$	Swap dummy taking a value of one if at least 50% of the consideration is paid in stock	
$tend$	Tender offer dummy. 1 for tender offers and 0 otherwise.	Jensen and Ruback [1983], Martin [1996], Officer [2003], Betton et al. [2014]
$valpct$	Deal value in percent of acquiror market cap as of the end of fiscal year before the deal announcement	Martin [1996], Faccio and Masulis [2005]

4 Data

The current empirical research is based on three blocks of data: (1) detailed information on M&A deals, (2) a HF database , (3) HF holdings as reported through 13F filings to the Security and Exchange Commission (SEC).

Our initial acquisition sample is from the Security Data Corporation (SDC) mergers and acquisitions (M&A) database. These acquisitions are completed or withdrawn during January 1995 to June 2009. We only include the major types of acquisitions, namely, mergers and acquisitions of majority interests.[5] We require both the bidder and the target to be public firms, as hedge fund holdings are available only for public firms. We require deal value to be at least $1 million to ensure the deal is large enough to have price impact on the bidder. To mitigate problems associated with recording error, we require the sum of the percentages of stock, cash, and mixed payments to be between 95% and 105%. The initial sample contains over 4,400 deals. We use only those deals for which majority of the variables can be computed using the available data from CRSP and Compustat. We exclude targets that have multiple bids over the sample period, as well as those targets that have multiple share classes with different voting rights. We then winsorized all the variables at the 1% and 99% levels. The final sample includes around 1,800 deals and its descriptive statistics are reported in Table 2. The upper panel reports the descriptive statistics of the characteristics used as the dependent variables, the lower panel reports the characteristics which later serve as controls.

As the source of HF data, we use a union of six major databases (Barclayhedge, CISDM, Eurekahedge, Morningstar, TASS) previously used in Hodder et al. [2014]. Large HF investment companies are required to quarterly report to the SEC their long equity positions though 13F filing if the size of the company exceeds USD100 million, it is registered in the US, and its holdings in the US companies' stocks either exceeds 10,000 shares or USD200,000 in market value. Since the holding data are on the company level, we aggregate individual funds in the respective companies. We follow Mattes [2011] and obtain the holding information from the CDA database (Thomson Reuters, 13F filings). We use only those HF companies that do not

[5]These transactions are defined by the SDC and are commonly used in M&A studies. In a merger, all shares outstanding of the target are acquired by the acquirer. In an acquisition of majority interests, the acquirer holds less than 50% of the target before the transaction and more than 50% after the transaction.

have a mutual fund business as well. The sample period matches the one of the acquisition information and is from January 1995 to June 2009. Altogether, we have information on 1,050 HF companies and 8,879,150 holdings reported (HF company - quarter - security). Table 3 reports the descriptive statistics of hedge fund holdings together with their portfolio characteristics discussed in section 3.3. An portfolio of an average fund consists of about 179 individual firms and 497 thousand of shares. Individual firms subject to take over attempts cover just about 35b.p. in terms of share value of the total HF portfolio.

Table 4 reports the correlation coefficient between quarter-fund estimates of the HF characteristics. Generally, the correlation coefficient are very low. The highest one of 23% is between the HF alpha and its residual portfolio volatility. Indicating that funds that follow less market driven strategies are more likely to outperform, at least relative to the Fung and Hsieh [2004] 7-factor model.

On the last step, we use 6-digit CUSIP identifiers to match the firms in our M&A sample with the HF companies. On average, HFs hold around 9% of stocks of target firms as of the last quatre prior to the deal announcement. This number is not negligible, however, it is smaller compared to the average 37% holdings of other institutional investors as reported in Table 2.

Table 2: Descriptive statistics of M&A deals

The table reported the descriptive statistics of our sample of M&A deals, after all the filtering and winsorizing is imposed. The dependent variable include bidder and target CARs around the announcement ($CAR_{a/t}[-2;+2]$), CARs over one month after deal announcement ($CAR_{a/t}[+2;+30]$), an indicator variable that takes a value of one for successfully completed deals ($cmplDum$), deal duration in days ($ddur$), as well as percentage of stock and cash offered as means of payments ($pctcash$ and $pctstock$). The description of other control variables is detailed in Table 1.

	Mean	Median	STD	Min	Max	N Obs
$CAR_a[-2;+2]$	-0.01	-0.01	0.09	-0.28	0.26	1810
$CAR_t[-2;+2]$	0.21	0.17	0.23	-0.24	1.01	1828
$CAR_a[+2;+30]$	-0.03	-0.02	0.15	-0.50	0.38	1810
$CAR_t[+2;+30]$	0.00	0.00	0.16	-0.46	0.50	1828
$cmplDum$	0.89	1.00	0.31	0.00	1.00	1829
$ddur$	137.01	119.00	91.55	0.00	906.00	1829
$pctcash$	40.31	17.00	44.27	0.00	100.00	1829
$pctstock$	52.21	60.00	45.08	0.00	100.00	1829
$bharvw_a$	0.09	0.00	0.55	-0.79	3.06	1812
$bharvw_t$	-0.06	-0.15	0.60	-1.18	8.34	1826
bm_a	0.58	0.41	1.51	0.00	52.55	1767
bm_t	0.76	0.54	0.76	0.03	4.77	1829
cap_a	7677.16	1116.05	25883.34	1.85	571197.28	1829
cap_t	972.52	135.96	4092.16	0.90	85280.23	1829
$collateral_a$	0.29	0.21	0.24	0.00	0.96	1759
$collateral_t$	0.29	0.24	0.24	0.00	0.95	1829
$divyield_a$	1.97	0.05	5.63	0.00	37.03	1771
$divyield_t$	0.52	0.00	1.85	0.00	13.52	1829
fcf_a	0.05	0.06	0.36	-12.82	2.97	1750
fcf_t	0.03	0.07	0.40	-4.93	6.54	1819
$hhsalesic3_a$	0.15	0.10	0.13	0.03	0.70	1504
$hhsalesic3_t$	0.15	0.11	0.13	0.02	0.98	1549
$insthold_a$	0.50	0.52	0.27	0.00	1.03	1829
$insthold_t$	0.37	0.30	0.28	0.00	1.01	1829
$levmkt_a$	0.14	0.10	0.14	0.00	0.87	1641
$levmkt_t$	0.14	0.10	0.15	0.00	0.75	1829
$lm12_a$	2557.97	0.00	12440.76	0.00	94624.51	1734
$overval_a$	4.60	1.67	8.52	0.01	37.31	1829
$overval_t$	6.07	1.93	7.06	0.02	17.29	1829
pe_a	16.54	15.40	50.39	-202.33	294.45	1776
pe_t	13.19	12.19	48.67	-199.92	252.89	1829
$phda$	1.22	0.00	6.41	0.00	88.20	1829
roa_a	0.01	0.04	0.24	-3.45	2.11	1776
roa_t	-0.03	0.03	0.21	-1.07	0.23	1829
$saleg_a$	0.34	0.14	1.46	-1.00	44.03	1674
$saleg_t$	0.23	0.11	0.47	-0.43	2.64	1829
$swap$	0.59	1.00	0.49	0.00	1.00	1829
$tend$	0.18	0.00	0.38	0.00	1.00	1829
val	1132.24	198.71	3006.37	5.15	21375.71	1829
$valpct$	0.45	0.22	0.64	0.01	4.52	1829

Table 3: HF holdings descriptive statistics

The table lists the descriptive statistics of HF holdings, together with their portfolio characteristics including the average portfolio turnover ($turn$), portfolio Herfindahl index ($Herf$), average residual volatility of the stocks held ($ResVol$), the alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), as well as the log portfolio size ($logPortSize$).

	Mean	STD	5%	25%	50%	75%	95%
N-shares(thousands)	496.81	2979.10	1.30	15.60	66.00	277.01	1861.47
N-firms held	178.75	350.30	10.00	34.37	69.33	175.40	743.86
$turn$	0.55	2.76	0.05	0.13	0.23	0.42	0.84
$Herf$	0.04	0.07	0.01	0.01	0.02	0.04	0.15
$ResVol$	0.02	0.01	0.01	0.02	0.02	0.03	0.04
$Alpha$	0.01	0.01	-0.01	0.00	0.01	0.01	0.03
$PortSize$ (billion USD)	4.69	25.53	0.06	0.20	0.61	2.11	15.64
Target in HF port (%)	0.35	1.31	0.00	0.00	0.02	0.20	1.67

Table 4: Correlation coefficients between HF characteristics

The table lists the correlation matrix between HF characteristics including the average portfolio turnover ($turn$), portfolio Herfindahl index ($Herf$), average residual volatility of the stocks held ($ResVol$), the alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), as well as the log portfolio size ($logPortSize$).

	$Herf$	$ResVol$	$Alpha$	$logPortSize$
$turn$	0.00	0.05	0.01	0.08
$Herf$		0.08	0.05	-0.03
$ResVol$			0.23	-0.06
$Alpha$				-0.03

5 Empirical Results

We, first, perform the univariate analysis and sort all M&A deals into four portfolios according to HF holdings. We then move to the in depth multivariate analysis and formally test our hypotheses.

5.1 Univariate analysis

Table 5 reports the descriptive statistics of the main variables of interest across four groups of M&A deals sorted in quartiles according to percentage HF holdings as of the last quarter prior to deal announcement. Q1 contains 25% of deals with the lowest HF holdings as of the last quarter prior to the deal announcement, and Q4 contains the deals with 25% highest percentage HF holdings. The last two columns report the difference in means between Q4 and Q1, and the corresponding p-value.

Table 5: M&A deal characteristics sorted by HF holdings

The table reports the descriptive statistics of the dependent variables together with bidder and target overvaluation ($overval_{a/t}$) for all deals, as well as sorted into 4 quartile portfolios according to percentage HF holding as of the last quarter prior to the date of deal announcement ($HFhold$). Q1 contains deals with the lowest HF holdings, Q4 includes deals with the highest HF holdings. The last two columns report the mean difference and the corresponding p-value for the two-sample t-tests of difference in means.

	All		**Sorted on HF Holdings**									
			Q1		Q2		Q3		Q4		Q4-Q1	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean diff**	**p-value**
$HFhold$	0.09	0.06	0.00	0.00	0.03	0.03	0.10	0.10	0.24	0.22	0.24	0.00
$CAR_a[-2;+2]$	-0.01	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.36
$CAR_t[-2;+2]$	0.21	0.17	0.21	0.17	0.21	0.17	0.20	0.16	0.22	0.19	0.01	0.71
$cmplDum$	0.89	1.00	0.86	1.00	0.93	1.00	0.89	1.00	0.89	1.00	0.04	0.11
$tend$	0.18	0.00	0.13	0.00	0.20	0.00	0.20	0.00	0.18	0.00	0.05	0.04
$ddur$	137.01	119.00	145.77	138.00	142.07	126.00	140.35	114.00	119.86	99.00	-25.91	0.00
$pctcash$	40.31	17.00	36.71	0.00	38.29	0.30	39.69	17.35	46.54	41.00	9.82	0.00
$pctstock$	52.21	60.00	54.63	65.50	53.70	69.55	52.93	60.00	47.57	48.00	-7.06	0.02
$overval_a$	4.60	1.67	4.45	1.66	5.16	1.91	4.92	1.92	3.86	1.27	-0.59	0.27
$overval_t$	6.07	1.93	10.20	17.29	6.36	2.08	4.35	1.64	3.40	1.25	-6.80	0.00

The descriptive statistics shed some light on the plausibility of our main hypotheses. Abnormal returns do not seem to exhibit any pattern across the deals with various levels of HF holdings either for bidder or target, suggesting no value creation, destruction, or re-distribution related to HF involvement.

The deal completion probability increases from Q1 (lowest) to Q4 (highest) of HF holdings, but the differences between Q1 and Q4 is not statistically significant.

As for the probability of a tender offer, for deals with low HF holdings (Q1), it is 13%, whereas for deals with high HF holdings (Q4) it increases to 18%. The difference in significant at the 5% level.

Deal duration monotonically decrease from Q1 to Q4. The difference in average deal duration between Q4 and Q1 is highly statistically significant. This finding is consistent with the view that higher HF holdings (thus more liquid shareholder base) facilitate the process and completion of M&A transactions.

As far as the means of payment is concerned, higher cash offers are associated with large hedge fund holdings. Median percentage of cash offered is 41% for Q4, contrasting with 0% for other portfolios. The mean differences in the percentage of cash and stock in question between Q4 and Q1 are statistically significant at the 1 and 5% levels respectively.

The bidder overvaluation increases from Q1 to Q3, and then drops for Q4. This pattern may suggest a trade-off between HFs' willingness to accept overvalued stock payment and exit the deal sooner and their incentives and capability of negotiating for a higher price.

An interesting pattern is observed with respect to target overvaluation. It monotonically decreases from Q1 to Q4, suggesting that HFs tend not to hold overvalued targets for which the immediate gains from the merger may be smaller. The difference between Q4 and Q1 is highly statistically significant. This observation can also be related to the general stock picking skills of HFs, which do not invest in overpriced stocks.

5.2 Bidder and target abnormal returns

Similar to the indicative univariate results, we do not find any significant link between HF holdings and bidder or target CAR around the announcement. We consider both the immediate market reaction through CAR around the announcement date $CAR_{a/t}[-2;+2]$, and a longer term reaction over a month after the announcement though $CAR_{a/t}[+2;+30]$. We also split the deals into completed ones and withdrawn. Still, the result remains the same: we do not find any support of the hypothesis that HF holdings destroy target shareholder value or increase bidder shareholder value. The estimation results are reported in Table 6.

We look further into possible variation of the impact of holdings of different types of hedge funds on CARs. Specifically, we consider HFs with short-term investment horizon and a high turnover ($turn$), concentrated portfolios and high Herfindahl index ($Herf$), high portfolio idiosyncratic risk ($ResVol$), high skill measured by alpha ($Alpha$), large size ($logPortSize$), and corporate-event related styles ($EvDrHold$). We see a marginally negative impact on the short-term bidder CAR by holdings of Event Driven funds (Table 7), and there is no impact of any other group of hedge funds. Holdings by HFs with less concentrated portfolios and of larger size lead to significantly higher target CAR upon the announcement (Table 8). These results suggest that if anything, some HFs can benefit target shareholders, and no shareholder value is destroyed.

Table 6: Bidder and target CARs

The table reports the estimation results for the linear regression for bidder and target CARs. Column I and II report the results for the short-term CAR of the bidder around the announcement ($CAR_a[-2;+2]$) and the CAR earned over one months after the announcement ($CAR_a[+2;+30]$) respectively. Column III and IV report the results for the corresponding CAR of a target. $HFhold > 0$ and $insthold > 0$ are dummy variables taking a value of one if there are non-zero holdings of HFs and other institutional investors in the target respectively. *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in brackets.

	CAR_a[-2;+2]			CAR_a[+2;+30]			CAR_t[-2;+2]			CAR_t[+2;+30]		
	All	Compl.	Withd.	All	Compl.	Withd.	All	Compl.	Withd.	All	Compl.	Withd.
fcf_t	-0.03	-0.03	-0.00	-0.10**	-0.10*	0.19	-0.03	-0.04	-0.19	-0.10**	-0.09	-0.37*
	(-1.08)	(-0.90)	(-0.01)	(-2.12)	(-1.93)	(1.02)	(-0.38)	(-0.53)	(-0.60)	(-2.02)	(-1.54)	(-1.69)
fcf_a	0.02	0.02	0.03	0.16***	0.14***	0.35**	0.14**	0.14**	-0.02	0.09**	0.08*	0.18
	(0.85)	(1.03)	(0.26)	(4.46)	(3.58)	(2.05)	(2.43)	(2.27)	(-0.06)	(2.20)	(1.93)	(0.93)
bm_t	0.00	0.01	-0.03*	-0.01	-0.01**	0.03	-0.02*	-0.02*	0.02	-0.02***	-0.02**	-0.01
	(0.33)	(1.35)	(-1.80)	(-1.15)	(-2.12)	(1.27)	(-1.76)	(-1.78)	(0.57)	(-2.64)	(-2.22)	(-0.55)
cap_t	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.00	-0.01	-0.00	-0.00	-0.00
	(0.60)	(1.18)	(-0.92)	(-0.18)	(0.21)	(-0.06)	(0.02)	(0.45)	(-0.90)	(-1.32)	(-0.90)	(-0.37)
$bharvw_a$	-0.02***	-0.02***	-0.09**	-0.07***	-0.06***	-0.25***	0.00	0.00	-0.08	-0.01*	-0.01	-0.17**
	(-5.35)	(-4.58)	(-2.36)	(-9.26)	(-8.66)	(-4.45)	(0.19)	(0.36)	(-0.90)	(-1.85)	(-1.16)	(-2.65)
roa_t	-0.03	-0.04	-0.00	0.08**	0.08**	0.10	-0.00	0.03	-0.12	0.08**	0.06	0.35***
	(-1.49)	(-1.61)	(-0.05)	(2.34)	(2.00)	(0.93)	(-0.03)	(0.41)	(-0.68)	(2.07)	(1.42)	(2.86)
$hhsalesic3_a$	0.01	0.01	0.48	0.10**	0.10**	0.80	0.05	0.05	1.32	0.09*	0.09**	0.28
	(0.45)	(0.23)	(1.45)	(2.55)	(2.41)	(1.57)	(0.73)	(0.74)	(1.56)	(1.96)	(2.01)	(0.48)
$lm12_a$	0.00	0.00	0.00	0.00***	0.00**	0.00*	-0.00***	-0.00**	0.00	0.00	0.00	0.00
	(1.59)	(0.89)	(1.50)	(2.58)	(2.42)	(1.76)	(-2.63)	(-2.55)	(1.00)	(0.82)	(0.82)	(1.31)
$phda$	0.00	0.00	0.00	0.00	-0.00	0.01**	-0.00**	-0.00**	-0.00	0.00	0.00	0.01
	(0.31)	(0.76)	(0.89)	(0.14)	(-0.60)	(2.32)	(-2.05)	(-1.98)	(-0.49)	(0.58)	(0.49)	(1.10)
$overval_t$	-0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00
	(-0.38)	(-0.10)	(0.15)	(0.93)	(0.83)	(-0.73)	(0.67)	(0.37)	(0.11)	(1.31)	(1.00)	(-0.78)
$overval_a$	0.00	0.00	-0.00	-0.00	-0.00	-0.00*	-0.00	-0.00	0.00	-0.00	0.00	-0.00
	(0.86)	(0.83)	(-0.14)	(-0.55)	(-0.22)	(-1.73)	(-0.26)	(-0.57)	(0.03)	(-0.20)	(0.01)	(-0.92)
$insthold$	0.00	0.01	-0.06	0.00	-0.00	-0.00	-0.03	-0.03	0.04	0.02	0.01	-0.06
	(0.25)	(0.44)	(-0.83)	(0.10)	(-0.10)	(-0.04)	(-0.79)	(-0.77)	(0.20)	(0.61)	(0.25)	(-0.46)
$insthold > 0$	0.00	-0.01	0.00	0.02	0.01	-0.08	0.05	0.01	0.57***	0.01	-0.01	0.13
	(0.21)	(-0.43)	(0.01)	(0.68)	(0.36)	(-0.68)	(1.15)	(0.29)	(2.87)	(0.51)	(-0.32)	(0.98)
$HFhold > 0$	0.01	0.01*	0.00	0.02	0.02	0.11*	-0.03	-0.03	-0.06	0.02	0.03*	0.12*
	(1.41)	(1.65)	(0.11)	(1.43)	(1.11)	(1.93)	(-1.27)	(-1.32)	(-0.61)	(1.55)	(1.83)	(1.85)
$HFhold$	-0.03	-0.03	-0.07	-0.02	-0.01	-0.10	0.11	0.11	-0.36	-0.01	0.01	-0.38
	(-0.81)	(-0.91)	(-0.37)	(-0.37)	(-0.21)	(-0.37)	(1.29)	(1.17)	(-0.79)	(-0.09)	(0.14)	(-1.23)
Constant	-0.01	-0.06*	0.09	-0.01	-0.03	0.36	0.23***	0.19**	-0.09	0.04	-0.01	0.05
	(-0.37)	(-1.71)	(0.52)	(-0.22)	(-0.50)	(1.30)	(3.12)	(2.19)	(-0.20)	(0.88)	(-0.12)	(0.15)
Year and industry FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Adj R-sq	0.06	0.06	0.11	0.06	0.06	0.06	0.07	0.07	-0.16	-0.00	-0.01	0.02
Nobs	1426	1277	149	1426	1277	149	1425	1276	149	1425	1276	149

Table 7: Bidder CAR [-2;+2] detailed

The table reports the estimation results for the linear regression for a bidder CAR around the announcement date. In each of the specifications, holdings of a specific group of HFs with a high value of a given characteristic are included as an additional factor ($HFhold(Factor_{high})$), as well as the product of those holdings with the bidder overvaluation ($HFhold(Factor_{high}) \cdot overval_b$). The characteristics include: I - HF average portfolio turnover ($turn$), II- HF portfolio Herfindahl index ($Herf$), III - average residual volatility of the stocks held by the HF ($ResVol$), IV - HF alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), V - alpha t-statistic ($tstat$), VI - natural logarithm of HF portfolio size ($logPortSize$), VII - holdings of HFs which follow Event Driven, Multi-Strategy, and Relative Value Arbitrage styles ($EvDrHold$). *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in brackets.

	(1)	(2)	(3)	(4)	(5)	(6)
	$turn$	$Herf$	$ResVol$	$Alpha$	$logPortSize$	$EvDrHold$
fcf_t	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-1.06)	(-1.07)	(-1.08)	(-1.10)	(-1.09)	(-1.18)
fcf_a	0.02	0.02	0.02	0.02	0.02	0.02
	(0.90)	(0.87)	(0.85)	(0.87)	(0.84)	(0.84)
bm_t	0.00	0.00	0.00	0.00	0.00	0.00
	(0.31)	(0.40)	(0.35)	(0.38)	(0.42)	(0.36)
cap_t	0.00	0.00	0.00	0.00	0.00	0.00
	(0.67)	(0.56)	(0.67)	(0.62)	(0.36)	(0.61)
$bharvw_a$	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***
	(-5.43)	(-5.30)	(-5.33)	(-5.37)	(-5.35)	(-5.34)
roa_t	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-1.49)	(-1.47)	(-1.49)	(-1.49)	(-1.47)	(-1.37)
$hhsalesic3_a$	0.01	0.01	0.01	0.01	0.01	0.01
	(0.44)	(0.42)	(0.43)	(0.52)	(0.49)	(0.49)
$lm12_a$	0.00	0.00	0.00	0.00	0.00	0.00*
	(1.63)	(1.57)	(1.62)	(1.62)	(1.52)	(1.71)
$phda$	0.00	0.00	0.00	0.00	0.00	0.00
	(0.35)	(0.37)	(0.30)	(0.34)	(0.34)	(0.31)
$overval_t$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(-0.45)	(-0.38)	(-0.45)	(-0.35)	(-0.16)	(-0.31)
$overval_a$	0.00	0.00	0.00	0.00	0.00	0.00
	(0.90)	(0.89)	(0.86)	(0.87)	(0.87)	(0.83)
$insthold$	0.01	0.00	0.00	0.00	-0.00	0.00
	(0.36)	(0.07)	(0.21)	(0.23)	(-0.06)	(0.11)
$insthold > 0$	0.00	0.00	0.00	0.00	0.00	0.00
	(0.18)	(0.29)	(0.30)	(0.16)	(0.24)	(0.25)
$HFhold(Factor_{low}) > 0$	0.02*	0.00	0.01	0.02*	0.01*	0.01
	(1.89)	(0.23)	(1.24)	(1.86)	(1.77)	(0.73)
$HFhold(Factor_{high}) > 0$	-0.01	0.01	-0.00	-0.00	0.01	0.00
	(-1.13)	(1.17)	(-0.29)	(-0.50)	(0.96)	(0.48)
$HFhold(Factor_{low})$	-0.02	0.02	-0.03	-0.01	-0.15	0.01
	(-0.37)	(0.32)	(-0.71)	(-0.17)	(-1.27)	(0.32)
$HFhold(Factor_{high})$	-0.01	-0.09	-0.01	-0.06	-0.03	-0.20*
	(-0.19)	(-1.43)	(-0.11)	(-0.93)	(-0.94)	(-1.68)
Constant	-0.01	-0.01	-0.04	-0.01	-0.04	-0.01
	(-0.34)	(-0.35)	(-1.31)	(-0.37)	(-1.43)	(-0.37)
Year and industry FE	yes	yes	yes	yes	yes	yes
Adj. R-sq	0.06	0.06	0.06	0.06	0.06	0.06
Nobs	1426	1426	1426	1426	1426	1426

Table 8: Target CAR [-2;+2] detailed

The table reports the estimation results for the linear regression for a target CAR around the announcement date. In each of the specifications, holdings of a specific group of HFs with a high value of a given characteristic are included as an additional factor ($HFhold(Factor_{high})$), as well as the product of those holdings with the bidder overvaluation ($HFhold(Factor_{high}) \cdot overval_b$). The characteristics include: I - HF average portfolio turnover ($turn$), II- HF portfolio Herfindahl index ($Herf$), III - average residual volatility of the stocks held by the HF ($ResVol$), IV - HF alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), V - alpha t-statistic ($tstat$), VI - natural logarithm of HF portfolio size ($logPortSize$), VII - holdings of HFs which follow Event Driven, Multi-Strategy, and Relative Value Arbitrage styles ($EvDrHold$). *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in brackets.

	(1)	(2)	(3)	(4)	(5)	(6)
	$turn$	$Herf$	$ResVol$	$Alpha$	$logPortSize$	$EvDrHold$
fcf_t	-0.03	-0.02	-0.03	-0.03	-0.02	-0.03
	(-0.38)	(-0.28)	(-0.36)	(-0.40)	(-0.34)	(-0.40)
fcf_a	0.14**	0.14**	0.14**	0.14**	0.14**	0.14**
	(2.40)	(2.48)	(2.41)	(2.41)	(2.41)	(2.42)
bm_t	-0.02*	-0.02*	-0.02*	-0.02*	-0.02*	-0.02*
	(-1.73)	(-1.65)	(-1.73)	(-1.71)	(-1.83)	(-1.75)
cap_t	0.00	0.00	0.00	0.00	0.00	0.00
	(0.07)	(0.08)	(0.03)	(0.05)	(0.14)	(0.02)
$bharvw_a$	0.00	0.00	0.00	0.00	0.00	0.00
	(0.18)	(0.22)	(0.17)	(0.17)	(0.19)	(0.20)
roa_t	-0.00	-0.01	-0.00	-0.00	-0.01	-0.00
	(-0.01)	(-0.11)	(-0.04)	(-0.01)	(-0.10)	(-0.01)
$hhsalesic3_a$	0.04	0.05	0.05	0.05	0.04	0.05
	(0.70)	(0.73)	(0.74)	(0.77)	(0.70)	(0.73)
$lm12_a$	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
	(-2.64)	(-2.72)	(-2.59)	(-2.61)	(-2.59)	(-2.59)
$phda$	-0.00**	-0.00*	-0.00**	-0.00**	-0.00**	-0.00**
	(-2.04)	(-1.91)	(-2.02)	(-2.02)	(-2.05)	(-2.05)
$overval_t$	0.00	0.00	0.00	0.00	0.00	0.00
	(0.59)	(0.57)	(0.62)	(0.54)	(0.48)	(0.67)
$overval_a$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(-0.23)	(-0.06)	(-0.28)	(-0.16)	(-0.28)	(-0.26)
$insthold$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-0.67)	(-0.76)	(-0.79)	(-0.70)	(-0.71)	(-0.81)
$insthold > 0$	0.05	0.04	0.05	0.05	0.05	0.05
	(1.11)	(1.02)	(1.22)	(1.10)	(1.24)	(1.17)
$HFhold(Factor_{low}) > 0$	-0.02	-0.01	-0.04*	-0.02	-0.02	-0.03
	(-0.91)	(-0.75)	(-1.72)	(-0.81)	(-1.16)	(-1.11)
$HFhold(Factor_{high}) > 0$	-0.01	-0.01	0.01	-0.02	-0.03	0.00
	(-0.53)	(-0.74)	(0.36)	(-0.90)	(-1.39)	(0.11)
$HFhold(Factor_{low})$	0.11	0.35***	0.09	0.17	0.04	0.13
	(0.96)	(2.80)	(0.71)	(1.48)	(0.15)	(1.13)
$HFhold(Factor_{high})$	0.15	-0.19	0.14	0.06	0.17*	0.03
	(0.86)	(-1.26)	(1.03)	(0.36)	(1.81)	(0.11)
Constant	0.23***	0.23***	0.16**	0.23***	0.17**	0.23***
	(3.14)	(3.20)	(2.11)	(3.15)	(2.19)	(3.12)
Year and industry FE	yes	yes	yes	yes	yes	yes
Adj. R-sq	0.07	0.07	0.07	0.07	0.07	0.07
Nobs	1425	1425	1425	1425	1425	1425

5.3 Deal completion probability

In a univariate setting, HF holdings are not statistically significantly related to the deal completion probability. The multivariate estimation results of a logit model for deal completion probability as a function of overall hedge fund holdings are reported in Table 9.

In the regression, the dummy variable for positive HF holdings significantly increases the completion probability. The corresponding coefficient of +0.92 is significant at the 1% level. This dummy, however, is likely to capture the selection of successful targets by HFs, rather then the impact of HF holdings on the deal completion probability. The effect of percentage HF holdings is not significant in the regression. The result does not change if we include as additional control a dummy for HF holdings in access of 5%, relative bidder overvaluation ($reloverval_a = overval_a/oerval_t$), or the product of the relative bidder overvaluation and HF holdings.

We next include holdings of HFs with high and low values of different characteristics in turn. The estimation results are reported in Table 10. Holdings by funds with longer investment horizon decrease the completion probability on average. The corresponding loading of -2.69 is significant at the 10% level. The most significant impact is associated with HFs with historically low alpha. Holdings by those funds significantly decrease completion probability, with the loading of -3.67 significant at the 5% level. This result, however, again can be capturing the stock picking skill of HF managers. Less skillful funds pick deals with lower completion probabilities, whereas the holdings of more skillful funds do not have any material change on the probability of completion.

Among other control variables, target book to market value is negatively related to the completion probability, whereas target collateral and percentage of stock offered are positively related to the completion probability, consistent with prior research on M&A.

Table 9: Probability of deal completion

The table reports the estimation results of the logit model for the probability of a deal completion. The dependent variable takes the value of one for completed deals and zero for those that are withdrawn. $HFhold > 0$ and $insthold > 0$ are dummy variables taking a value of one is there are non-zero holdings of HFs and other institutional investors in the target respectively. *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in parenthesis.

	Coeff.	Marg.	Coeff.	Marg.	Coeff.	Marg.	Coeff.	Marg.
roa_t	0.24	0.02	0.22	0.02	0.25	0.02	0.25	0.02
	(0.50)	(0.50)	(0.46)	(0.46)	(0.51)	(0.51)	(0.51)	(0.51)
bm_t	-0.49***	-0.04***	-0.49***	-0.04***	-0.49***	-0.04***	-0.49***	-0.04***
	(-4.52)	(-4.58)	(-4.53)	(-4.59)	(-4.52)	(-4.59)	(-4.53)	(-4.59)
$saleg_t$	0.24	0.02	0.24	0.02	0.23	0.02	0.22	0.02
	(1.10)	(1.10)	(1.12)	(1.12)	(1.07)	(1.07)	(1.01)	(1.01)
$levmkt_t$	-1.19	-0.11	-1.19	-0.11	-1.18	-0.11	-1.13	-0.10
	(-1.62)	(-1.62)	(-1.62)	(-1.62)	(-1.61)	(-1.61)	(-1.54)	(-1.54)
$collateral_t$	1.55**	0.14**	1.56**	0.14**	1.55**	0.14**	1.54**	0.14**
	(2.23)	(2.23)	(2.23)	(2.23)	(2.22)	(2.23)	(2.20)	(2.21)
pe_t	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(-0.19)	(-0.19)	(-0.18)	(-0.18)	(-0.20)	(-0.20)	(-0.22)	(-0.22)
$divyield_t$	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00
	(0.57)	(0.57)	(0.59)	(0.59)	(0.57)	(0.57)	(0.57)	(0.57)
$tend$	0.73**	0.07**	0.73**	0.07**	0.73**	0.07**	0.73**	0.07**
	(2.49)	(2.50)	(2.49)	(2.50)	(2.49)	(2.49)	(2.50)	(2.50)
$valpct$	-0.81***	-0.07***	-0.81***	-0.07***	-0.80***	-0.07***	-0.80***	-0.07***
	(-6.92)	(-7.27)	(-6.93)	(-7.28)	(-6.91)	(-7.26)	(-6.90)	(-7.24)
$phda$	-0.02*	-0.00*	-0.02*	-0.00*	-0.02*	-0.00*	-0.02	-0.00
	(-1.67)	(-1.68)	(-1.67)	(-1.68)	(-1.67)	(-1.68)	(-1.60)	(-1.60)
$pctstock$	0.01***	0.00***	0.01***	0.00***	0.01***	0.00***	0.01***	0.00***
	(2.63)	(2.64)	(2.64)	(2.65)	(2.62)	(2.63)	(2.64)	(2.65)
$overval_t$	-0.01	-0.00	-0.01	-0.00	-0.01	-0.00	-0.01	-0.00
	(-0.53)	(-0.53)	(-0.56)	(-0.56)	(-0.47)	(-0.47)	(-0.50)	(-0.50)
$overval_a$	-0.01	-0.00	-0.01	-0.00	-0.01	-0.00	-0.01	-0.00
	(-1.22)	(-1.22)	(-1.19)	(-1.19)	(-1.24)	(-1.24)	(-1.13)	(-1.13)
$insthold$	-0.26	-0.02	-0.19	-0.02	-0.26	-0.02	-0.26	-0.02
	(-0.46)	(-0.46)	(-0.34)	(-0.34)	(-0.46)	(-0.46)	(-0.47)	(-0.47)
$insthold > 0$	0.06	0.01	0.05	0.00	0.05	0.00	0.05	0.00
	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
$HFhold > 0$	0.92***	0.08***	1.00***	0.09***	0.93***	0.08***	0.93***	0.08***
	(3.33)	(3.35)	(3.40)	(3.43)	(3.34)	(3.36)	(3.34)	(3.36)
$HFhold$	-1.71	-0.16	-0.98	-0.09	-1.70	-0.16	-1.55	-0.14
	(-1.43)	(-1.43)	(-0.65)	(-0.65)	(-1.42)	(-1.42)	(-1.26)	(-1.26)
$HFhold > 5\%$			-0.26	-0.02				
			(-0.83)	(-0.83)				
$reloverval_a$					0.00	0.00	0.00	0.00
					(0.21)	(0.21)	(0.52)	(0.52)
$HFhold \cdot reloverval_a$							-0.05	-0.00
							(-0.69)	(-0.69)
Constant	1.99**		1.98**		1.99**		1.98**	
	(2.03)		(2.02)		(2.03)		(2.01)	
Year and industry FE	yes		yes		yes		yes	
Pseudo R-sq	0.21		0.21		0.21		0.21	
Chi-sq stat	236.19		236.87		236.24		236.70	
Chi-sq p-val	0.00		0.00		0.00		0.00	
Nobs	1434.00	1434.00	1434.00	1434.00	1434.00	1434.00	1434.00	1434.00

Table 10: Probability of deal completion: detailed

The table reports the estimation results for the logit model for deal completion probability. In each of the specifications, holdings of HFs with a high and low values of a given characteristic are included ($HFhold(Factor_{high})$ and $HFhold(Factor_{low})$): (I) - HF average portfolio turnover ($turn$), (II)- HF portfolio Herfindahl index ($Herf$), (III) - average residual volatility of the stocks held by the HF ($ResVol$), (IV) - HF alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), (V) - natural logarithm of HF portfolio size ($logPortSize$), (VI) - holdings of HFs which follow Event Driven, Multi-Strategy, and Relative Value Arbitrage styles ($EvDrHold$). *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)
	$turn$	$Herf$	$ResVol$	$Alpha$	$logPortSize$	$EvDrHold$
roa_t	0.27	0.26	0.27	0.23	0.24	0.23
	(0.56)	(0.54)	(0.56)	(0.48)	(0.50)	(0.48)
bm_t	-0.48***	-0.47***	-0.49***	-0.49***	-0.47***	-0.51***
	(-4.42)	(-4.35)	(-4.51)	(-4.50)	(-4.30)	(-4.63)
$saleg_t$	0.23	0.25	0.23	0.24	0.24	0.24
	(1.05)	(1.13)	(1.07)	(1.11)	(1.11)	(1.08)
$levmkt_t$	-1.15	-1.22*	-1.23*	-1.11	-1.19	-1.19
	(-1.56)	(-1.66)	(-1.68)	(-1.50)	(-1.63)	(-1.63)
$collateral_t$	1.53**	1.59**	1.55**	1.51**	1.60**	1.53**
	(2.18)	(2.28)	(2.22)	(2.15)	(2.29)	(2.19)
pe_t	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(-0.18)	(-0.17)	(-0.30)	(-0.19)	(-0.15)	(-0.27)
$divyield_t$	0.04	0.05	0.05	0.05	0.05	0.04
	(0.57)	(0.63)	(0.62)	(0.61)	(0.65)	(0.58)
$tend$	0.74**	0.73**	0.74**	0.73**	0.74**	0.74**
	(2.50)	(2.49)	(2.52)	(2.48)	(2.53)	(2.50)
$valpct$	-0.80***	-0.82***	-0.82***	-0.83***	-0.83***	-0.80***
	(-6.91)	(-7.14)	(-6.97)	(-7.08)	(-7.13)	(-6.83)
$phda$	-0.02*	-0.02	-0.02*	-0.02*	-0.02	-0.02*
	(-1.67)	(-1.62)	(-1.71)	(-1.81)	(-1.62)	(-1.67)
$pctstock$	0.01**	0.01***	0.01***	0.01***	0.01***	0.01**
	(2.53)	(2.65)	(2.65)	(2.70)	(2.58)	(2.55)
$overval_t$	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-0.54)	(-0.62)	(-0.49)	(-0.48)	(-0.61)	(-0.60)
$overval_a$	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-1.24)	(-1.22)	(-1.22)	(-1.40)	(-1.18)	(-1.20)
$insthold$	-0.30	-0.45	-0.35	-0.35	-0.47	-0.18
	(-0.53)	(-0.80)	(-0.62)	(-0.61)	(-0.82)	(-0.32)
$insthold > 0$	0.11	0.26	0.13	0.21	0.24	0.02
	(0.20)	(0.47)	(0.24)	(0.38)	(0.44)	(0.03)
$HFhold(Factor_{low}) > 0$	0.81***	0.30	0.91***	0.75***	0.26	1.25***
	(2.90)	(1.15)	(3.26)	(2.69)	(0.99)	(3.26)
$HFhold(Factor_{high}) > 0$	0.03	0.45	-0.09	0.14	0.52*	-0.36
	(0.13)	(1.63)	(-0.32)	(0.54)	(1.85)	(-1.02)
$HFhold(Factor_{low})$	-2.69*	-1.74	-0.71	-3.67**	-2.65	-2.09
	(-1.80)	(-1.03)	(-0.42)	(-2.34)	(-0.52)	(-1.28)
$HFhold(Factor_{high})$	1.04	-1.29	-2.63	2.12	-1.37	0.52
	(0.38)	(-0.55)	(-1.35)	(0.85)	(-1.05)	(0.12)
Constant	2.04**	2.03**	2.08**	2.15**	1.96**	2.08**
	(2.07)	(2.05)	(2.10)	(2.18)	(1.99)	(2.10)
Year and industry FE	yes	yes	yes	yes	yes	yes
Pseudo R-sq	0.21	0.21	0.21	0.21	0.21	0.21
Chi-sq stat	236.39	230.94	237.47	238.49	230.70	238.90
Chi-sq p-val	0.00	0.00	0.00	0.00	0.00	0.00
Nobs	1434.00	1434.00	1434.00	1434.00	1434.00	1434.00

5.4 Tender offer probability

In a univariate setting, HF holdings are positively related to the probability of a tender offer. The estimation results of a corresponding logit model in Table 11 corroborate this conclusion. HF holdings are positively related to the probability of a tender offer with the corresponding loading of +2.66 being highly significant. The magnitude of the loading on the HF holdings is higher than that on other institutional holdings. However, the difference is not statistically significant, suggesting that HFs not not increase the probability of a tender offer by more than other institutional investors do.

We next include holdings of HFs with high and low values of different characteristics in turn, similar to the previous analysis and report the estimation results in Table 12. All the loadings on holdings of HFs of different types are always positive and similar in magnitudes. We cannot reject the hypothesis of the equality of the loadings across HFs with different values of characteristics in question. This indicates, that in terms of the impact of their holdings on the probability of a tender offer, all HFs are relatively homogenous. At the same time, the other institutional investors still have positive and highly significant impact on the probability of a tender offer, which is not statistically different from the one HFs have.

Table 11: Probability of a tender offer

The table reports the estimation results of the logit model for the probability of a tender offer. The dependent variable takes the value of one for tender offer deals and zero otherwise. $HFhold > 0$ and $insthold > 0$ are dummy variables taking a value of one is there are non-zero holdings of HFs and other institutional investors in the target respectively. *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in parenthesis.

	Coeff.	Marg.	Coeff.	Marg.
roa_t	0.08	0.01	0.09	0.01
	(0.22)	(0.22)	(0.24)	(0.24)
bm_t	0.07	0.01	0.07	0.01
	(0.66)	(0.66)	(0.67)	(0.67)
$saleg_t$	0.27*	0.04*	0.27*	0.04*
	(1.85)	(1.85)	(1.84)	(1.85)
$levmkt_t$	-0.74	-0.10	-0.74	-0.10
	(-1.19)	(-1.19)	(-1.20)	(-1.20)
$collateral_t$	-0.37	-0.05	-0.38	-0.05
	(-0.72)	(-0.72)	(-0.73)	(-0.73)
pe_t	-0.00	-0.00	-0.00	-0.00
	(-1.61)	(-1.61)	(-1.61)	(-1.62)
$divyield_t$	0.05	0.01	0.05	0.01
	(1.27)	(1.27)	(1.26)	(1.26)
$valpct$	-0.06	-0.01	-0.06	-0.01
	(-0.53)	(-0.53)	(-0.52)	(-0.52)
$phda$	0.00	0.00	0.00	0.00
	(0.10)	(0.10)	(0.10)	(0.10)
$overval_t$	0.01	0.00	0.01	0.00
	(1.13)	(1.13)	(1.15)	(1.15)
$overval_a$	-0.02	-0.00	-0.02	-0.00
	(-1.57)	(-1.58)	(-1.59)	(-1.59)
$insthold$	2.00***	0.27***	1.96***	0.27***
	(4.62)	(4.70)	(4.49)	(4.56)
$insthold > 0$	0.69	0.09	0.70	0.09
	(1.02)	(1.02)	(1.03)	(1.03)
$HFhold > 0$	0.17	0.02	0.14	0.02
	(0.68)	(0.68)	(0.53)	(0.53)
$HFhold$	2.66***	0.36***	2.30**	0.31**
	(2.84)	(2.86)	(2.00)	(2.00)
$HFhold > 5\%$			0.12	0.02
			(0.53)	(0.53)
Constant	-2.95***		-2.95***	
	(-3.29)		(-3.29)	
Year and industry FE	yes		yes	
Pseudo R-sq	0.15		0.15	
Chi-sq stat	236.61		236.90	
Chi-sq p-val	0.00		0.00	
Nobs	1543.00	1543.00	1543.00	1543.00

Table 12: Probability of a tender offer: detailed

The table reports the estimation results for the logit model for probability of a tender offer. In each of the specifications, holdings of HFs with a high and low values of a given characteristic are included ($HFhold(Factor_{high})$ and $HFhold(Factor_{low})$): (I) - HF average portfolio turnover ($turn$), (II)- HF portfolio Herfindahl index ($Herf$), (III) - average residual volatility of the stocks held by the HF ($ResVol$), (IV) - HF alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), (V) - natural logarithm of HF portfolio size ($logPortSize$), (VI) - holdings of HFs which follow Event Driven, Multi-Strategy, and Relative Value Arbitrage styles ($EvDrHold$). *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)
	$turn$	$Herf$	$ResVol$	$Alpha$	$logPortSize$	$EvDrHold$
roa_t	0.07	0.10	0.08	0.10	0.06	0.08
	(0.19)	(0.26)	(0.21)	(0.28)	(0.16)	(0.23)
bm_t	0.07	0.07	0.07	0.06	0.05	0.09
	(0.64)	(0.72)	(0.70)	(0.61)	(0.49)	(0.90)
$saleg_t$	0.27*	0.28*	0.28*	0.28*	0.28*	0.28*
	(1.83)	(1.86)	(1.88)	(1.90)	(1.89)	(1.89)
$levmkt_t$	-0.74	-0.74	-0.74	-0.71	-0.74	-0.72
	(-1.19)	(-1.19)	(-1.20)	(-1.15)	(-1.19)	(-1.16)
$collateral_t$	-0.37	-0.39	-0.35	-0.39	-0.38	-0.34
	(-0.71)	(-0.74)	(-0.68)	(-0.75)	(-0.74)	(-0.65)
pe_t	-0.00*	-0.00*	-0.00	-0.00	-0.00	-0.00
	(-1.65)	(-1.69)	(-1.61)	(-1.63)	(-1.59)	(-1.54)
$divyield_t$	0.05	0.05	0.05	0.05	0.05	0.05
	(1.27)	(1.24)	(1.24)	(1.26)	(1.29)	(1.16)
$valpct$	-0.06	-0.06	-0.07	-0.05	-0.04	-0.08
	(-0.58)	(-0.53)	(-0.63)	(-0.50)	(-0.38)	(-0.70)
$phda$	0.00	0.00	0.00	0.00	0.00	0.00
	(0.11)	(0.17)	(0.12)	(0.04)	(0.07)	(0.08)
$overval_t$	0.02	0.02	0.02	0.02	0.01	0.02
	(1.24)	(1.35)	(1.21)	(1.34)	(1.03)	(1.29)
$overval_a$	-0.02	-0.02	-0.02	-0.02*	-0.02	-0.02*
	(-1.61)	(-1.59)	(-1.64)	(-1.66)	(-1.58)	(-1.69)
$insthold$	1.94***	1.92***	1.90***	2.05***	2.11***	1.87***
	(4.46)	(4.43)	(4.36)	(4.69)	(4.84)	(4.29)
$insthold > 0$	0.66	0.58	0.71	0.60	0.62	0.75
	(0.99)	(0.86)	(1.06)	(0.90)	(0.93)	(1.11)
$HFhold(Factor_{low}) > 0$	0.14	0.21	0.02	0.48*	-0.38*	-0.40
	(0.55)	(0.96)	(0.08)	(1.89)	(-1.95)	(-1.18)
$HFhold(Factor_{high}) > 0$	0.16	0.27	0.25	-0.08	0.36	0.69**
	(0.76)	(1.12)	(1.18)	(-0.41)	(1.42)	(2.38)
$HFhold(Factor_{low})$	2.72**	2.97**	2.87**	1.70	5.88*	2.28*
	(2.25)	(2.25)	(2.12)	(1.34)	(1.81)	(1.79)
$HFhold(Factor_{high})$	1.67	0.86	1.85	3.63**	2.94***	2.05
	(0.87)	(0.48)	(1.26)	(2.06)	(2.88)	(0.64)
Constant	-2.98***	-3.11***	-2.98***	-2.99***	-2.88***	-3.08***
	(-3.32)	(-3.44)	(-3.32)	(-3.33)	(-3.20)	(-3.42)
Year and industry FE	yes	yes	yes	yes	yes	yes
Pseudo R-sq	0.15	0.15	0.15	0.15	0.15	0.16
Chi-sq stat	237.59	240.03	237.91	240.42	241.20	242.51
Chi-sq p-val	0.00	0.00	0.00	0.00	0.00	0.00
Nobs	1543.00	1543.00	1543.00	1543.00	1543.00	1543.00

5.5 Deal duration

As far as deal duration is concerned (Table 13), we document a very strong negative negative impact of HF holdings associated with all stock deals. One percentage point increase in HF holdings shortens negotiations of all stock deals by 1.19 days. The statistical support is even stronger for completed deals and is the coefficient is not significant for withdrawn deals.

As for the other control variables, target's ROA and collateral reduce deal duration. The duration is also significantly shorter for tender offers.

We now turn our attention to different groups of HFs, and include holdings of HFs with short investment horizon, as well as concentrated portfolios, high idiosyncratic risk of stocks held, better skill, larger size, and event-driven styles. The estimation results are reported in Table 14.

The impact on deal duration is largely associated with HFs with short investment horizon. The holdings on shorttermist HFs have the loading of -160.73 significant at the 1% level. The loading on HF holdings with low turnover is insignificant. Increasing the holdings of shorttermist HFs by 1% leads to shortening of the negotiation process by around 1.6 days. The impact of shorttermists HFs is even more pronounced for all stock deals. Here, increasing holdings by 1% leads to decrease in duration by almost 3 days. Funds investing in in stocks with high idiosyncratic risk also significantly shorten deal duration, and the impact is associated not only with all stock deals, although it becomes stronger for all stock deals. Holdings of funds investing in more market driven stocks, to the contrary, lead to increased deal duration. The interaction term between HF holdings and all-stock dummy is also negative and highly significant for larger funds and fund following event driven styles, indicating that such HFs are more likely to make a difference in facilitating the deal in the all-stock scenario.

Table 13: Deal duration

The table reports the estimation results for the liner regression for deal duration. $HFhold > 0$ and $insthold > 0$ are dummy variables taking a value of one is there are non-zero holdings of HFs and other institutional investors in the target respectively. *AllStock* is a dummy variable taking a value of one for all stock deals. *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	Compl.	Withdr.	All	Compl.	Withdr.	All	Compl.	Withdr.
roa_t	-14.43	-21.34*	12.75	-14.07	-21.22*	18.66	-14.27	-21.53*	27.62
	(-1.28)	(-1.88)	(0.24)	(-1.25)	(-1.87)	(0.34)	(-1.27)	(-1.90)	(0.50)
bm_t	-0.84	1.78	-15.07	-0.61	2.10	-16.44	-1.11	1.51	-16.32
	(-0.27)	(0.54)	(-1.05)	(-0.20)	(0.64)	(-1.15)	(-0.36)	(0.46)	(-1.14)
$saleg_t$	-6.29	-9.94**	0.60	-6.15	-9.46*	2.55	-6.41	-9.99**	0.90
	(-1.26)	(-1.98)	(0.02)	(-1.24)	(-1.89)	(0.08)	(-1.29)	(-1.99)	(0.03)
$levmkt_t$	6.61	-6.53	79.37	7.05	-6.36	141.86	7.25	-6.63	115.67
	(0.36)	(-0.35)	(0.63)	(0.38)	(-0.34)	(1.04)	(0.39)	(-0.35)	(0.85)
$collateral_t$	-39.60**	-40.14***	-92.51	-38.27**	-38.69**	-126.84	-38.23**	-37.75**	-102.72
	(-2.54)	(-2.58)	(-0.78)	(-2.45)	(-2.49)	(-1.03)	(-2.45)	(-2.42)	(-0.85)
pe_t	-0.05	-0.04	-0.29	-0.05	-0.04	-0.28	-0.05	-0.04	-0.27
	(-1.20)	(-0.84)	(-1.23)	(-1.21)	(-0.87)	(-1.18)	(-1.18)	(-0.82)	(-1.14)
$divyield_t$	-1.57	-1.46	47.85	-1.50	-1.38	55.01*	-1.57	-1.49	47.04
	(-1.13)	(-1.07)	(1.51)	(-1.08)	(-1.01)	(1.72)	(-1.13)	(-1.09)	(1.48)
$tend$	-61.75***	-69.65***	-42.97	-54.99***	-61.74***	-50.72	-63.43***	-70.87***	-48.32
	(-10.23)	(-11.47)	(-1.19)	(-8.04)	(-8.86)	(-1.40)	(-9.93)	(-10.98)	(-1.34)
$valpct$	7.83**	22.73***	-19.28	7.80**	22.33***	-20.14	7.85**	22.81***	-21.72
	(2.25)	(5.54)	(-1.51)	(2.24)	(5.43)	(-1.52)	(2.26)	(5.56)	(-1.66)
$phda$	0.02	0.18	-2.82	0.06	0.21	-2.86	0.02	0.21	-2.96
	(0.04)	(0.46)	(-1.19)	(0.16)	(0.54)	(-1.19)	(0.05)	(0.52)	(-1.23)
$overval_t$	0.13	-0.03	2.98	0.15	-0.01	3.26	0.12	-0.06	3.53
	(0.35)	(-0.09)	(1.41)	(0.39)	(-0.02)	(1.51)	(0.33)	(-0.15)	(1.65)
$overval_a$	-0.32	-0.25	0.75	-0.34	-0.28	0.58	-0.26	-0.18	0.53
	(-1.21)	(-0.91)	(0.53)	(-1.27)	(-1.02)	(0.41)	(-0.98)	(-0.66)	(0.37)
$insthold$	-5.88	-0.54	-43.79	-22.46	-11.80	-80.72	-18.47	-11.88	-70.78
	(-0.44)	(-0.04)	(-0.66)	(-1.20)	(-0.62)	(-0.77)	(-1.15)	(-0.73)	(-0.77)
$insthold > 0$	1.22	-1.17	-26.60	-0.41	-2.90	-58.46	-0.20	-0.98	-78.30
	(0.08)	(-0.08)	(-0.33)	(-0.03)	(-0.20)	(-0.65)	(-0.01)	(-0.07)	(-0.87)
$HFhold > 0$	5.72	-1.68	-45.37	5.60	-1.78	-35.91	6.39	-1.35	-38.56
	(0.79)	(-0.22)	(-1.15)	(0.77)	(-0.24)	(-0.87)	(0.89)	(-0.18)	(-0.98)
$HFhold$	-39.85	-46.18	174.20	-7.20	-10.36	162.21	-2.99	-1.54	225.97
	(-1.40)	(-1.60)	(1.14)	(-0.19)	(-0.27)	(0.74)	(-0.09)	(-0.05)	(1.27)
$pctstock$				0.08	0.13	-0.68			
				(0.97)	(1.51)	(-1.11)			
$insthold \cdot pctstock$				0.35	0.26	0.47			
				(1.34)	(0.97)	(0.31)			
$HFhold \cdot pctstock$				-0.67	-0.74	-0.27			
				(-1.24)	(-1.31)	(-0.09)			
$AllStock$							-4.38	-0.69	-58.63
							(-0.57)	(-0.09)	(-1.04)
$insthold \cdot AllStock$							37.46	37.16	58.24
							(1.53)	(1.46)	(0.41)
$HFhold \cdot AllStock$							-118.75**	-147.49***	-176.66
							(-2.25)	(-2.69)	(-0.63)
Constant	150.22***	187.28***	274.13	127.62***	134.19***	218.06	134.60***	141.90***	214.83
	(5.65)	(7.30)	(1.38)	(5.08)	(5.34)	(1.11)	(5.43)	(5.72)	(1.13)
Year and industry FE	yes	yes	yes	yes	yes	yes	yes	yes	yes
Adj R-sq	0.07	0.10	0.00	0.07	0.11	0.01	0.07	0.11	0.02
Nobs	1829	1635	194	1829	1635	194	1829	1635	194

Table 14: Deal duration detailed

The table reports the estimation results for the liner regression for deal duration. In each of the specifications, holdings of HFs with a high and low values of a given characteristic are included ($HFhold(Factor_{high})$ and $HFhold(Factor_{low})$): (I) - HF average portfolio turnover ($turn$), (II)- HF portfolio Herfindahl index ($Herf$), (III) - average residual volatility of the stocks held by the HF ($ResVol$), (IV) - HF alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), (V) - natural logarithm of HF portfolio size ($logPortSize$), (VI) - holdings of HFs which follow Event Driven, Multi-Strategy, and Relative Value Arbitrage styles ($EvDrHold$). *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	turn	*turn*	*Herf*	*Herf*	*ResVol*	*ResVol*	*Alpha*	*Alpha*	*logPortSize*	*logPortSize*	*EvDrHold*	*EvDrHold*
roa_t	-15.32	-15.48	-13.80	-13.67	-14.48	-14.34	-14.12	-13.83	-14.61	-14.67	-14.70	-13.72
	(-1.36)	(-1.38)	(-1.22)	(-1.21)	(-1.30)	(-1.28)	(-1.25)	(-1.23)	(-1.30)	(-1.30)	(-1.30)	(-1.22)
bm_t	-1.16	-1.40	-1.12	-1.40	-1.39	-1.63	-0.83	-1.16	-0.46	-0.70	-0.92	-1.27
	(-0.38)	(-0.45)	(-0.36)	(-0.45)	(-0.45)	(-0.53)	(-0.27)	(-0.38)	(-0.15)	(-0.23)	(-0.30)	(-0.41)
$saleg_t$	-5.97	-6.28	-6.13	-6.26	-5.69	-5.93	-6.29	-6.40	-6.40	-6.58	-6.38	-6.50
	(-1.20)	(-1.26)	(-1.23)	(-1.26)	(-1.15)	(-1.20)	(-1.26)	(-1.29)	(-1.28)	(-1.32)	(-1.28)	(-1.31)
$levmkt_t$	6.53	6.64	6.07	6.73	4.70	4.75	6.32	6.81	6.31	6.73	6.53	7.68
	(0.35)	(0.36)	(0.33)	(0.36)	(0.26)	(0.26)	(0.34)	(0.37)	(0.34)	(0.36)	(0.35)	(0.42)
$collateral_t$	-37.60**	-36.26**	-39.68**	-38.40**	-36.12**	-34.95**	-40.82***	-39.33**	-38.91**	-37.32**	-38.64**	-36.98**
	(-2.41)	(-2.32)	(-2.54)	(-2.46)	(-2.33)	(-2.25)	(-2.61)	(-2.51)	(-2.49)	(-2.39)	(-2.47)	(-2.36)
pe_t	-0.06	-0.05	-0.05	-0.05	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.05	-0.05
	(-1.24)	(-1.18)	(-1.16)	(-1.14)	(-1.35)	(-1.32)	(-1.29)	(-1.28)	(-1.23)	(-1.22)	(-1.19)	(-1.17)
$divyield_t$	-1.58	-1.61	-1.48	-1.47	-1.41	-1.43	-1.58	-1.53	-1.61	-1.63	-1.59	-1.55
	(-1.13)	(-1.16)	(-1.06)	(-1.06)	(-1.02)	(-1.03)	(-1.13)	(-1.10)	(-1.15)	(-1.17)	(-1.14)	(-1.12)
$tend$	-61.84***	-63.48***	-61.59***	-63.41***	-61.98***	-63.45***	-62.01***	-64.15***	-61.23***	-62.94***	-61.71***	-63.67***
	(-10.25)	(-9.96)	(-10.18)	(-9.90)	(-10.35)	(-10.00)	(-10.26)	(-10.02)	(-10.12)	(-9.83)	(-10.20)	(-9.96)
$valpct$	7.18**	7.33**	7.69**	7.64**	6.61*	6.69*	7.91**	7.93**	7.23**	7.16**	7.86**	7.80**
	(2.06)	(2.11)	(2.22)	(2.20)	(1.91)	(1.93)	(2.28)	(2.28)	(2.08)	(2.06)	(2.26)	(2.24)
$phda$	0.03	0.04	-0.01	-0.01	0.04	0.04	0.03	0.05	0.02	0.03	0.01	0.01
	(0.08)	(0.10)	(-0.02)	(-0.02)	(0.11)	(0.10)	(0.08)	(0.13)	(0.07)	(0.08)	(0.03)	(0.04)
$overval_t$	0.11	0.11	0.13	0.13	0.21	0.19	0.16	0.16	0.14	0.14	0.13	0.12
	(0.29)	(0.29)	(0.35)	(0.34)	(0.56)	(0.52)	(0.44)	(0.44)	(0.37)	(0.36)	(0.34)	(0.33)
$overval_a$	-0.30	-0.23	-0.34	-0.29	-0.26	-0.22	-0.32	-0.25	-0.32	-0.25	-0.32	-0.25
	(-1.13)	(-0.86)	(-1.28)	(-1.07)	(-0.99)	(-0.81)	(-1.20)	(-0.94)	(-1.19)	(-0.94)	(-1.20)	(-0.93)
$insthold$	-9.62	-20.26	-5.31	-18.19	-11.03	-23.46	-6.41	-19.62	-10.54	-23.99	-4.75	-16.52
	(-0.72)	(-1.25)	(-0.40)	(-1.13)	(-0.83)	(-1.46)	(-0.48)	(-1.22)	(-0.79)	(-1.47)	(-0.36)	(-1.03)
$insthold > 0$	1.03	-0.23	3.30	2.15	3.18	2.38	-0.51	-1.93	4.56	3.18	1.49	0.38
	(0.07)	(-0.02)	(0.23)	(0.15)	(0.22)	(0.17)	(-0.04)	(-0.14)	(0.32)	(0.22)	(0.10)	(0.03)
$HFhold(Factor_{low}) > 0$	3.07	3.72	-4.51	-4.08	3.93	4.40	10.33	10.56	7.41	8.29	6.91	7.26
	(0.42)	(0.51)	(-0.71)	(-0.64)	(0.55)	(0.62)	(1.43)	(1.46)	(1.24)	(1.38)	(0.76)	(0.79)
$HFhold(Factor_{high}) > 0$	1.07	1.82	7.03	7.27	0.99	0.80	-2.61	-1.90	-1.58	-1.21	-1.08	-0.71
	(0.17)	(0.29)	(1.02)	(1.06)	(0.16)	(0.13)	(-0.41)	(-0.30)	(-0.22)	(-0.17)	(-0.14)	(-0.09)
$HFhold(Factor_{low})$	21.64	26.71	-63.35	-23.49	113.33***	122.83***	-18.07	39.99	-164.11	-146.54	-63.86*	-50.17
	(0.58)	(0.62)	(-1.49)	(-0.48)	(2.76)	(2.59)	(-0.45)	(0.85)	(-1.53)	(-1.25)	(-1.67)	(-1.13)
$HFhold(Factor_{high})$	-160.73***	-65.20	4.80	37.01	-210.29***	-156.67***	-80.51	-75.53	-32.18	8.32	52.65	182.71
	(-2.78)	(-0.96)	(0.09)	(0.59)	(-4.67)	(-2.79)	(-1.54)	(-1.25)	(-1.03)	(0.23)	(0.53)	(1.53)
$AllStock$		-3.60		-4.75		-6.17		-4.81		-3.99		-4.71
		(-0.47)		(-0.61)		(-0.81)		(-0.63)		(-0.51)		(-0.61)
$insthold \cdot AllStock$		31.88		38.22		36.50		40.50		38.15		35.00
		(1.29)		(1.55)		(1.49)		(1.64)		(1.54)		(1.42)
$HFhold(Factor_{low}) \cdot AllStock$		-20.79		-138.73*		-43.85		-185.23**		-193.62		-47.59
		(-0.28)		(-1.70)		(-0.53)		(-2.33)		(-0.80)		(-0.63)
$HFhold(Factor_{high}) \cdot AllStock$		-298.39***		-93.18		-141.42*		-21.26		-122.32**		-400.98*
		(-2.65)		(-0.93)		(-1.67)		(-0.21)		(-2.16)		(-1.85)
Constant	204.12***	207.33***	149.36***	203.03***	148.03***	206.36***	200.21***	202.74***	151.85***	154.90***	199.32***	200.57***
	(8.08)	(8.12)	(5.61)	(7.94)	(5.61)	(8.13)	(7.93)	(7.94)	(5.71)	(5.79)	(7.88)	(7.84)
Year and industry FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Adj R-sq	0.07	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07
Nobs	1829	1829	1829	1829	1829	1829	1829	1829	1829	1829	1829	1829

5.6 Means of payment

Table 15 reports the estimation results for means of payment in M&A deals. Column I uses percentage of cash offered as the dependent variable, and column II reports the results for percentage of stock offered. All specifications include year and industry fixed effects. Both institutional and HF holdings increase percentage of cash, and decrease percentage of stock offered. At the same time, the magnitude of the impact of HF holdings is two to three times stronger as that of other institutions, and the difference in statistically significant.

Interestingly, HF seem to be more likely to accept overvalued bidder stock. The loadings on the product of HF holdings and bidder overvaluation are -0.06 and +0.03 for cash and stock offered respectively, significant at the 1 and 5% levels respectively. This finding is consistent with the predictions of the model of Shleifer and Vishny [2003]. Our results suggest, that HFs on average behave as short term investors and their interests are not necessarily aligned with those of long term investors. They are more likely to give up control of the firm and walk away with cash payment, or accept overvalued bidder stock. The latter allows them to immediately cash in by selling the stock on open the market, leaving other investors with lower share of a joint firm than they could have achieved otherwise, if the bidder stock had been fairly priced or the overvalued stock not accepted.

As for the other control variables, deals with higher value of target market cap tend to have less stock and and more cash offered. Target overvaluation and percentage held in the target by the bidder on the announcement day lead to lower amount of stocks offered.

We now again include HF holdings of specific groups of HFs into the regressions together with the interaction terms of bidder overvaluation and holdings of HFs with higher and lower than the median characteristic of interest. The estimation results are reported in Table 16 for percentage of cash, and Table 17 for percentage of stock offered.

We do not find any significant difference between the impact on means of payment of holdings by funds with short- and long-term investment horizon. Both these types of funds have similar preferences of cash towards stock. At the same time, funds with short term investment horizon are more like to accept overvalued stock, than those with longer term ivestment horizon.

Holdings of HFs with high alpha lead to further increase in the percentage of cash offered and decline in the percentage of stock offered. Interestingly, these are the low-alpha funds which are willing to accept overvalued bidder stock, and not the high-alpha funds.

HF portfolio size has a strong effect as well. Large funds are more welcoming towards stocks than their smaller peers. The overall impact of large funds onto means of payment is still inline with all funds, predicting higher likelihood of a more-cash-less-stock outcome of an M&A deal, but the impact is less strong than that of smaller funds. This result suggests that large HFs may have generally higher liquidity buffers and, thus, lower preference for immediate liquidity as compared to smaller funds. Large funds are also less opposed to overvalued stock compared to smaller funds.

Funds, that do not follow Event Driven styles have stronger preferences for cash vs stock than Event Driven funds. These are, however, Event Driven funds that are more inclined to accept overvalued bidder stock. This result implies that those funds are unlikely to hold the stocks for long after the merger completion and are willing to sell soon thereafter.

Table 15: Means of payment

The table reports the estimation results of a liner regression for means of payment. In column I the dependent variable is the percentage of cash offered, whereas in column II the dependent variable is percentage of stock offered. $HFhold > 0$ and $insthold > 0$ are dummy variables taking a value of one is there are non-zero holdings of HFs and other institutional investors in the target respectively. *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in brackets.

	(1)	(2)
	pctcash	*pctstock*
bm_t	0.01	-0.02
	(0.35)	(-1.24)
$saleg_t$	0.05	-0.03
	(1.64)	(-1.29)
cap_t	-0.02***	0.01***
	(-4.27)	(4.60)
$levmkt_t$	-0.05	0.03
	(-0.48)	(0.37)
$collateral_t$	-0.01	-0.05
	(-0.17)	(-0.66)
$valpct$	-0.01	0.03
	(-0.56)	(1.43)
$phda$	0.00	-0.00*
	(1.38)	(-1.96)
$overval_t$	0.00	-0.00*
	(1.36)	(-1.79)
$overval_a$	-0.00	0.00
	(-1.51)	(1.17)
$insthold$	0.18**	-0.21***
	(2.20)	(-2.92)
$insthold > 0$	-0.08	0.08
	(-0.94)	(1.07)
$HFhold > 0$	-0.01	0.02
	(-0.15)	(0.52)
$HFhold$	0.52***	-0.59***
	(3.11)	(-3.78)
$HFhold \cdot overval_a$	-0.06***	0.03**
	(-3.27)	(2.21)
$insthold \cdot overval_a$	0.01	-0.00
	(1.18)	(-0.05)
Constant	0.09	0.36***
	(0.66)	(2.88)
sigma		
Constant	0.45***	0.41***
	(39.07)	(42.77)
Year and industry FE	yes	yes
Pseudo R-sq	0.20	0.19
Nobs	1829	1829

Table 16: Means of payment: cash detailed

The table reports the estimation results of a liner regression for the percentage of cash offered as payment. In each of the specifications, holdings of a specific group of HFs with a high value of a given characteristic are included as an additional factor ($HFhold(Factor_{high})$). The characteristics include: I - HF average portfolio turnover ($turn$), II- HF portfolio Herfindahl index ($Herf$), III - average residual volatility of the stocks held by the HF ($ResVol$), IV - HF alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), V - alpha t-statistic ($tstat$), VI - natural logarithm of HF portfolio size ($logPortSize$), VII - holdings of HFs which follow Event Driven, Multi-Strategy, and Relative Value Arbitrage styles ($EvDrHold$). *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in brackets.

	(1)	(2)	(3)	(4)	(5)	(6)
	$turn$	$Herf$	$ResVol$	$Alpha$	$logPortSize$	$EvDrHold$
bm_t	0.01	0.01	0.01	0.01	0.01	0.01
	(0.38)	(0.37)	(0.29)	(0.33)	(0.30)	(0.36)
$saleg_t$	0.05*	0.05	0.05*	0.05*	0.05*	0.05*
	(1.69)	(1.63)	(1.65)	(1.70)	(1.74)	(1.77)
cap_t	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***
	(-4.24)	(-4.25)	(-4.32)	(-4.25)	(-3.94)	(-4.28)
$levmkt_t$	-0.05	-0.05	-0.05	-0.05	-0.04	-0.04
	(-0.48)	(-0.48)	(-0.50)	(-0.43)	(-0.36)	(-0.38)
$collateral_t$	-0.01	-0.02	-0.01	-0.01	-0.02	-0.02
	(-0.11)	(-0.18)	(-0.12)	(-0.16)	(-0.21)	(-0.18)
$valpct$	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-0.63)	(-0.57)	(-0.64)	(-0.56)	(-0.38)	(-0.64)
$phda$	0.00	0.00	0.00	0.00	0.00	0.00
	(1.38)	(1.39)	(1.40)	(1.30)	(1.30)	(1.40)
$overval_t$	0.00	0.00	0.00	0.00	0.00	0.00*
	(1.15)	(1.29)	(1.26)	(1.33)	(1.04)	(1.67)
$overval_a$	-0.00	-0.00	-0.00	-0.00*	-0.00	-0.00
	(-1.41)	(-1.49)	(-1.56)	(-1.69)	(-1.46)	(-1.50)
$insthold$	0.18**	0.18**	0.18**	0.17**	0.20**	0.15*
	(2.17)	(2.21)	(2.15)	(2.13)	(2.45)	(1.86)
$insthold > 0$	-0.06	-0.08	-0.07	-0.07	-0.08	-0.08
	(-0.77)	(-0.92)	(-0.85)	(-0.88)	(-0.94)	(-0.99)
$HFhold(Factor_{low}) > 0$	-0.03	-0.01	-0.01	-0.01	-0.04	-0.08
	(-0.68)	(-0.27)	(-0.35)	(-0.14)	(-1.22)	(-1.53)
$HFhold(Factor_{high} > 0$	-0.01	-0.01	-0.01	-0.01	-0.01	0.10**
	(-0.32)	(-0.20)	(-0.42)	(-0.23)	(-0.32)	(2.29)
$HFhold(Factor_{low})$	0.58**	0.59**	0.72***	0.51**	2.25***	0.55**
	(2.55)	(2.32)	(2.91)	(2.14)	(3.43)	(2.42)
$HFhold(Factor_{high})$	0.57*	0.48	0.38	0.62**	0.46**	0.23
	(1.66)	(1.52)	(1.37)	(2.02)	(2.47)	(0.37)
$HFhold(Factor_{low}) \cdot overval_a$	-0.04*	-0.06*	-0.04	-0.11***	0.02	-0.04*
	(-1.91)	(-1.74)	(-1.58)	(-3.43)	(0.35)	(-1.89)
$HFhold(Factor_{high}) \cdot overval_a$	-0.08**	-0.06*	-0.07**	-0.01	-0.09***	-0.21**
	(-2.36)	(-1.94)	(-2.49)	(-0.25)	(-3.53)	(-2.49)
$insthold \cdot overval_a$	0.01	0.01	0.01	0.02*	0.01	0.01
	(1.11)	(1.17)	(1.24)	(1.65)	(1.56)	(1.42)
Constant	0.10	0.09	0.10	0.10	0.11	0.08
	(0.74)	(0.65)	(0.74)	(0.69)	(0.82)	(0.58)
sigma						
Constant	0.45***	0.45***	0.45***	0.44***	0.44***	0.44***
	(39.07)	(39.07)	(39.07)	(39.08)	(39.09)	(39.09)
Year and industry FE	yes	yes	yes	yes	yes	yes
Pseudo R-sq	0.20	0.20	0.20	0.20	0.21	0.20
Nobs	1829	1829	1829	1829	1829	1829

Table 17: Means of payment: stock detailed

The table reports the estimation results of a liner regression for the percentage of stock offered as payment. In each of the specifications, holdings of a specific group of HFs with a high value of a given characteristic are included as an additional factor ($HFhold(Factor_{high})$). The characteristics include: I - HF average portfolio turnover ($turn$), II- HF portfolio Herfindahl index ($Herf$), III - average residual volatility of the stocks held by the HF ($ResVol$), IV - HF alpha relative to the Fung and Hsieh [2004] 7 factors ($Alpha$), V - alpha t-statistic ($tstat$), VI - natural logarithm of HF portfolio size ($logPortSize$), VII - holdings of HFs which follow Event Driven, Multi-Strategy, and Relative Value Arbitrage styles ($EvDrHold$). *, **, *** indicate significance at the 10, 5, 1% level respectively. t-statistics are in brackets.

	(1)	(2)	(3)	(4)	(5)	(6)
	$turn$	$Herf$	$ResVol$	$Alpha$	$logPortSize$	$EvDrHold$
bm_t	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(-1.25)	(-1.31)	(-1.21)	(-1.21)	(-1.14)	(-1.29)
$saleg_t$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-1.34)	(-1.27)	(-1.31)	(-1.37)	(-1.38)	(-1.32)
cap_t	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(4.58)	(4.55)	(4.57)	(4.58)	(4.25)	(4.63)
$levmkt_t$	0.04	0.03	0.04	0.03	0.03	0.03
	(0.38)	(0.37)	(0.38)	(0.33)	(0.30)	(0.34)
$collateral_t$	-0.06	-0.05	-0.06	-0.05	-0.05	-0.05
	(-0.75)	(-0.65)	(-0.71)	(-0.68)	(-0.61)	(-0.62)
$valpct$	0.03	0.03	0.03	0.02	0.02	0.03
	(1.54)	(1.42)	(1.49)	(1.40)	(1.24)	(1.49)
$phda$	-0.00**	-0.00**	-0.00**	-0.00*	-0.00*	-0.00**
	(-1.97)	(-2.04)	(-1.98)	(-1.85)	(-1.86)	(-2.00)
$overval_t$	-0.00	-0.00*	-0.00	-0.00*	-0.00	-0.00**
	(-1.49)	(-1.74)	(-1.58)	(-1.75)	(-1.48)	(-2.05)
$overval_a$	0.00	0.00	0.00	0.00	0.00	0.00
	(1.09)	(1.12)	(1.20)	(1.33)	(1.06)	(1.13)
$insthold$	-0.21***	-0.21***	-0.21***	-0.22***	-0.24***	-0.20***
	(-2.84)	(-2.93)	(-2.84)	(-2.96)	(-3.28)	(-2.67)
$insthold > 0$	0.06	0.09	0.06	0.07	0.08	0.08
	(0.84)	(1.22)	(0.90)	(1.03)	(1.04)	(1.13)
$HFhold(Factor_{low}) > 0$	0.04	0.01	0.04	0.02	0.04	0.08*
	(1.16)	(0.27)	(1.06)	(0.66)	(1.48)	(1.67)
$HFhold(Factor_{high}) > 0$	0.01	0.00	0.00	0.00	0.03	-0.08**
	(0.47)	(0.07)	(0.10)	(0.02)	(0.69)	(-2.01)
$HFhold(Factor_{low})$	-0.68***	-0.79***	-0.60***	-0.47**	-2.23***	-0.65***
	(-3.23)	(-3.35)	(-2.62)	(-2.16)	(-3.57)	(-3.08)
$HFhold(Factor_{high})$	-0.61*	-0.29	-0.66**	-0.81***	-0.53***	-0.09
	(-1.88)	(-0.96)	(-2.57)	(-2.76)	(-3.12)	(-0.17)
$HFhold(Factor_{low}) \cdot overval_a$	0.02	0.03	0.02	0.05***	0.01	0.02
	(1.19)	(1.05)	(1.04)	(2.60)	(0.24)	(0.98)
$HFhold(Factor_{high}) \cdot overval_a$	0.05*	0.03	0.04*	-0.00	0.04**	0.09*
	(1.75)	(1.25)	(1.89)	(-0.12)	(2.20)	(1.65)
$insthold \cdot overval_a$	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
	(-0.11)	(-0.02)	(-0.17)	(-0.32)	(-0.08)	(0.04)
Constant	0.35***	0.38***	0.36***	0.35***	0.34***	0.37***
	(2.82)	(3.03)	(2.86)	(2.78)	(2.74)	(2.95)
sigma						
Constant	0.41***	0.41***	0.41***	0.41***	0.41***	0.41***
	(42.77)	(42.77)	(42.77)	(42.77)	(42.77)	(42.77)
Year and industry FE	yes	yes	yes	yes	yes	yes
Pseudo R-sq	0.19	0.19	0.19	0.19	0.19	0.19
Nobs	1829	1829	1829	1829	1829	1829

6 Conclusion

The impact of hedge fund on real economy has been attracting substantial attention in the academic literature in recent years. Much of research is focused on "activists" hedge funds. Those funds generally have a positive impact on the shareholder value, as they improve firms' efficiency through better monitoring of management. Such funds, however, are not the majority in the industry.

In this paper, we focus on funds with particularly short-term investment horizon or speculative nature. We find that those funds have a non-negligible impact on terms and conditions, and the outcomes of M&A deals, but that the impact varies across various groups of hedge funds. In particular, holdings of funds with low portfolio turnover, as well as highly concentrated holdings and historically high level of skills (alpha) increase the probability of deal completion.

In this paper, we focus on "non-activists", potentially short-term investors and their impact on M&A deals, which often attracts lots of attention in press. We find, that despite the fears, HF holdings do not destroy shareholder value, and are not associated with any changes in announcement returns of either a bidder or a target. HFs also do not seem to have any material impact on the probability of a deal completion. HF holdings increase the probability of a tender offer, but do so to the exactly the same extent as those of other institutional investors.

At the same time, HF involvement in M&As clearly decreases the period of negotiation, with the strongest decline for all stock deals.

Importantly, holdings of hedge funds in targets lead to higher percentage of cash offered and lower percentage of stock, consistent with preference for immediate liquidity of hedge funds. The strongest impact is associated with funds of smaller size and high historical alpha. Such funds are more likely to completely give up control right of the target firm. At the same time, many funds seem to have short-term investment horizon and are more willing to accept overvalued bidder stock than other institutional investors, consistent with the model of Shleifer and Vishny [2003]. In particular, funds that more actively manage their portfolios and hold concentrated portfolios with high residual volatility, or are of a large size are even less opposed to accepting overvalued bidder stock as payment. The strongest impact is associated with the

holdings of funds that are specializing in exploiting information regarding specific corporate events, such as Event Driven, Multi-Strategy, and Relative Value Arbitrage funds.

Our results suggest that while hedge funds do not impact the immediate changes of shareholder value of target firms, their preference for liquidity leads to stronger shift of the control rights in a joint firm to bidders.

References

Vikas Agarwal, W. E. I. Jiang, Yuehua Tang, and Baozhong Yang. Uncovering hedge fund skill from the portfolio holdings they hide. *The Journal of Finance*, 68(2):739–783, 2013.

George O. Aragon and J. Spencer Martin. A unique view of hedge fund derivatives usage: Safeguard or speculation? *Journal of Financial Economics*, 105(2):436–456, 2012.

Hadiye Aslan and Praveen Kumar. The product market effects of hedge fund activism. *Journal of Financial Economics*, 119(1):226–248, 2016.

Itzhak Ben-David, Francesco Franzoni, Augustin Landier, and Rabih Moussawi. Do hedge funds manipulate stock prices? *The Journal of Finance*, 68(6):2383–2434, 2013.

Sandra Betton, B. Espen Eckbo, R. E. X. Thompson, and Karin S. Thorburn. Merger negotiations with stock market feedback. *The Journal of Finance*, 69(4):1705–1745, 2014.

Andriy Bodnaruk and Marco Rossi. Dual ownership, returns, and voting in mergers. *Journal of Financial Economics*, 120(1):58–80, 2016.

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

Nicole M. Boyson, Nickolay Gantchev, and Anil Shivdasani. Activism mergers. *Working paper*, pages Northeastern U. D'Amore–McKim School of Business Research Paper No. 2677416, 2016.

Alon Brav, W. E. I. Jiang, Frank Partnoy, and Randall Thomas. Hedge fund activism, corporate governance, and firm performance. *The Journal of Finance*, 63(4):1729–1775, 2008.

Mike Burkart and Samuel Lee. Hedge fund activism vs. hostile takeover bids. *Working paper*, pages Swedish House of Finance Research Paper No. 15–04, 2015.

Charles Cao, Bing Liang, Andrew W. Lo, and Lubomir Petrasek. Hedge fund holdings and stock market efficiency. *FEDS Working Paper No. 2014-36.*, 2014.

Lorenzo Caprio, Ettore Croci, and Alfonso Del Giudice. Ownership structure, family control, and acquisition decisions. *Journal of Corporate Finance*, 17(5):1636–1657, 2011.

Mark M. Carhart. On persistence in mutual fund performance. *The Journal of Finance*, 52(1): 57–82, 1997.

Frederick D. S. Choi and Changwoo Lee. Merger premia and national differences in accounting for goodwill. *Journal of International Financial Management and Accounting*, 3(3):219–240, 1991.

Ming Dong, David Hirshleifer, Scott Richardson, and Siew Hong Teoh. Does investor misvaluation drive the takeover market? *The Journal of Finance*, 61(2):725–762, 2006.

Mara Faccio and Ronald W. Masulis. The choice of payment method in european mergers and acquisitions. *The Journal of Finance*, 60(3):1345–1388, 2005.

Eliezer M. Fich, Jarrad Harford, and Anh L. Tran. Motivated monitors: The importance of institutional investors portfolio weights. *Journal of Financial Economics*, 118(1):21–48, 2015.

William Fung and David A. Hsieh. Hedge fund benchmarks: A risk-based approach. *Financial Analysts Journal*, 60(5):65–80, 2004.

Nickolay Gantchev, Oleg Gredil, and Chotibhak Jotikasthira. Governance under the gun: Spillover effects of hedge fund activism. *Working paper*, 2016.

Xavier Giroud and Holger M. Mueller. Does corporate governance matter in competitive industries? *Journal of Financial Economics*, 95(3):312–331, 2010.

Xavier Giroud and Holger M. Mueller. Corporate governance, product market competition, and equity prices. *The Journal of Finance*, 66(2):563–600, 2011.

John M. Griffin and Jin Xu. How smart are the smart guys?: A unique view from hedge fund stock holdings. *Review of Financial Studies*, 22(7):2531–2570, 2009. doi: 10.1093/rfs/hhp026.

James E. Hodder, Jens C. Jackwerth, and Olga Kolokolova. Recovering delisting returns of hedge funds. *Journal of Financial and Quantitative Analysis*, 49(3):797815, 2014.

Michael C. Jensen. Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76(2):323–329, 1986.

Michael C. Jensen and Richard S. Ruback. The market for corporate control. *Journal of Financial Economics*, 11(1):5–50, 1983.

E. Han Kim and Paige Ouimet. Broad-based employee stock ownership: Motives and outcomes. *The Journal of Finance*, 69(3):1273–1319, 2014.

April Klein and Emanuel Zur. The impact of hedge fund activism on the target firm's existing bondholders. *Review of financial studies*, 24(5):1735–1771, 2011.

Larry H. P. Lang, RenéM Stulz, and Ralph A. Walkling. A test of the free cash flow hypothesis. *Journal of Financial Economics*, 29(2):315–335, 1991.

M. C. Lee, Charles, James Myers, and Bhaskaran Swaminathan. What is the intrinsic value of the dow? *The Journal of Finance*, 54(5):1693–1741, 1999.

Weimin Liu. A liquidity-augmented capital asset pricing model. *Journal of Financial Economics*, 82(3):631–671, 2006.

Henry G. Manne. Mergers and the market for corporate control. *Journal of Political Economy*, 73(2):110–120, 1965.

Kenneth J. Martin. The method of payment in corporate acquisitions, investment opportunities, and management ownership. *The Journal of Finance*, 51(4):1227–1246, 1996.

Achim Mattes. Hedge fund herding. *Working Paper*, 2011.

Mark Mitchell, Todd Pulvino, and Erik Stafford. Price pressure around mergers. *The Journal of Finance*, 59(1):31–63, 2004.

Sara B. Moeller, Frederik P. Schlingemann, and René M. Stulz. Firm size and the gains from acquisitions. *Journal of Financial Economics*, 73(2):201–228, 2004.

Randall Morck, Andrei Shleifer, and Robert W. Vishny. Do managerial objectives drive bad acquisitions? *The Journal of Finance*, 45(1):31–48, 1990.

Amrita Nain and Tong Yao. Mutual fund skill and the performance of corporate acquirers. *Journal of Financial Economics*, 110(2):437–456, 2013.

Micah S. Officer. Termination fees in mergers and acquisitions. *Journal of Financial Economics*, 69(3):431–467, 2003.

Krishna G. Palepu. Predicting takeover targets. *Journal of Accounting and Economics*, 8(1): 3–35, 1986.

Frederik P. Schlingemann. Financing decisions and bidder gains. *Journal of Corporate Finance*, 10(5):683–701, 2004.

Andrei Shleifer and Robert W. Vishny. Stock market driven acquisitions. *Journal of Financial Economics*, 70(3):295–311, 2003.

Jin Xu and Yinghua Li. Hedge fund activism and bank loan contracting. *Working paper*, pages Virginia Tech – Pamplin College of Business, 2010.